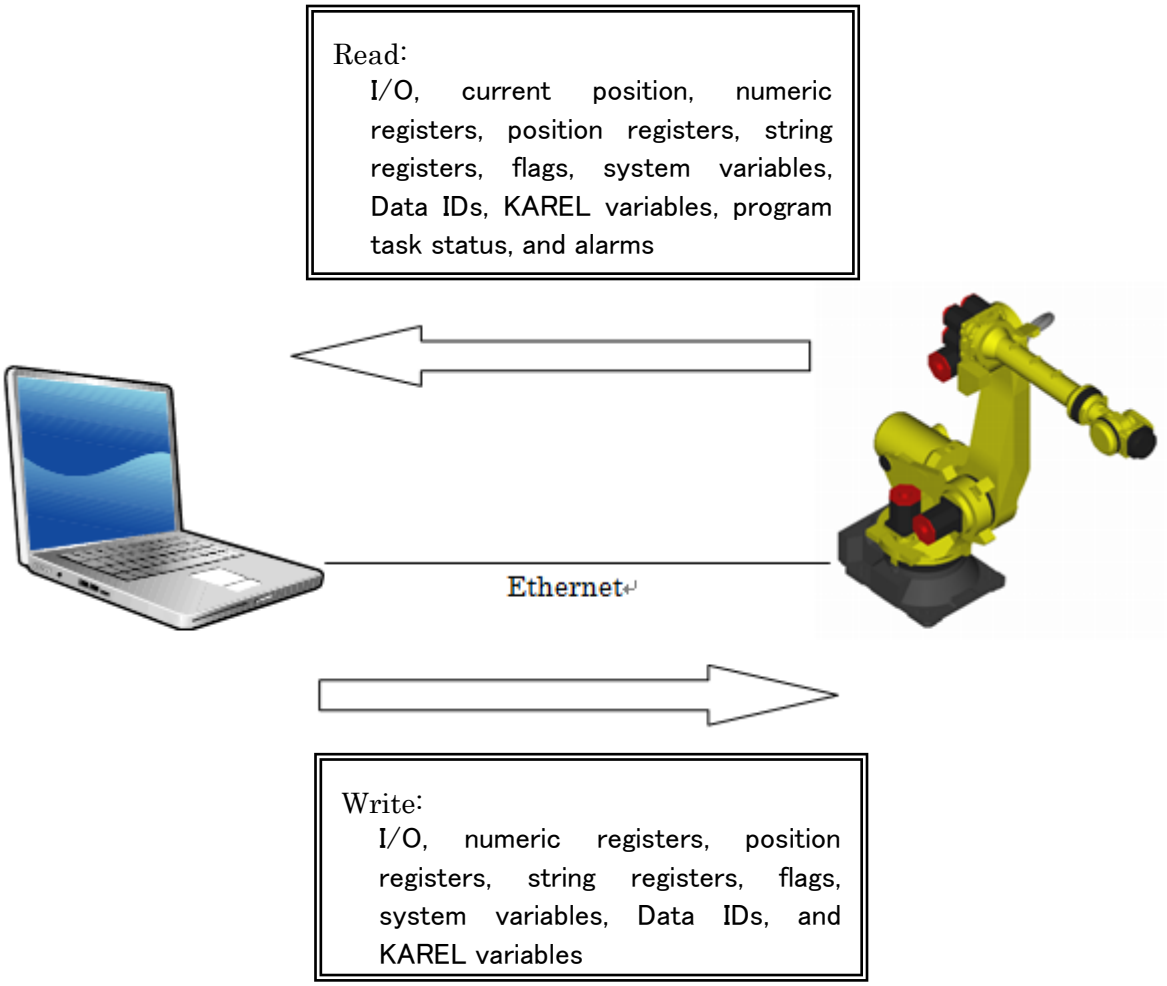
1 Overview

FANUC Robot Interface is Windows software module to read/write robot data with robot over Ethernet.



(*) FANUC Robot Interface does not support file transferring. Please use FTP or HTTP for it.

FANUC Robot Interface is a .NET Framework module. (RobotInterfaceDotNet.dll, bridgeRobotIF.dll) This document describes software interface of it.
FRRJIF.Core or bridgeCore object provide methods to read/write robot I/O. It is possible to read/write area of integrated PMC.

For accessing current position, position registers, string registers, flags, comments, system variables, Data IDs, KAREL variables, program status and alarm history, it is necessary to add needed data to DataTable object (FRRJIF.Core.DataTable or bridgeDataTable) at first. FRRJIF reads all of DataTable object at a time. It is called 'Refresh'. Read values are kept until next refresh.
(*) DataTable for reducing read data by accessing data at a time.

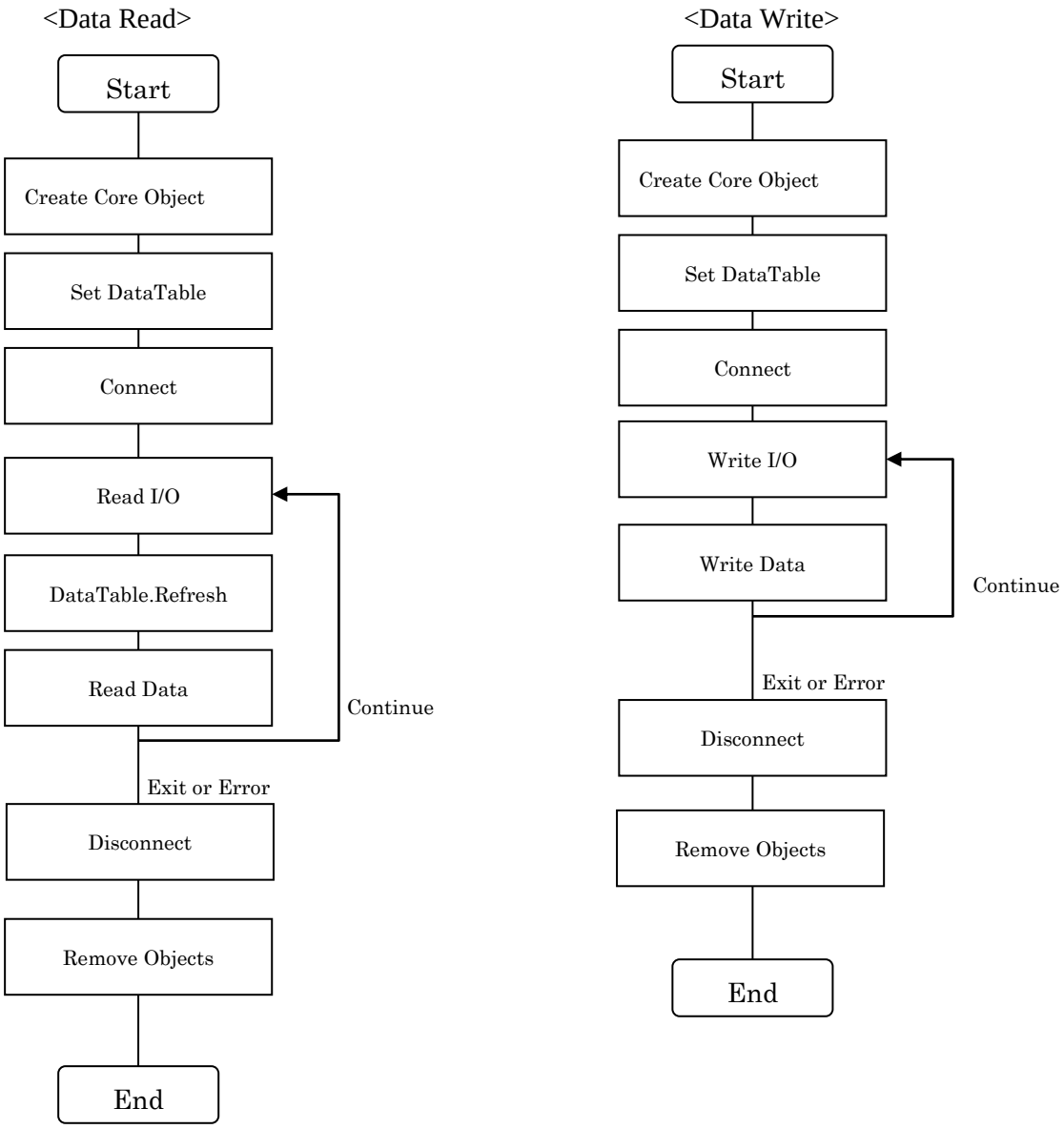
A robot cannot have more than a limited number of the concurrent connections. Attempting to connect with multiple computers or applications beyond the maximum number of the concurrent connections will fail.
(*) 7DA3/06 or later and 7DA4 or later can have up to 4 connections per robot.
(*) 7DA3/05 or earlier can only have 1 connection per robot.

You need to purchase one FANUC Robot Interface (A08B-9410-J575) to one development PC. For additional PCs that are not for development, you do not need to purchase additional FANUC Robot Interface. License registration and USB protector is not necessary from V3.0.0.

FANUC Robot Interface does not have file transfer functions. You can use FTP to transfer files between PC and robot.

bridgeRobotIF.dll is a wrapper class for Visual C++.

− Basic Flow



(*) When communication is terminated, communication error or time out occurs, please remove all robot interface objects. It is necessary to create objects in order to start communication again.

(*) The data reading is a kind of polling procedure for monitoring. It is not possible to get all data transition since robot interface applications can read data periodically.

2 Environment

OS:

Windows 7(32bit), Windows 7(64bit)
Windows 8.1(32bit), Windows 8.1(64bit)
Windows 10(32bit), Windows 10(64bit)
Windows 11

Development language:

Microsoft Visual Basic 2013, 2015, 2017, 2019, 2022
Microsoft Visual C++ 2013, 2015, 2017, 2019, 2022
Microsoft Visual C# 2013, 2015, 2017, 2019, 2022

Microsoft .NET Framework:

.NET Framework 4.0 or later

Robot Controllers:

R-J3iB 7D80/45 or later
R-J3iB 7D81/09 or later
R-J3iB 7D82/01 or later
R-J3iB Mate 7D91/01 or later
R-30iA, R-30iA Mate All Versions (*1)
R-30iB, R-30iB Mate All Versions (*1)
R-30iB Plus, R-30iB Mate Plus, R-30iB Compact Plus, R-30iB Mini Plus All Versions (*1)
R-50iA, R-50iA Mate All Versions (*1)

ROBOGUIDE: (*2)

ROBOGUIDE V7 Rev.F(7N06) or later
Virtual Robot R-30iA 7DA5/15 or later
Virtual Robot R-30iA 7DA7/13 or later
Virtual Robot R-30iB All Versions
Virtual Robot R-30iB Plus All Versions
Virtual Robot R-50iA All Versions

PC must communicate with robot over Ethernet. (Noise must not stop the communication. Correct security settings are needed.)

