FPM-DCI Communication Server

for Microsoft Windows
and InTouch Applications

**User Manual
Ver 2.x Rev 1.10
DR 020 15
DR 020 16**

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Communication Server

Overview

The **FPM-DCI Communication Server** (hereafter referred to as the "FPM-DCI Server" or "FPM-DCI" or "Server") is a Microsoft Windows application program that acts as a communication protocol server and allows other Windows application programs to access the data on Fischer&Porter Company's MICRO-DCI and ABB controllers of the following types: 53MC1000, 53MC2000, 53MC4000, 53MC5000, KM2000, 2340REC, 50XM1000, 53SL6000 and ABB ES7000. The Server is intended for serial communication with MICRO-DCI controllers through the "Data Link Port" on the controllers. Connection to the host computer is through the serial communication port of the host via a RS-422/485 adapter board or external converter. However for 53MC5000 model controller the Server supports additional RS-232 communication channel ("Configuration Port"), provided as a standard part of the 53MC5000 controller. Any Microsoft Windows program that is capable of acting as a **DDE**, **FastDDE**, **SuiteLink** or **OPC** *Client* may use the FPM-DCI Server.

There are two different *Server* versions described in this manual:
- Server version (ordering number DR 020 15), supporting SuiteLink, FastDDE and DDE protocols; this version hereafter is referred to as the "***Suite Link & DDE***" version.
- Server version (ordering number DR 020 16), supporting OPC and DDE protocols; this version hereafter is referred to as the "***OPC & DDE***" version;

The separate installation package is supplied for each version of the Server. In both cases, the name of Server executable file is **FPM-DCI.EXE**. All further information in this manual is same for all versions of the Server, with the exception of few points where communication protocol specific features are explained.

Communication Protocols

Dynamic Data Exchange (DDE) is a communication protocol developed by Microsoft to allow applications in the Windows environment to send/receive data and instructions to/from each other. It implements a client-server relationship between two concurrently running applications. The server application provides the data and accepts requests from any other application interested in its data. Requesting applications are called clients. Some applications such as Wonderware InTouch and Microsoft Excel can simultaneously be both a client and a server.

FastDDE provides a means of packing many proprietary Wonderware DDE messages into a single Microsoft DDE message. This packing improves efficiency and performance by reducing the total number of DDE transactions required between a client and a server. Although Wonderware's FastDDE has extended the usefulness of DDE for the industry, this extension is being pushed to its performance constraints in distributed environments. The FPM-DCI Server "Suite Link & DDE version" supports the FastDDE Version 3 - an extension to Wonderware's proprietary FastDDE Version 2. This extension supports the transfer of Value Time Quality (VTQ) information. The original DDE and FastDDE Version 2 formats are still supported, providing full backward compatibility with older DDE clients. FastDDE Version 3 works on Windows 9x systems as well as Windows NT systems.

NetDDE extends the standard Windows DDE functionality to include communication over local area networks and through serial ports. Network extensions are available to allow DDE links between applications running on different computers connected via networks or modems. For example, NetDDE supports DDE between applications running on IBM compatible computers connected via LAN or modem and DDE-aware applications running on non-PC based platforms under operating environments such as VMS and UNIX.

SuiteLink uses a TCP/IP based protocol and is designed by Wonderware specifically to meet industrial needs such as data integrity, high-throughput, and easier diagnostics. This protocol standard is only supported on Microsoft Windows NT 4.0 or higher. SuiteLink is not a replacement for DDE, FastDDE, or NetDDE. The protocol used between a client and a server depends on your network connections and configurations. SuiteLink was designed to be the industrial data network distribution standard and provides the following features:

· Value Time Quality (VTQ) places a time stamp and quality indicator on all data values delivered to VTQ-aware clients.
· Extensive diagnostics of the data throughput, server loading, computer resource consumption, and network transport are made accessible through the Microsoft Windows NT operating system Performance Monitor. This feature is critical for the scheme and maintenance of distributed industrial networks.
· Consistent high data volumes can be maintained between applications regardless if the applications are on a single node or distributed over a large node count.
· The network transport protocol is TCP/IP using Microsoft's standard WinSock interface.