(*1) If R650 FRA Params is selected, R553 "HMI Device (SNPX)" is needed. If R651 FRL Params is selected, no option is needed.

(*2) Please refer "6. Connect To ROBOGUIDE".

(*) Please refer "Ethernet Function Operator's Manual" of robot controller.

3 Limitations

When you update FANUC Robot Interface, you may need to re-compile your application that uses FANUC Robot Interface.

Robot interface communication response time is not guaranteed. Communication environment, robot status and PC status may affect response time. Enough long time out value (FRRJIF.Core.TimeOutValue) is recommended.

If noise affects the communication, robot interface may not work. For example, robot interface might not work correctly during robot working. You need to shield Ethernet cables or set apart cables from noise source. (Please refer Appendix "Network design and performance", "Cable connection" of Ethernet function operator's manual.)

When communication error or time out occur, please disconnect the connection and delete all FRRJIF objects. If you need to connect again, please re-create objects.

When amount of data or the number of send data is large, it may be necessary long time. If you need fast communication, please reduce amount of data or the number of send data.

Reading nonexistent data (for example, reading nonexistent system variable) does not return error. Writing nonexistent data does not return error. Such writings are ignored.

Robot interface does not work correctly on multiple thread programming.

4 New Features

4.1 V3.0.5 New features

- Supported Data IDs.
  Please refer to FRRJIF.DataTable.AddSysDataId, FRRJIF.DataTable.AddSysDataIdPos, FRRJIF.DataSysDataId, and FRRJIF.DataSysDataIdPos

4.2 V3.0.4 New features

- Supported Visual Studio 2022.
- Extended the supported range of safe peripheral input from SPI[1-8] to SPI[1-128].
  Please refer to FRRJIF.VirtualRobotSafetyIOHelper and FRRJIF.VirtualRobotSpi.

4.3 V3.0.3 New features

- Supported Visual Studio 2019.
- Supported Flags.
  Please refer to FRRJIF.DataTable.AddFlag and FRRJIF.DataFlag.
- Supported Safety I/O (SPI, CSI) of virtual robot.
  Please refer to FRRJIF.VirtualRobotSafetyIOHelper, FRRJIF.VirtualRobotSpi, and FRRJIF.VirtualRobotCsi.

4.4 V3.0.2 New features

- Added the procedures for starting a program by using robot interface.
  Please refer to "Automatic Operation"

4.5 V3.0.1 New features

- Initial version.

5 Object Reference

5.1 Symbols

VB	Visual Basic 2013, 2015, 2017, 2019 and 2022
VC++	Visual C++ 2013, 2015, 2017, 2019 and 2022
C#	Visual C# 2013, 2015, 2017, 2019 and 2022

5.2 FRRJIF.Core

5.2.1 Methods

- Connect Methods
  Connect, Disconnect, TimeOutValue
- IO Methods
  ReadSDI, ReadSDO, ReadRDI, ReadRDO, ReadSI, ReadSO, ReadUI, ReadUO, ReadGI, ReadGO, WriteSDI, WriteSDO, WriteRDO, WriteSO, WriteUO, WriteGI, WriteGO
- DataTable Methods
  DataTable, DataTable2
- Alarm Methods
  ClearAlarm

(*) Please specify character encoding when generating an object of FRRJIF.Core. If encoding is not specified, default encoding of execute machine is used.

(*) Please specify string as argument of bridgeCommon::setEncode to specify character encoding, if VC++ using by bridgeRobotIF.dll. For example, specify “Shift-Jis” as string, if specifying shiftjis. After that, object of System.Text.Encoding is obtained by bridgeCommon::getEncode.

5.2.1.1 Connect – Connect to a robot

VB:	Function Connect(ByVal HostName As String) As Boolean
VC++:	int Connect(String HostName);
C#	bool Connect(string *HostName*)

Specify robot host name (or IP address) as argument.
You need to initialize DataTable before calling this method.

Success returns True, fails returns False.

5.2.1.2 Disconnect – Disconnect from a robot

VB:	Function Disconnect() As Boolean
VC++:	BOOL Disconnect();
C#	bool Disconnect()

Success returns True, fails returns False.

(*) When disconnected, please delete all FRRJIF objects. If you need to connect again, please re-create objects.

5.2.1.3 TimeOutValue – Time out value

VB:	get_TimeOutValue As Integer set_TimeOutValue(Byval newValue As Integer) or TimeOutValue property
VC++:	Int get_TimeOutValue(); void put_TimeOutValue(int newValue);
C#	int get_TimeOutValue() void set_TimeOutValue(int newValue) or TimeOutValue property

This is time out value for communication error. Default value is 10000 (ms). Minimum value is 100. If you apply small time out value, then you may encounter time out often. The time out value is discard at deleting Core object. Please specify time out again when Core object is created.

(*) When timeout, please disconnect and delete all FRRJIF objects. If you need to connect again, please re-create objects.

5.2.1.4 ReadSDI, ReadSDO, ReadRDI, ReadRDO, ReadSI, ReadSO, ReadUI, ReadUO, ReadGI, ReadGO – Read I/O

VB:	Function ReadXXX(ByVal Index As Integer, ByRef Buffer As System.Array, ByVal Count As Integer) As Boolean
VC++:	int bridgeLibCore.ReadXXX(short Index, array<short>^ bufArray, int Cnt);
C#	bool ReadXXX(int *Index*, ref System.Array *Buffer*, int *Count*)

（XXX is one of SDI, SDO, RDI, RDO, SI, SO, UI or UO）

VB:	Function ReadXX(ByVal Index As Integer, ByRef Buffer As System.Array, ByVal Count As Integer) As Boolean
VC++	long bridgeLibCore.ReadXX(short Index, array<int>^ bufArray, int Cnt)
C#	bool ReadXX(int *Index*, ref System.Array *Buffer*, int *Count*)

（XX is one of GI or GO）

This method is to read a series of I/O.
Specify the first index of referred I/O, integer (or Long) array to store values and the number of referred I/O as arguments.

In integrated PMC R-30iA or before:
- You can read integrated PMC K area (SDO[10001] or later) and R area (SDO[11001] or later) with ReadSDO method. However, you cannot read both K area and R area at a time. You need to read K area and R area separately.
- You can read integrated PMC D area (GO[10001] or later) with ReadGO method. However, you cannot read both normal GO and D area at a time. You need to read normal GO and D area separately.

In R-30*i*B and R-30iB Plus, the PMC data, SDO[10001-] (K area), SDO[11001-] (R area) and GO[10001-] (D area), cannot be accessed by default. By using the compatibility setup function, the PMC data, K0-K17, R0-R1499 and D0-D2999, can be accessed as the same as the conventional model. However, a part of PMC function is restricted by the compatibility setup function.
To exchange the data between Robot Interface and PMC in R-30*i*B and R-30iB Plus, please setup PMC internal I/O assignment to assign F of PMC to DO of Robot, or G of PMC to DI of Robot. For example,

when the following setting is done, the 32 points signal of DO[1-32] of Robot are assigned to the 4 byte PMC signal address of F0-F3 in 1st path PMC. Robot Interface can access F0-F3 by accessing DO[1-32].

Robot data				Size	Address
1	DO[	1-	32]	4	1:F00000

You can read WI with ReadSDI method. You need to add 8000 to the index. For example, you need to specify 8001 in order to access WI[1].
You can read WSI with ReadSDI method. You need to add 8400 to the index. For example, you need to specify 8401 in order to access WSI[1].
You can read WO with ReadSDO method. You need to add 8000 to the index. For example, you need to specify 8001 in order to access WO[1].
You can read AI with ReadGI method. You need to add 1000 to the index. For example, you need to specify 1001 in order to access AI[1].
You can read AO with ReadGO method. You need to add 1000 to the index. For example, you need to specify 1001 in order to access AO[1].

Success returns True, fails returns False in Visual Basic, C# cases. Success returns 1, fails returns 0 in Visual C++ cases. (When accessed non-exist I/O, this method returns True. In the case, the values are 0.)

<Example> Read SDI[1] to SDI[5]

```
Dim intBuffer(0 to 4) As Integer
Dim blnResult As Boolean

blnResult = objCore.ReadSDI(1, intBuffer(), 5)
```

(*) You had better read a series of I/O at a time to reduce access time.

(*) Long array is needed to GI, GO.

5.2.1.5 WriteSDI, WriteSDO, WriteRDO, WriteSO, WriteUO, WriteGI, WriteGO – Write I/O

VB:	Function WriteXXX(ByVal Index As Integer, ByRef Buffer As System.Array, ByVal Count As Integer) As Boolean
VC++:	long bridgeLibCore.WriteXXX(short Index, array<short>^ bufArray, int Cnt);
C#	bool WriteXXX(int *Index*, ref System.Array *Buffer*, int *Count*)

（XXX is one of SDI, SDO, RDO, SO or UO）

VB:	Function WriteXX(ByVal Index As Integer, ByRef Buffer As System.Array, ByVal Count As Integer) As Boolean
VC++:	long bridgeLibCore.WriteXX(short Index, array<int>^ bufArray, int Cnt)
C#	WriteXX(int *Index*, ref System.Array *Buffer*, int *Count*)

（XX is one of GI or GO）

This method is to write a series of I/O at a time.
Specify the first index of written I/O, integer (or Long) array to store values and the number of referred I/O as arguments.

In integrated PMC R-30iA or before:
- You can write integrated PMC K area (SDO[10001] or later) and R area (SDO[11001] or later) with WriteSDO method. However, you cannot write both K area and R area at a time. You need to write K

area and R area separately.
- You can write integrated PMC D area (GO[10001] or later) with ReadGO method. However, you cannot write both normal GO and D area at a time. You need to write normal GO and D area separately.
You can write WO with WriteSDO method. You need to add 8000 to the index. For example, you need to specify 8001 in order to access WO[1].

In R-30*i*B and R-30iB Plus, the PMC data, SDO[10001-] (K area), SDO[11001-] (R area) and GO[10001-] (D area), cannot be accessed by default. By using the compatibility setup function, the PMC data, K0-K17, R0-R1499 and D0-D2999, can be accessed as the same as the conventional model. However, a part of PMC function is restricted by the compatibility setup function.
To exchange the data between Robot Interface and PMC in R-30*i*B and R-30iB Plus, please setup PMC internal I/O assignment to assign F of PMC to DO of Robot, or G of PMC to DI of Robot. For example, when the following setting is done, the 32 points signal of DO[1-32] of Robot are assigned to the 4 byte PMC signal address of F0-F3 in 1st path PMC. Robot Interface can access F0-F3 by accessing DO[1-32].

Robot data				Size	Address
1	DO[	1-	32]	4	1:F00000

You can Write AO with WriteGO method. You need to add 1000 to the index. For example, you need to specify 1001 in order to access AO[1].

Success returns True, fails returns False in Visual Basic, C# cases. Success returns 1, fails returns 0 in Visual C++ cases. (When accessed non-exist I/O, this method returns True. In the case, this method writes nothing.)

<Example> Set SDO[1] to SDO[5] to On
```
Dim intBuffer(0 to 4) As Integer
Dim blnResult As Boolean

intBuffer(0) = 1
intBuffer(1) = 1
intBuffer(2) = 1
intBuffer(3) = 1
intBuffer(4) = 1
blnResult = objCore.WriteSDO(1, intBuffer(), 5)
```

(*) You had better write a series of I/O at a time to reduce access time.

(*) Long array is needed to GI, GO.

(*) SDI and GI should be simulated for writing.

5.2.1.6 DataTable – Get DataTable object

VB:	FRRJIf.DataTable get_DataTable()
VC++:	bridgeDataTable^ get_DataTable();
C#	FRRJIf.DataTable get_DataTable() or DataTable property

This method returns FRRJIF.DataTable object.

5.2.1.7 DataTable2 – Get Second DataTable object

VB:	FRRJIf.DataTable get_DataTable2()

VC++:	bridgeDataTable^ get_DataTable2();
C#	FRRJIf.DataTable get_DataTable2()or DataTable2 property

This method returns FRRJIF.DataTable object.
The first data table from DataTable method and the second data table from DataTable2 method have the same function. It is possible to refresh the tables separately. It allows you to handle two data group that refresh rate is different

(*) It is necessary to get DataTable2 after all AddXXX method for the first data table finish. When you get second data table, you cannot call AddXXX for the first data table.

5.2.1.8 ClearAlarm – Clear alarms

VB:	Function ClearAlarm() As Boolean
VC++:	BOOL ClearAlarm(long vlngType);
C#	bool ClearAlarm(int *vlngType*)

Clear alarm history.

For Visual C++, pass 0 as vlngType. Success returns True, fails returns False.

Remark
(*) When communication fails like timeout, please disconnect and delete all FRRJIF objects. If you need to connect again, please re-create objects.

5.3 FRRJIF.DataTable

5.3.1 Methods

- Data register methods
  Clear, AddCurPosUF, AddNumReg, AddPosReg, AddPosRegXyzwpr, AddPosRegMG, AddSysVar, AddSysVarPos, AddSysDataId, AddSysDataIdPos, AddTask, AddAlarm, AddString, AddFlag
- Data read method
  Refresh

5.3.1.1 Clear – Clear DataTable

VB:	Function Clear() As Boolean
VC++:	BOOL Clear();
C#	bool Clear()

You must not call Clear method after connecting.
Success returns True, fails returns False.

5.3.1.2 AddCurPosUF – Register 'Current position with user frame' data to DataTable

VB:	Function AddCurPosUF(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal Group As Integer, ByVal UF As Integer) As FRRJIf.DataCurPos
VC++:	bridgeDataCurPos AddCurPosUF(FRRJIf.FRIF_DATA_TYPE DataType, int Group, int UF);
C#	FRRJIf.DataCurPos AddCurPosUF(FRRJIf.FRIF_DATA_TYPE *DataType*, int *Group*, int *UF*)

Specify DataType(CURPOS=3), motion group number and user frame number as arguments.

When it succeeds, this method returns DataCurPos object. When it fails, this method returns Nothing. DataCurPos object is to read current position with specified user frame number. The user frame number zero means world position. The following user frame number means current frame number.

7DA4（V7.40）before	UF=15
7DA4/P01 – 7DA4/P11	UF=63
7DA4/P12 or later	UF=-1

<Example> Register current position of motion group 1 with user frame 1.

```
Dim objDataCurPos As DataCurPos

Set objDataCurPos = objCore.DataTable.AddCurPosUF(CURPOS, 1, 1)
```

5.3.1.3 AddNumReg – Register numeric registers to DataTable

VB:	Function AddNumReg(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal StartIndex As Integer, ByVal EndIndex As Integer) As FRRJIf.DataNumReg
VC++:	bridgeDataNumReg AddNumReg(FRRJIf.FRIF_DATA_TYPE DataType, int StartIndex, int EndIndex);
C#	FRRJIf.DataNumReg AddNumReg(FRRJIf.FRIF_DATA_TYPE *DataType*, int *StartIndex*, int *EndIndex*)

Specify DataType(NUMREG_INT=0 for integer case, NUMREG_REAL=1 for float case) , the first and end index of numeric registers.
When NUMREG_INT is specified, float values are translated to integer. When NUMREG_REAL is specified, integer values are translated to float.

When it succeeds, this method returns DataNumReg object. When it fails, this method returns Nothing. DataNumReg object is to read/write numeric register values.

<Example> Register R[1] to R[15]

```
Dim objDataNumReg As DataNumReg

Set objDataNumReg = objCore.DataTable.AddNumReg(NUMREG_INT, 1, 15)
```

5.3.1.4 AddPosReg – Register position registers to DataTable

VB:	Function AddPosReg(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal Group As Integer, ByVal StartIndex As Integer, ByVal EndIndex As Integer) As FRRJIf.DataPosReg

VC++:	bridgeDataPosReg AddPosReg(FRRJIf.FRIF_DATA_TYPE DataType, int Group, int StartIndex, int EndIndex);
C#	FRRJIf.DataPosReg AddPosReg(FRRJIf.FRIF_DATA_TYPE *DataType*, int *Group*, int *StartIndex*, int *EndIndex*)

Specify DataType(POSREG=2) , motion group number, the first and end index of position registers.

When it succeeds, this method returns DataPosReg object. When it fails, this method returns Nothing. DataPosReg object is to read/write position register values.

<Example> Register PR[1] to PR[10] of motion group 1.
Dim objDataPosReg As DataPosReg

Set objDataPosReg = objCore.DataTable.AddPosReg(POSREG, 1, 1,10)

5.3.1.5 AddPosRegXyzwpr – Register position registers to DataTable

VB:	Function AddPosRegXyzwpr(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal Group As Integer, ByVal StartIndex As Integer, ByVal EndIndex As Integer) As FRRJIf.DataPosRegXyzwpr
VC++:	bridgeDataPosRegXyzwpr AddPosRegXyzwpr(FRRJIf.FRIF_DATA_TYPE DataType, int Group, int StartIndex, int EndIndex);
C#	FRRJIf.DataPosRegXyzwpr AddPosRegXyzwpr(FRRJIf.FRIF_DATA_TYPE *DataType*, int *Group*, int *StartIndex*, int *EndIndex*)

Specify DataType(POSREG_XYZWPR=12) , motion group number, the first and end index of position registers.

When it succeeds, this method returns DataPosRegXyzwpr object. When it fails, this method returns Nothing. DataPosRegXyzwpr object is to write position register values fast.

<Example> Register PR[1] to PR[10] of motion group 1.
Dim objDataPosRegXyzwpr As DataPosRegXyzwpr

Set objDataPosRegXyzwpr = objCore.DataTable.AddPosRegXyzwpr (POSREG_XYZWPR, 1, 1,10)

5.3.1.6 AddPosRegMG – Register position registers(multiple group) to DataTable

VB:	Function AddPosRegMG(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal Group As String, ByVal StartIndex As Integer, ByVal EndIndex As Integer) As FRRJIf.DataPosRegMG
VC++:	bridgeDataPosRegMG AddPosRegMG(FRRJIf.FRIF_DATA_TYPE DataType, String Group, int StartIndex, int EndIndex);
C#	FRRJIf.DataPosReg AddPosReg(FRRJIf.FRIF_DATA_TYPE *DataType*, String *Group*, int *StartIndex*, int *EndIndex*)

Specify DataType(POSREGMG=36) , a string to specify motion group, the first and end index of position registers.

The string to specify motion group is each motion group strings (“C” for Cartesian, “J#” for joint) that are connected with comma.

When it succeeds, this method returns DataPosRegMG object. When it fails, this method returns Nothing. DataPosRegMG object is to read/write position register values fast.

<Example> Register PR[1] to PR[10]. Motion group 1 is Cartesian. From motion group 2 to 5 are joint 1 axis
Dim objDataPosRegMG As DataPosRegMG

Set objDataPosRegMG = objCore.DataTable.AddPosRegMG(POSREGMG, “C,J1,J1,J1,J1”, 1,10)

5.3.1.7 AddSysVar – Register system variables (integer, real and string type) to DataTable

VB:	Function AddSysVar(DataType As FRIF_DATA_TYPE, SysVarName As String) As DataSysVar
VC++:	bridgeDataSysVar AddSysVar(FRRJIf.FRIF_DATA_TYPE DataType, String SysVarName);
C#	FRRJIf.DataSysVar AddSysVar(FRRJIf.FRIF_DATA_TYPE *DataType*, string *SysVarName*)

Specify DataType(SYSVAR_INT=5 for integer case, SYSVAR_REAL=6 for float case, SYSVAR_STRING=8 for string case) and system variable name.
You need to specify "$[KAREL_PROGRAM]KAREL_VARIABLE" for KAREL variable cases. For example, you need to specify "$[HTTPKCL]CMDS[1]" for $CMDS[1] of HTTPKCL.

When it succeeds, this method returns DataSysVar object. When it fails, this method returns Nothing. DataSysVar object is to access system variable and KAREL variable.

<Example> Register $FAST_CLOCK
Dim objDataSysVar As DataSysVar

Set objDataSysVar = objCore.DataTable.AddSysVar(SYSVAR_INT, “$FAST_CLOCK”)

(*) System variables cannot be referenced in R-50iA or later. Please use AddSysDataId to reference Data IDs.

(*) When the string type is specified, the maximum number of characters that can be obtained and set is 80. If the number of characters is over 80, only first 80 characters can be obtained and set.

5.3.1.8 AddSysVarPos – Register system variables (position type) to DataTable

VB:	Function AddSysVarPos(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal SysVarName As String) As FRRJIf.DataSysVarPos
VC++:	bridgeDataSysVarPos AddSysVarPos(FRRJIf.FRIF_DATA_TYPE DataType,

	String SysVarName);
C#	FRRJIf.DataSysVarPos AddSysVarPos(FRRJIf.FRIF_DATA_TYPE *DataType*, string *SysVarName*)

Specify DataType(SYSVAR_POS=7) and system variable name.
You need to specify "$[KAREL_PROGRAM]KAREL_VARIABLE" for KAREL variable cases. For example, you need to specify "$[HTTPKCL]CMDS[1]" for $CMDS[1] of HTTPKCL.

When succeeded, this method returns DataSysVarPos object. When failed, this method returns Nothing. DataSysVarPos object is to access position type system variable and KAREL variable.

<Example> Register $MNUTOOL[1,1]
Dim objDataSysVarPos As DataSysVarPos

Set objDataSysVarPos = objCore.DataTable.AddSysVarPos(SYSVAR_POS, "$MNUTOOL[1,1]")

(*) System variables cannot be referenced in R-50iA or later. Please use AddSysDataIdPos to reference Data IDs.

5.3.1.9 AddSysDataId – Register Data IDs (integer, real and string type) to DataTable

VB:	Function AddSysDataId(DataType As FRIF_DATA_TYPE, DataIdName As String) As DataSysDataId
VC++:	bridgeDataSysDataId AddSysDataId(FRRJIf.FRIF_DATA_TYPE DataType, String DataIdName);
C#	FRRJIf.DataSysDataId AddSysDataId(FRRJIf.FRIF_DATA_TYPE *DataType*, string *DataIdName*)

Specify DataType(DATAID_INT=38 for integer case, DATAID_REAL=39 for float case, DATAID_STRING=41 for string case) and Data ID name.
You need to specify "$[KAREL_PROGRAM]KAREL_VARIABLE" for KAREL variable cases. For example, you need to specify "$[HTTPKCL]CMDS[1]" for $CMDS[1] of HTTPKCL.

When it succeeds, this method returns DataSysDataId object. When it fails, this method returns Nothing. DataSysDataId object is to access Data ID and KAREL variable.

<Example> Register $TOOLFRAME.ACTIVE_NUM[1]
Dim objDataSysDataId As DataSysDataId

Set objDataSysDataId = objCore.DataTable.AddSysDataId(DATAID_INT, "$TOOLFRAME.ACTIVE_NUM[1]")

(*) When the string type is specified, the maximum number of characters that can be obtained and set is 80. If the number of characters is over 80, only first 80 characters can be obtained and set.

5.3.1.10 AddSysDataIdPos – Register Data IDs (position type) to DataTable

VB:	Function AddSysDataIdPos(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal DataIdName As String) As FRRJIf.DataSysDataIdPos

VC++:	bridgeDataSysDataIdPos AddSysDataIdPos(FRRJIf.FRIF_DATA_TYPE DataType, String DataIdName);
C#	FRRJIf.DataSysDataIdPos AddSysDataIdPos(FRRJIf.FRIF_DATA_TYPE *DataType*, string *DataIdName*)

Specify DataType(DATAID_POS=40) and Data ID name.
You need to specify "$[KAREL_PROGRAM]KAREL_VARIABLE" for KAREL variable cases. For example, you need to specify "$[HTTPKCL]CMDS[1]" for $CMDS[1] of HTTPKCL.

When succeeded, this method returns DataSysDataIdPos object. When failed, this method returns Nothing. DataSysDataIdPos object is to access position type Data ID and KAREL variable.

<Example> Register $TOOLFRAME.FRAME[1,1]
Dim objDataSysDataIdPos As DataSysDataIdPos

Set objDataSysDataIdPos = objCore.DataTable.AddSysDataIdPos(DATAID_POS, "$TOOLFRAME.FRAME[1,1]")

5.3.1.11 AddTask – Register program execution status to DataTable

VB:	Function AddTask(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal Index As Integer) As FRRJIf.DataTask
VC++:	bridgeDataTask AddTask(FRRJIf.FRIF_DATA_TYPE DataType, int Index)
C#	FRRJIf.DataTask AddTask(FRRJIf.FRIF_DATA_TYPE *DataType*, int *Index*)

Specify DataType and task number. DataType should be one of the followings.

DataType	Meaning
TASK(=4)	Return executing program name and line number. (Original)
TASK_IGNORE_MACRO (=33)	If executing program is a macro program, return caller program name and line number instead of the macro program. If all caller programs are macro, program name is"" and line number is zero.
TASK_IGNORE_KAREL (=34)	If executing program is a KAREL program, return caller program name and line number instead of the KAREL program. If all caller programs are KAREL, program name is"" and line number is zero.
TASK_IGNORE_MACRO_KAREL (=35)	If executing program is a macro or KAREL program, return caller program name and line number instead of the macro or KAREL program. If all caller programs are macro or KAREL, program name is"" and line number is zero.

(*) If you would like to ignore macro program or KAREL program, you specify TASK_IGNORE_MACRO, TASK_IGNORE_KAREL or TASK_IGNORE_MACRO_KAREL.

(*) You can use TASK_IGNORE_MACRO, TASK_IGNORE_KAREL and TASK_IGNORE_MACRO_KAREL for robot controller 7DA7/24 or later.

When two tasks run in the multiple task system, task number 1 is to access the first one, task number 2 is to access second one. A task keeps the task number when executing.

When it succeeds, this method returns DataTask object. When it fails, this method returns Nothing. DataTask object is to read program execution status.

<Example> Register task number 1
Dim objDataTask As DataTask

Set objDataTask = objCore.DataTable.AddTask(TASK, 1)

5.3.1.12 AddAlarm – Register alarm history to DataTable

VB:	Function AddAlarm(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal AlarmCount As Integer, Optional ByVal AlarmMessageMode As Integer = 0) As FRRJIf.DataAlarm
VC++:	bridgeDataAlarm AddAlarm(FRRJIf.FRIF_DATA_TYPE DataType, int AlarmCount, int AlarmMessageMode);
C#	FRRJIf.DataAlarm AddAlarm(FRRJIf.FRIF_DATA_TYPE *DataType*, int *AlarmCount*, int *AlarmMessageMode*)

Specify DataType is ALARM_CURRENT(=10) for active alarm reference, DataType is ALARM_LIST(=9) for alarm history reference and the number of alarm items from top. Specify AlarmMessageMode is 0 in Visual C++.

When it succeeds, this method returns DataAlarm object. When it fails, this method returns Nothing. DataAlarm object is to read alarm history.

<Example> register five alarm items
Dim objDataAlarm As DataAlarm

Set objDataAlarm = objCore.DataTable.AddAlarm(ALARM_LIST, 5)

5.3.1.13 AddString – Register string data to DataTable

VB:	Function AddString(ByVal DataType As FRRJIf.FRIF_DATA_TYPE, ByVal StartIndex As Integer, ByVal EndIndex As Integer) As FRRJIf.DataString
VC++:	bridgeDataString AddString(FRRJIf.FRIF_DATA_TYPE DataType, int StartIndex, int EndIndex);
C#	FRRJIf.DataString AddString(FRRJIf.FRIF_DATA_TYPE *DataType*, int *StartIndex*, int *EndIndex*)

Specify one of the followings as DataType.

String register	STRREG(=13)
String register comment	STRREG_COMMENT(=14)
Numeric register comment	NUMREG_COMMENT(=15)
Position register comment	POSREG_COMMENT(=16)
SDI comment	SDI_COMMENT(=17)
SDO comment	SDO_COMMENT(=18)
RDI comment	RDI_COMMENT(=19)
RDO comment	RDO_COMMENT(=20)
UI comment	UI_COMMENT(=21)

UO comment	UO_COMMENT(=22)
SI comment	SI_COMMENT(=23)
SO comment	SO_COMMENT(=24)
WI comment	WI_COMMENT(=25)
WO comment	WO_COMMENT(=26)
WSI comment	WSI_COMMENT(=27)
GI comment	GI_COMMENT(=29)
GO comment	GO_COMMENT(=30)
AI comment	AI_COMMENT(=31)
AO comment	AO_COMMENT(=32)
Flag comment	FLAG_COMMENT(=37)

When it succeeds, this method returns DataString object. When it fails, this method returns Nothing. DataString object is to access string data.

<Example> register five string registers
Dim objDataString As DataString

Set objDataString = objCore.DataTable.AddString(STRREG, 1, 5)

(*) The maximum number of characters that can be obtained and set is 80. If the number of characters is over 80, only first 80 characters can be obtained and set.

5.3.1.14 AddFlag – Register flags to DataTable

VB:	Function AddFlag(ByVal StartIndex As Integer, ByVal EndIndex As Integer) As FRRJIf.DataFlag
VC++:	bridgeDataFlag AddFlag(int StartIndex, int EndIndex);
C#	FRRJIf.DataFlag AddFlag(int *StartIndex*, int *EndIndex*)

Specify the first and end index of flags.

When it succeeds, this method returns DataFlag object. When it fails, this method returns Nothing. DataFlag object is to read/write flags.

<Example> Register F[1] to F[15]
Dim objDataFlag As DataFlag

Set objDataFlag = objCore.DataTable.AddFlag(1, 15)

5.3.1.15 Refresh – Read data values from robot to refresh data

VB:	Function Refresh() As Boolean
VC++:	BOOL Refresh();
C#	bool Refresh()

When Refresh method is called, data of DataTable object are refreshed. DataTable object keeps the value until next Refresh method calling. If you want to get the latest robot data, you need to call this method. If you do not call this method, data on data table are not changed.

Success returns True, fails returns False.

Remark
(*) You must call data register methods like AddCurPos before connecting. You must not call data register methods after connecting. If you need to change data table, then you need to disconnect, delete all FRRJIF objects and create data table again.

5.4 FRRJIF.DataCurPos

5.4.1 Methods

Valid, GetValue

5.4.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.4.1.2 GetValue – Read current position

VB:	Function GetValue(ByRef Xyzwpr As System.Array, ByRef Config As System.Array, ByRef Joint As System.Array, ByRef UF As Short, ByRef UT As Short, ByRef ValidC As Short, ByRef ValidJ As Short) As Boolean
VC++:	BOOL GetValueXyzwpr(float* X, float* Y, float* Z, float* W, float* P, float* R, float* E1, float* E2, float* E3, short* C1, short* C2, short* C3, short* C4, short* C5, short* C6, short* C7, short* UF, short* UT, short* validc); BOOL GetValueJoint(float* J1, float* J2, float* J3, float* J4, float* J5, float* J6, float* J7, float* J8, float* J9, short* UT, short* ValidJ);
C#	bool GetValue(ref System.Array *Xyzwpr*, ref System.Array *Config*, ref System.Array *Joint*, ref short *UF*, ref short *UT*, ref short *ValidC*, ref short *ValidJ*)

Argument Xyzwpr() will have returned Cartesian values in Visual Basic. Xyzwpr() should have 9 elements (robot 6 axes + 3 extended axes).
Arugument Config() will have returned configuration of current position.
Config(0) to Config(3) mean as follows:

	Non 0	0
Config(0)	F(Flip)	N(NonFlip)
Config(1)	L(Left)	R(Right)
Config(2)	U(Up)	D(Down)
Config(3)	T(Front)	B(Back)

Config(4) to Config(6) mean turn numbers.
Argument Joint() will have returned joint values. Joint() should have 9 elements (robot 6 axes + 3 extended axes)
Argument UF will have returned user frame number. Argument UT will have returned user tool number.
When current position has valid Cartesian values, argument ValidC will have non 0. When current

position do not have valid Cartesian values, argument ValidC will have 0. When current position has valid joint values, argument ValidJ will have non 0. When current position do not have valid joint values, argument ValidJ will have 0. (For example, servo gun of motion group2 will return ValidC as 0)

In Visual C++, you use GetValueXyzwpr to get Cartesian values and use GetValueJoint to get joint values. Do not use array as arguments. X, Y, Z, W, P and R correspond to Xyzwpr(), C1 to C7 correspond to Config(), and J1 to J9 correspond to Joint().

Success returns True, fails returns False.

5.5 FRRJIF.DataNumReg

5.5.1 Methods

Valid, GetValue, SetValues

5.5.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.5.1.2 GetValue – Read numeric register value

VB:	Function GetValue(ByVal Index As Integer, ByRef Value As Object) As Boolean
VC++:	BOOL GetValue(long Index, object* value);
C#	bool GetValue(int *Index*, ref object *Value*)

Specify the index of target numeric register. Argument Value will have returned value.

Success returns True, fails returns False.

5.5.1.3 SetValues – Set a series of numeric register values

VB:	Function SetValues(ByVal Index As Integer, ByVal Value As Object, ByVal Count As Integer) As Boolean
VC++:	BOOL SetValuesInt(long Index, array<int>^ Value, long Count); BOOL SetValuesReal(long Index, array<float>^ Value, long Count);
C#	bool SetValues(int *Index*, object *Value*, int *Count*)

This method is to set a series of numeric register values at a time. It is faster than SetValue method.

Specify the index of the first target numeric register. Argument Value is array of set values. Specify the number of registers to argument Count.

In Visual C++, you use SetValuesInt to set integer values, use SetValuesReal to set real values.

Success returns True, fails returns False.

5.6 FRRJIF.DataPosReg

5.6.1 Methods

Valid, GetValue, SetValueJoint, SetValueXyzwpr

5.6.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.6.1.2 GetValue – Read position register value

VB:	Function GetValue(ByVal Index As Integer, ByRef Xyzwpr As System.Array, ByRef Config As System.Array, ByRef Joint As System.Array, ByRef UF As Short, ByRef UT As Short, ByRef ValidC As Short, ByRef ValidJ As Short) As Boolean
VC++:	BOOL GetValueXyzwpr(int Index, float* X, float* Y, float* Z, float* W, float* P, float* R, float* E1, float* E2, float* E3, short* C1, short* C2, short* C3, short* C4, short* C5, short* C6, short* C7, short* UF, short* UT, short* validc); BOOL GetValueJoint(int Index, float* J1, float* J2, float* J3, float* J4, float* J5, float* J6, float* J7, float* J8, float* J9, short* UT, short* ValidJ);
C#	bool GetValue(int *Index*, ref System.Array *Xyzwpr*, ref System.Array *Config*, ref System.Array *Joint*, ref short *UF*, ref short *UT*, ref short *ValidC*, ref short *ValidJ*)

Specify the index of target position register. Other arguments are the same as arguments of DataCurPos.GetValue method.

Success returns True, fails returns False.

5.6.1.3 SetValueJoint – Set joint value to position register

VB:	Function SetValueJoint(ByVal Index As Integer, ByRef Joint As System.Array, ByVal UF As Short, ByVal UT As Short) As Boolean
VC++:	BOOL SetValueJoint2(int Index, float J1, float J2, float J3, float J4, float J5, float J6, float J7, float J8, float J9, short UF, short UT);
C#	bool SetValueJoint(int *Index*, ref System.Array *Joint*, short *UF*, short *UT*)

Specify the index of target position register. Specify joint values, user frame number and user tool number to Joint(), UF and UT.

Success returns True, fails returns False.

5.6.1.4 SetValueXyzwpr – Set Cartesian value to position register

VB:	Function SetValueXyzwpr(ByVal Index As Integer, ByRef Xyzwpr As System.Array, ByRef Config As System.Array, ByVal UF As Short, ByVal UT As

	Short) As Boolean
VC++:	BOOL SetValueXyzwpr2(int Index, float X, float Y, float Z, float W, float P, float R, float E1, float E2, float E3, short C1, short C2, short C3, short C4, short C5, short C6, short C7, short UF, short UT);
C#	bool SetValueXyzwpr(int *Index*, ref System.Array *Xyzwpr*, ref System.Array *Config*, short *UF*, short *UT*)

Specify the index of target position register. Specify Cartesian values, configuration, user frame number and user tool number to Xyzwpr(), Config(), UF and UT.
In Visual C++, use each value, not array of values.
Please refer to DataCurPos.GetValue for details of the values.

Success returns True, fails returns False.

5.7 FRRJIF.DataPosRegXyzwpr

5.7.1 Methods

Valid, SetValueXyzwpr, Update, Reset

5.7.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.7.1.2 SetValueXyzwpr – Store Cartesian value to buffer

VB:	Function SetValueXyzwpr(ByVal Index As Integer, ByRef Xyzwpr As System.Array, ByRef Config As System.Array) As Boolean
VC++:	BOOL SetValueXyzwpr2(int Index, float X, float Y, float Z, float W, float P, float R, float E1, float E2, float E3, short C1, short C2, short C3, short C4, short C5, short C6, short C7);
C#	bool SetValueXyzwpr(int *Index*, ref System.Array *Xyzwpr*, ref System.Array *Config*)

Specify the index of target position register. Specify Cartesian values and configuration. The data is store in buffer. The data is not transfer immediately. You call SetValueXyzwpr multiple times to store a series of position registers, then you need to call Update method to transfer stored data.
In Visual C++, use each value, not array of values.
Please refer to DataCurPos.GetValue for details of the values.

Success returns True, fails returns False.

5.7.1.3 Update – Transfer buffered data to robot position registers

VB:	Function Update() As Boolean
VC++:	BOOL Update();
C#	bool Update()

This method is to transfer data in the buffer to robot. The transferred data is from minimum index that you call SetValueXyzwpr to maximum index that you call SetValueXyzwpr. (Transfer data that you do not call SetValueXyzwpr is zero value.) The buffer is reset after the transferring.

Success returns True, fails returns False.

5.7.1.4 Reset – Reset the buffer

VB:	Sub Reset( )
VC++:	void Reset();
C#	void Reset()

5.8 FRRJIF.DataPosRegMG

5.8.1 Methods

Valid、GetValueJoint, GetValueXyzwpr, SetValueJoint, SetValueXyzwpr, Update, Reset

5.8.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.8.1.2 GetValueJoint – Get joint values from a position register

VB:	Function GetValueJoint(ByVal Index As Integer, ByVal Group As Integer, ByRef float J1, ByRef float J2, ByRef float J3, ByRef float J4, ByRef float J5, ByRef float J6, ByRef float J7, ByRef float J8, ByRef float J9) As Boolean
VC++:	BOOL GetValueJoint(int Index, int Group, float* J1, float* J2, float* J3, float* J4, float* J5, float* J6, float* J7, float* J8, float* J9);
C#	bool GetValueJoint(int *Index*, int *Group*, ref float *J1*, ref float *J2*, ref float *J3*, ref float *J4*, ref float *J5*, ref float *J6*, ref float *J7*, ref float *J8*, ref float *J9*);

Specify the index of target position register. Specify the group number. The motion group should be specified as joint in AddPosRegMG calling.

Success returns True, fails returns False.

5.8.1.3 GetValueXyzwpr – Get Cartesian values from a position register

VB:	Function GetValueXyzwpr(int Index, int Group, ByRef float X, ByRef float Y, ByRef float Z, ByRef float W, ByRef float P, ByRef float R, ByRef float E1, ByRef float ByRef, ref float E3, ByRef short C1, ByRef short C2, ByRef short C3, ByRef short C4, ByRef short C5, ByRef short C6, ByRef short C7) As Boolean

VC++:	BOOL GetValueXyzwpr(int Index, int Group, float* X, float* Y, float* Z, float* W, float* P, float* R, float* E1, float* E2, float* E3, short* C1, short* C2, short* C3, short* C4, short* C5, short* C6, short* C7,)
C#	bool GetValueXyzwpr(int *Index*, int *Group*, ref float *X*, ref float *Y*, ref float *Z*, ref float *W*, ref float *P*, ref float *R*, ref float *E1*, ref float *E2*, ref float *E3*, ref short *C1*, ref short *C2*, ref short *C3*, ref short *C4*, ref short *C5*, ref short *C6*, ref short *C7*);

Specify the index of target position register. Specify the group number. Please refer to DataCurPos.GetValue for details of the values. The motion group should be specified as Cartesian in AddPosRegMG calling.

Success returns True, fails returns False.

5.8.1.4 SetValueJoint – Store joint values to buffer

VB:	Function SetValueJoint(ByVal Index As Integer, ByVal Group As Integer, ByRef Joint As System.Array) As Boolean
VC++:	BOOL SetValueJoint2(int Index, int Group, float J1, float J2, float J3, float J4, float J5, float J6, float J7, float J8, float J9);
C#	bool SetValueJoint(int *Index*, int *Group*, ref System.Array *Joint*)

Specify the index of target position register. Specify the motion group number. The motion group should be specified as joint in AddPosRegMG calling. The number of elements of the joint array must equal joint number in AddPosRegMG calling.
The data is store in buffer. The data is not transfer immediately. You call SetValueJoint or SetValueXyzwpr multiple times to store a series of position registers, and then you need to call Update method to transfer stored data.

Success returns True, fails returns False.

5.8.1.5 SetValueXyzwpr – Store Cartesian value to buffer

VB:	Function SetValueXyzwpr(ByVal Index As Integer, ByVal Group As Integer, ByRef Xyzwpr As System.Array, ByRef Config As System.Array,) As Boolean
VC++:	BOOL SetValueXyzwpr2(int Index, int Group, float X, float Y, float Z, float W, float P, float R, float E1, float E2, float E3, short C1, short C2, short C3, short C4, short C5, short C6, short C7);
C#	bool SetValueXyzwpr(int *Index*, int *Group*, ref System.Array *Xyzwpr*, ref System.Array *Config*)

Specify the index of target position register. Specify the group number. The motion group should be specified as Cartesian in AddPosRegMG calling. Please refer to DataCurPos.GetValue for details of the values.
The data is store in buffer. The data is not transfer immediately. You call SetValueJoint or SetValueXyzwpr multiple times to store a series of position registers, and then you need to call Update method to transfer stored data.

Success returns True, fails returns False.

5.8.1.6 Update – Transfer buffered data to robot position registers

VB:	Function Update() As Boolean
VC++:	BOOL Update();

C#	bool Update()

This method is to transfer data in the buffer to robot. The transferred data is from minimum index that is specified in AddPosRegMG calling to maximum index that is specified in AddPosRegMG calling. (Transfer data that you do not call SetValueJoint or SetValueXyzwpr is zero value.) The buffer is reset after the transferring.

Success returns True, fails returns False.

5.8.1.7 Reset – Reset the buffer

VB:	Sub Reset( )
VC++:	void Reset();
C#	void Reset()

5.9 FRRJIF.DataSysVar

(*) System variables cannot be referenced in R-50iA or later. Please use DataSysDataIdPos to reference Data IDs.

(*) When the string type is specified, the maximum number of characters that can be obtained and set is 80. If the number of characters is over 80, only first 80 characters can be obtained and set.

5.9.1 Methods

Valid, GetValue

5.9.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.9.1.2 GetValue – Read system variable value

VB:	Function GetValue(ByRef Value As Object) As Boolean
VC++:	BOOL GetValue(object* value, System.Text.Encoding encode);
C#	bool GetValue(ref object *Value*)

Argument Value will have returned system variable value.

Success returns True, fails returns False.

5.9.1.3 SetValue – Set system variable value

VB:	Function SetValue(ByVal Value As Object) As Boolean
VC++:	BOOL SetValue(const object value);
C#	bool SetValue(object *Value*)

Specify value to be set.

Success returns True, fails returns False.

5.10 FRRJIF.DataSysVarPos

(*) System variables cannot be referenced in R-50iA or later. Please use DataSysDataIdPos to reference Data IDs.

5.10.1 Methods

Valid, GetValue, SetValueJoint, SetValueXyzwpr

5.10.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.10.1.2 GetValue – Read POSITION type system varible value

VB:	Function GetValue(ByRef Xyzwpr As System.Array, ByRef Config As System.Array, ByRef Joint As System.Array, ByRef UF As Short, ByRef UT As Short, ByRef ValidC As Short, ByRef ValidJ As Short) As Boolean
VC++:	BOOL GetValueXyzwpr(float* X, float* Y, float* Z, float* W, float* P, float* R, float* E1, float* E2, float* E3, short* C1, short* C2, short* C3, short* C4, short* C5, short* C6, short* C7, short* UF, short* UT, short* validc); BOOL GetValueJoint(float* J1, float* J2, float* J3, float* J4, float* J5, float* J6, float* J7, float* J8, float* J9, short* UT, short* ValidJ);
C#	bool GetValue(ref System.Array *Xyzwpr*, ref System.Array *Config*, ref System.Array *Joint*, ref short *UF*, ref short *UT*, ref short *ValidC*, ref short *ValidJ*)

Arguments are the same as arguments of DataCurPos.GetValue method.

Success returns True, fails returns False.

5.10.1.3 SetValueJoint – Set joint value to system variable

VB:	Function SetValueJoint(ByRef Joint As System.Array, ByVal UF As Short, ByVal UT As Short) As Boolean
VC++:	BOOL SetValueJoint2(float J1, float J2, float J3, float J4, float J5, float J6, float J7, float J8, float J9, short UF, short UT);
C#	bool SetValueJoint(ref System.Array *Joint*, short *UF*, short *UT*)

Specify joint values, user frame number and user tool number to Joint(), UF and UT. In Visual C++, use each value, not array of values.

Success returns True, fails returns False.

5.10.1.4 SetValueXyzwpr – Set Cartesian value to system variable

VB:	Function SetValueXyzwpr(ByRef Xyzwpr As System.Array, ByRef Config As System.Array, ByVal UF As Short, ByVal UT As Short) As Boolean
VC++:	BOOL SetValueXyzwpr2(float X, float Y, float Z, float W, float P, float R, float E1, float E2, float E3, short C1, short C2, short C3, short C4, short C5, short C6, short C7, short UF, short UT);
C#	bool SetValueXyzwpr(ref System.Array *Xyzwpr*, ref System.Array *Config*, short *UF*, short *UT*)

Specify Cartesian values, configuration, user frame number and user tool number to Xyzwpr (), Config(), UF and UT. In Visual C++, use each value, not array of values. Please refer to DataCurPos.GetValue for details of the values.

Success returns True, fails returns False.

5.11 FRRJIF.DataSysDataId

Only R-50iA 7DH1/11 or later supports this service.

(*) When the string type is specified, the maximum number of characters that can be obtained and set is 80. If the number of characters is over 80, only first 80 characters can be obtained and set.

5.11.1 Methods

Valid, GetValue

5.11.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.11.1.2 GetValue – Read Data ID value

VB:	Function GetValue(ByRef Value As Object) As Boolean
VC++:	BOOL GetValue(object* value, System.Text.Encoding encode);
C#	bool GetValue(ref object *Value*)

Argument Value will have returned system variable value.

Success returns True, fails returns False.

5.11.1.3 SetValue – Set Data ID value

VB:	Function SetValue(ByVal Value As Object) As Boolean
VC++:	BOOL SetValue(const object value);

C#	bool SetValue(object *Value*)

Specify value to be set.

Success returns True, fails returns False.

5.12 FRRJIF.DataSysDataIdPos

Only R-50iA 7DH1/11 or later supports this service.

5.12.1 Methods

Valid, GetValue, SetValueJoint, SetValueXyzwpr

5.12.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.12.1.2 GetValue – Read POSITION type Data ID value

VB:	Function GetValue(ByRef Xyzwpr As System.Array, ByRef Config As System.Array, ByRef Joint As System.Array, ByRef UF As Short, ByRef UT As Short, ByRef ValidC As Short, ByRef ValidJ As Short) As Boolean
VC++:	BOOL GetValueXyzwpr(float* X, float* Y, float* Z, float* W, float* P, float* R, float* E1, float* E2, float* E3, short* C1, short* C2, short* C3, short* C4, short* C5, short* C6, short* C7, short* UF, short* UT, short* validc); BOOL GetValueJoint(float* J1, float* J2, float* J3, float* J4, float* J5, float* J6, float* J7, float* J8, float* J9, short* UT, short* ValidJ);
C#	bool GetValue(ref System.Array *Xyzwpr*, ref System.Array *Config*, ref System.Array *Joint*, ref short *UF*, ref short *UT*, ref short *ValidC*, ref short *ValidJ*)

Arguments are the same as arguments of DataCurPos.GetValue method.

Success returns True, fails returns False.

5.12.1.3 SetValueJoint – Set joint value to Data ID

VB:	Function SetValueJoint(ByRef Joint As System.Array, ByVal UF As Short, ByVal UT As Short) As Boolean
VC++:	BOOL SetValueJoint2(float J1, float J2, float J3, float J4, float J5, float J6, float J7, float J8, float J9, short UF, short UT);
C#	bool SetValueJoint(ref System.Array *Joint*, short *UF*, short *UT*)

Specify joint values, user frame number and user tool number to Joint(), UF and UT. In Visual C++, use each value, not array of values.

Success returns True, fails returns False.

5.12.1.4 SetValueXyzwpr – Set Cartesian value to Data ID

VB:	Function SetValueXyzwpr(ByRef Xyzwpr As System.Array, ByRef Config As System.Array, ByVal UF As Short, ByVal UT As Short) As Boolean
VC++:	BOOL SetValueXyzwpr2(float X, float Y, float Z, float W, float P, float R, float E1, float E2, float E3, short C1, short C2, short C3, short C4, short C5, short C6, short C7, short UF, short UT);
C#	bool SetValueXyzwpr(ref System.Array *Xyzwpr*, ref System.Array *Config*, short *UF*, short *UT*)

Specify Cartesian values, configuration, user frame number and user tool number to Xyzwpr (), Config(), UF and UT. In Visual C++, use each value, not array of values. Please refer to DataCurPos.GetValue for details of the values.

Success returns True, fails returns False.

5.13 FRRJIF.DataTask

5.13.1 Methods

Valid, GetValue

5.13.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.13.1.2 GetValue – Read program execution status

VB:	Function GetValue(ByRef ProgName As String, ByRef LineNumber As Short, ByRef State As Short, ByRef ParentProgName As String) As Boolean
VC++:	BOOL GetValue(String* ProgName, short* LineNumber, short* State, String* ParentProgName, System.Text.Encoding encode);
C#	bool GetValue(ref string *ProgName*, ref short *LineNumber*, ref short *State*, ref string *ParentProgName*, System.Text.Encoding *Encode*)

Argument ProgName will have returned current executing program name.

Argument LineNumber will have returned current executing program line number.

Argument State will have returned execution status. When program stopped, State is 0. When program paused, State is 1. When program executing, State is 2.

Argument ParentProgName will have returned program name that is executed first. If no child program is called, value of ParentProgName is the same as value of ProgName.

(*) DataType for FRRJIF.DataTable.AddTask affects target current executing program. Please refer FRRJIF.DataTable.AddTask.

(*) The maximum number of characters in a program name that can be obtained is 16. If the number of characters is over 16, only first 16 characters can be obtained.

Success returns True, fails returns False.

5.14 FRRJIF.DataAlarm

5.14.1 Methods

Valid, GetValue

5.14.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.14.1.2 GetValue – Read alarm history

VB:	Function GetValue(ByVal Count As Integer, ByRef AlarmID As Short, ByRef AlarmNumber As Short, ByRef CauseAlarmID As Short, ByRef CauseAlarmNumber As Short, ByRef Severity As Short, ByRef Year As Short, ByRef Month As Short, ByRef Day As Short, ByRef Hour As Short, ByRef Minute As Short, ByRef Second As Short, ByRef AlarmMessage As String, ByRef CauseAlarmMessage As String, ByRef SeverityMessage As String) As Boolean
VC++:	BOOL GetValue(int Count, short* AlarmID, short* AlarmNumber, short* CauseAlarmID, short* CauseAlarmNumber, short* Severity, short* Year, short* Month, short* Day, short* Hour, short* Minute, short* Second, String* AlarmMessage, String* CauseAlarmMessage, String* SeverityMessage, System.Text.Encoding encoding);
C#	bool GetValue(int *Count*, ref short *AlarmID*, ref short *AlarmNumber*, ref short *CauseAlarmID*, ref short *CauseAlarmNumber*, ref short *Severity*, ref short *Year*, ref short *Month*, ref short *Day*, ref short *Hour*, ref short *Minute*, ref short *Second*, ref string *AlarmMessage*, ref string *CauseAlarmMessage*, ref string *SeverityMessage*)

Specify argument Count as index of target alarm history item. (Specify 1 for the first item.) Argument AlarmID will have returned alarm ID. In case of ‘SRVO-001’, AlarmID is 11 that represents ‘SRVO’. Please see alarm code table in R-J3 reference. If there is no active alarm, AlarmID is zero for active alarm reference.

Argument AlarmNumber will have returned alarm number. In case of ‘SRVO-001’, AlarmNumber is 1. If there is no active alarm, AlarmNumber is zero for active alarm reference.

Argument CauseAlarmID will have returned cause alarm ID. Some alarm have two alarm messages. The second alarm is cause code. This argument is to read cause code. If there is no cause code, CauseAlarmID is 0.

Argument CauseAlarmNumber will have returned cause alarm Number. This argument is to read cause code alarm number. If there is no cause code, CauseAlarmNumber is 0.

Argument Severity will have return alarm severity. Severity value means as follows:

NONE	128
WARN	0, 4
PAUSE.L	2
PAUSE.G	34
STOP.L	6
STOP.G	38
SERVO	54
ABORT.L	11
ABORT.G	43
SERVO2	58
SYSTEM	123

Argument Year, Month, Day, Hour, Minute, Second will have returned alarm occurred date and time (24 hours format).

Argument AlarmMessage will have returned alarm message. The message is the top line to teach pendant screen includes alarm code like 'SRVO-001'. (Kanji message not supported.)

Argument CauseAlarmMessage will have returned cause code alarm message. (Kanji message not supported)

Argument SeverityMessage will have returned alarm severity string like 'WARN'.

Success returns True, fails returns False.

5.15 FRRJIF.DataString

Only R-30iA 7DA7/13 or later supports this service.

(*) The maximum number of characters that can be obtained and set is 80. If the number of characters is over 80, only first 80 characters can be obtained and set.

5.15.1 Methods

Valid, GetValue, SetValue, Update, Reset

5.15.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.15.1.2 GetValue – Get string value

VB:	Function GetValue(ByVal Index As Integer, ByRef Value As String) As Boolean
VC++:	BOOL GetValue(long Index, String* Value, System.Text.Encoding encode);
C#	bool GetValue(int *Index*, ref string *Value*)

Specify the index of target string data (string register or comment). Argument Value will have returned string data value.

Success returns True, fails returns False.

5.15.1.3 SetValue – Store string value to buffer

VB:	Function SetValue(ByVal Index As Integer, ByVal Value As String) As Boolean
VC++:	BOOL SetValue(long Index, String Value);
C#	bool SetValue(int *Index*, string *Value*)

Specify the index of target string data (string register or comment). Specify a string data. The data is store in buffer. The data is not transfer immediately. You call SetValue multiple times to store a series of string data, then you need to call Update method to transfer stored data.

Success returns True, fails returns False.

5.15.1.4 Update – Transfer buffered data to robot

VB:	Function Update() As Boolean
VC++:	BOOL Update();
C#	bool Update()

This method is to transfer data in the buffer to robot. The transferred data is from most minimum index that you call SetValue to maximum index that you call SetValue. The buffer is reset after the transferring.

Success returns True, fails returns False.

5.15.1.5 Reset – Reset the buffer

VB:	Sub Reset( )
VC++:	void Reset();
C#	void Reset()

5.16 FRRJIF.DataFlag

5.16.1 Methods

Valid, GetValue, SetValues

5.16.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.16.1.2 GetValue – Read flag value

VB:	Function GetValue(ByVal Index As Integer, ByRef Value As Short) As Boolean

VC++:	BOOL GetValue(long Index, short* value);
C#	bool GetValue(int *Index*, ref short *Value*)

Specify the index of a target flag. Argument Value will have returned value.

Success returns True, fails returns False.

5.16.1.3 SetValues – Set a series of flag values

VB:	Function SetValues(ByVal Index As Integer, ByRef Value As System.Array, ByVal Count As Integer) As Boolean
VC++:	BOOL SetValues(long Index, array<short>^ Value, long Count);
C#	bool SetValues(int *Index*, object *Value*, int *Count*)

This method is to set a series of flags at a time.
Specify the index of the first target flags. Argument Value is array of set values. Specify the number of flags to argument Count.

Success returns True, fails returns False.

5.17 FRRJIF.VirtualRobotSafetyIOHelper

Only virtual robot R-30iB Plus 7DF1 or later supports this service. R-50iA does not support this service.

(*) You must not use it when a real robot is connected. It works only when a virtual robot is connected.

(*) To use safe I/O, you must use a virtual robot with the required software options loaded.

5.17.1 Methods

AddSpiTo, AddCsiTo

5.17.1.1 AddSpiTo – Register SPI (Safe Peripheral Input) to DataTable

VB:	Function AddSpiTo(ByVal DataTable As FRRJIf.DataTable, ByVal StartIndex As Integer, ByVal EndIndex As Integer) As FRRJIf.VirtualRobotSpi
VC++:	bridgeVirtualRobotSpi^ AddSpiTo(FRRJIf.DataTable DataTable, int StartIndex, int EndIndex);
C#	FRRJIf.VirtualRobotSpi AddSpiTo(FRRJIf.DataTable *DataTable*, int *StartIndex*, int *EndIndex*)

When this object is valid, returns True. When it fails, this method returns Nothing. VirtualRobotSpi object is to read/write SPI.

<Example> Register SPI[1] to SPI[5]
Dim objVirtualRobotSpi As VirtualRobotSpi

Set objVirtualRobotSpi = VirtualRobotSafetyIOHelper.AddSpiTo(objCore.DataTable, 1, 5)

(*)It can access up to SPI[128] as far as the connected virtual robot supports. The supported range of SPI depends on the software version, loaded software options, and various settings.

5.17.1.2 AddCsiTo – Register CSI (CIP Safety Input) to DataTable

VB:	Function AddCsiTo(ByVal DataTable As FRRJIf.DataTable, ByVal StartIndex As Integer, ByVal EndIndex As Integer) As FRRJIf.VirtualRobotCsi
VC++:	bridgeVirtualRobotCsi^ AddCsiTo(FRRJIf.DataTable DataTable, int StartIndex, int EndIndex);
C#	FRRJIf.VirtualRobotCsi AddCsiTo(FRRJIf.DataTable *DataTable*, int *StartIndex*, int *EndIndex*)

When this object is valid, returns True. When it fails, this method returns Nothing. VirtualRobotCsi object is to read/write CSI.

<Example> Register CSI[1] to CSI[5]
Dim objVirtualRobotCsi As VirtualRobotCsi

Set objVirtualRobotCsi = VirtualRobotSafetyIOHelper.AddCsiTo(objCore.DataTable, 1, 5)

(*)It can access up to CSI[64] as far as the connected virtual robot supports. The supported range of CSI depends on the software version, loaded software options, and various settings.

5.18 FRRJIF. VirtualRobotSpi

Only virtual robot R-30iB Plus 7DF1 or later supports this service. R-50iA does not support this service.

(*) You must not use it when a real robot is connected. It works only when a virtual robot is connected.

(*)It can access up to SPI[128] as far as the connected virtual robot supports. The supported range of SPI depends on the software version, loaded software options, additional safety I/O board and various settings.

5.18.1 Methods

Valid, Read, Write

5.18.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.18.1.2 Read – Read SPI (Safe Peripheral Input)

VB:	Function Read(ByVal Index As Integer, ByRef Buffer As System.Array, ByVal Count As Integer) As Boolean
VC++:	long Read(short Index, array<short>^ Buffer, int Cnt);
C#	bool Read(int *Index*, System.Array *Buffer*, int *Count*)

This method is to read a series of SPI.
Specify the first index of referred SPI, integer (or Long) array to store values and the number of referred SPI as arguments.

Success returns True, fails returns False in Visual Basic, C# cases. Success returns 1, fails returns 0 in Visual C++ cases.

5.18.1.3 Write – Write SPI (Safe Peripheral Input)

VB:	Function Write(ByVal Index As Integer, ByRef Buffer As System.Array, ByVal Count As Integer) As Boolean
VC++:	long Write(short Index, array<short>^ Buffer, int Cnt);
C#	bool Write(int *Index*, System.Array *Buffer*, int *Count*)

This method is to write a series of SPI at a time.
Specify the first index of written SPI, integer (or Long) array to store values and the number of referred SPI as arguments.

Success returns True, fails returns False in Visual Basic, C# cases. Success returns 1, fails returns 0 in Visual C++ cases.

(*) If SPI has been changed since DataTable was last refreshed, you must refresh DataTable before writing.

(*) You had better write a series of SPI at a time to reduce access time.

5.19 FRRJIF. VirtualRobotCsi

Only virtual robot R-30iB Plus 7DF1 or later supports this service. R-50iA does not support this service.

(*) You must not use it when a real robot is connected. It works only when a virtual robot is connected.

(*)It can access up to CSI[64] as far as the connected virtual robot supports. The supported range of CSI depends on the software version, loaded software options, and various settings.

5.19.1 Methods

Valid, Read, Write

5.19.1.1 Valid – Check object validity

VB:	Property Valid As Boolean(read only)
VC++:	BOOL get_Valid();
C#	bool Valid { get; }

When this object is valid, returns True. When this object is invalid, returns False.

5.19.1.2 Read – Read CSI (CIP Safety Input)

VB:	Function Read(ByVal Index As Integer, ByRef Buffer As System.Array, ByVal Count As Integer) As Boolean

VC++:	long Read(short Index, array<short>^ Buffer, int Cnt);
C#	bool Read(int *Index*, System.Array *Buffer*, int *Count*)

This method is to read a series of CSI.
Specify the first index of referred CSI, integer (or Long) array to store values and the number of referred SPI as arguments.

Success returns True, fails returns False in Visual Basic, C# cases. Success returns 1, fails returns 0 in Visual C++ cases.

5.19.1.3 Write – Write CSI (CIP Safety Input)

VB:	Function Write(ByVal Index As Integer, ByRef Buffer As System.Array, ByVal Count As Integer) As Boolean
VC++:	long Write(short Index, array<short>^ Buffer, int Cnt);
C#	bool Write(int *Index*, System.Array *Buffer*, int *Count*)

This method is to write a series of CSI at a time.
Specify the first index of written CSI, integer (or Long) array to store values and the number of referred SPI as arguments.

Success returns True, fails returns False in Visual Basic, C# cases. Success returns 1, fails returns 0 in Visual C++ cases.

(*) If CSI has been changed since DataTable was last refreshed, you must refresh DataTable before writing.

(*) You had better write a series of CSI at a time to reduce access time.

6 Connect To ROBOGUIDE

You can connect your robot interface application to virtual robots on ROBOGUIDE. You can use ROBOGUIDE for developing/testing your application with virtual robots.

6.1 Environment

ROBOGUIDE V7 Rev.F(7N06) or later is needed. Virtual robot should be R-30iA 7DA5/15, R-30iA 7DA7/13 or later.

6.2 About IP Address Of The Virtual Robot

To confirm IP address of the virtual robot, please click ROBOGUIDE menu Robot/Default Browser to open the robot home page. Internet Explorer address bar indicates the robot IP address like " http://127.0.0.1/" or "http://127.0.0.1:9001/". The IP address is " 127.0.0.1" in this example. Your virtual robot may have another IP address like "127.0.0.2."

If "127.0.0.#" is not accepted, please try to use IP address of the PC or "localhost".

6.3 Virtual Robot Selection

A ROBOGUIDE workcell can have multiple virtual robots. And a PC can have multiple ROBOGUIDE. Thus, the PC may have multiple virtual robots at a time. Your robot interface application will connect to a virtual robot. It is necessary to specify the target virtual robot. If virtual robots are running with loopback address, you can specify a virtual robot with IP address because each virtual robot is assigned a different loopback address. Otherwise, you can specify a virtual robot with port number because each virtual robot is assigned a different port number.

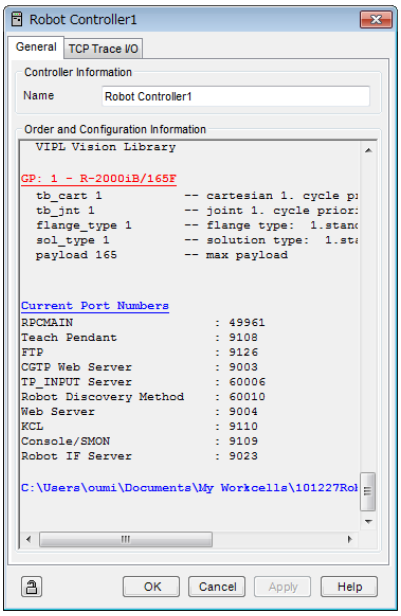
(*) To run virtual robots with loopback address, ROBOGUIDE V9 Rev.T (7N09/22) or later is needed. Loop back address is 127.0.0.#. (127.0.0.2, etc.)

(*) The port number should be specified only when a virtual robot is connected. When a real robot is connected, the port number must not be specified because a default number is used as the port number.

6.3.1 How To Get Port Number

A virtual robot may have different port number every start up. Thus, you need to get port number of target virtual robot before connection every time.

You can confirm port number in the robot controller property page of ROBOGUIDE. The property page has "Order and Configuration Information". It includes "Current Port Numbers". "Robot IF Server" is the port number. In the below example, the port number is 9023.



(*) If you cannot see port number information in the property page, ROBOGUIDE and/or virtual robot is old. You need to update ROBOGUIDE.
(*) If R650 FRA Params is selected and R553 "HMI Device (SNPX)" is not selected on the virtual robot, you cannot see the port number. Please add R553 "HMI Device (SNPX)" to the virtual robot.

Another way to get port number is reading from a file in the workcell directory. ROBOGUIDE assigns ID to every virtual robot at creating. You can confirm ID of target virtual robot in cell browser. Robot controller node has text like "C: ID - Name". For example, the robot controller node has "C : 1 - Left Robot", the ID is 1. After starting up virtual robots, you can access workcell_folder/robot_ID/services.txt. (If ID is 1. Robot_ID is Robot_1.) Services.txt has port number information. You can get the port number in the line that begins with "Robot IF Server".

6.3.2 How To Use Port Number

It is need to set the port number to FRRJIf.Core.PortNumber property before the connection.

<Sample Code - "HostName:PortNumber" format>

```
'get host name
If HostName = "" Then
    strHost = GetSetting(cnstApp, cnstSection, "HostName")
    strHost = InputBox("Please input robot host name", , strHost)
    If strHost = "" Then
        End
    End If
    SaveSetting cnstApp, cnstSection, "HostName", strHost
    HostName = strHost
Else
    strHost = HostName
End If

'check port number
Dim strArray() As String
If InStr(strHost, ":") > 0 Then
    strArray = Split(strHost, ":")
```

```
        strHost = strArray(0)
        If IsNumeric(strArray(1)) Then
            mobjCore.PortNumber = CInt(strArray(1))
        End If
    End If

    'connect
    blnRes = mobjCore.Connect(strHost)
    If blnRes = False Then
        msubDisconnected
    Else
        msubConnected
    End If
```

7 Automatic Operation

Robot interface has no functions specialized for starting a program. However a program can be started via a network by setting values of Flags (F[*]) by using robot interface. Additionally the program can be selected using the program number selection (PNS) function and the robot start request (RSR) function.
As an example of starting a program by using robot interface, the setting procedures for using RSR are explained below. For details on each robot setting, please refer to the operator's manual for your robot controller.

7.1 Setup Robot

First, assign peripheral (UOP) I/O. Select “Full” as “UOP auto assignment” in the system config menu and assign UI to Flags (Rack: 34, Slot: 1) in the I/O screen. Please check that the values of UI are changed when change the values of Flags.

Next, create a program to be started and setup RSR. Please refer to the operator's manual to setup RSR and check that the program is started by changing Flags corresponding to RSR inputs.

(*) If robot is setup to start the program with Flags, the program may be started unintentionally. Please be careful enough for safety.

(*) The I/O assignment varies depending on your environment. This setting procedure is an example, thus please setup robot according to your environment.

(*) To start the program, it is necessary to satisfy the remote conditions and the ready conditions. Please refer to the operator's manual for details.

(*) Even if functions other than RSR are used, the program can be started by using robot interface, by setting so that the program can be started with Flags.

7.2 Create Program For PC

Create a program for PC to set assigned Flags. It is necessary to turn off and turn on Flags because the program is started at the rising edge of Flags corresponding to RSR inputs.
To set Flags by robot interface, DataFlag.SetValues is used.

(*) Depending on contents of the created program for PC, the program may be started unintentionally. Please be careful enough for safety.

(*) The Flag settings for starting the program varies depending on your environment and robot settings. Please set Flags according to your environment.

8 Trouble Shooting

- Please confirm communication between PC and robot without robot interface. For example, open robot home page with Internet Explorer. If you cannot open robot home page, your network may have trouble. Please confirm IP configuration, cable, hub and so on.

- If the robot has R650 FRA Params option, R553 "HMI Device (SNPX)" is needed. (If R651 FRL Params is selected, no option is needed.)

- Please use robot interface sample program in order to test communication between robot and PC.

- Please set enough time out value. If time out value is too short, it may cause communication errors since response time is not constant.

- Please consider to retry connection for communication errors. It will be more robust software.

- When communication error occur, robot interface write error messages with OutputDebugString API. You will get like the following messages.

  208: [RobotIF.acc_socket] Time Out at line 369, 0, 501, 10000
  208: [RobotIF.snpx_rw] Error at line 290

  If the message includes "Time Out", enlarge time out value may fix the communication error.

  (*) FANUC provides dbmon.exe that is to capture the messages. Please find dbmon.exe in install CD-ROM tools folder. Please use in on PC local disk.

- Network protocol analyzer for Windows may help you to grasp the situation.

- If the error (PRIO-096 SNPX Connection is full) is occurred in a robot and connecting is failed, the robot may be attempting to connect beyond the maximum number of the concurrent connection. Please check a connection status between robot and each application. Additionally, the robot may have unnecessary connections. Please consider to disconnect unnecessary connections, and check that disconnecting with the robot is successful. When connecting to the robot again, you need to delete all FRRJIF objects.

  (*) If the robot is connecting with Zero Down Time, FIELD system, MT-LINKi or other FANUC applications, the number of the concurrent connections may be limited.

- If communication errors occur with robot moving, the noise may cause the errors. Please suppress noise such cases.

- Ethernet port CD38C on the robot cannot be used to connect by robot interface. Please use CD38A or CD38B.

- To enable logging function, please specify the following registry.

  [HKEY_CURRENT_USER¥Software¥VB and VBA Program Settings¥FRRJIF¥Setting]
  "DebugOut"="True"

  The following registry values defines log output directory.
  [HKEY_CURRENT_USER¥Software¥VB and VBA Program Settings¥FRRJIF¥Setting]
  "DebugOutPath"

  If log output directory is not defined. Log file is written in install directory (usually C:¥Program Files¥FANUC¥FRRJIf).
  Log file name is log*yymmddhhmmss*.txt. (It may be necessary to execute your application as administrator in order to write the log file.)

  Please FRRJIF.Core object DebugLog to True to get more detail information.

  (*) Please enable logging function only when you need it. It may make performance down.