OPC (OLE for Process Control) is an open interface standard to provide data from a data source and communicate the data to any client application in a common standard way. The OPC is based on Microsoft OLE, COM and DCOM technologies and enables simple and standardised data interchange between the industrial or office sector and the production sector. From general point of view many aspects of OPC are similar to DDE, but main difference is in the implementation by using Microsoft's COM (Component Object Model) technology. It enables fast exchange with process automation data and OPC open interface allows access to data from OPC Server in same standard way from OPC client applications supplied by different developers.

For more information on the basics of OPC, please refer to the ***OPC Specification***. The OPC Data Access Custom Interface Specification is maintained by ***OPC Foundation***, the current specification is 2.04 dated September 2000.

The OPC support for FPM-DCI Server "OPC & DDE" version is implemented based on ***FactorySoft OPC Server Development Toolkit*** and it conforms to OPC Data Access Custom Interface Specification 2.04. The FPM-DCI Server "OPC & DDE" version is tested for compliance and is compatible with OPC Foundation OPC Data Access Compliance Test Tool.

The Suite Link, FastDDE (Version 3) and DDE support for FPM-DCI Server "Suite Link & DDE" version is implemented by ***Wonderware I/O Server Toolkit*** ver. 7.0 (060).

The FastDDE (Version 2) and DDE support for FPM-DCI Server "OPC & DDE" version is implemented by ***Wonderware I/O Server Toolkit*** ver. 5.0 (008).

Accessing a Remote Items via the Server

The communication protocol addresses an element of data in a conversation that uses a three-part naming convention that includes the ***application name***, ***topic name*** and ***item name***. The following briefly describes each portion of this naming convention:

application name
The name of the Windows program (server) that will be accessing the data element. In the case of data coming from or going to FPM-DCI PLC via this Server, the application portion of the address is **FPM-DCI**.

topic name
Meaningful names are configured in the Server to identify specific devices. These names are then used as the topic name in all conversations to that device. For example, **PLC1**. **Note!** You can define multiple topic names for the same device (PLC) to poll different items at different rates.

item name
A specific data element within the specified topic. For example, when using this Server, items can be individual Marker Words, Input Words, Output Words and Bits in the FPM-DCI PLC. The term "point" is used interchangeably with the term "item" in this User Manual. For more information on item names, see the ***Item Names*** section later in this manual.

Installing the FPM-DCI Server

Installing the Server

The FPM-DCI Server installation package can be supplied:

1. As a self-extracting archive (02015xxx.EXE for "Suite Link & DDE" version or 02016xxx.EXE for "OPC & DDE" version) if downloaded from Klinkmann's web site (the xxx is the current (latest) version of the Server).
2. From installation on CD.
3. On two or three distribution disks (floppies).

To **install** the FPM-DCI Server from the self-extracting archive, run the 02015xxx.EXE or 02016xxx.EXE and proceed as directed by the FPM-DCI Server Setup program.

To **install** the FPM-DCI Server from CD or distribution disks, on MS Windows (NT, 2000, XP or 95 (98)):

1. Insert the CD with Klinkmann Software into CD drive or insert the FPM-DCI Server Disk1 into a floppy drive A: or B:.
2. Select the **Run** command under the **Start** menu.
3. Run STARTUP.EXE if installing from CD or SETUP.EXE if installing from distribution disks (floppies).
4. If installing from CD: select "Protocol Servers (DDE, SuiteLink, OPC)", find "FPM-DCI SL and DDE Server" or "FPM-DCI OPC and DDE Server" and click on "Setup…".
5. Proceed as directed by the FPM-DCI Server Setup program.

Notes:

*1. If installing the FPM-DCI Server "OPC & DDE" version on Windows 95 then DCOM (Distributed COM) must be installed on Windows 95 before installing the FPM-DCI Server. The DCOM update can be obtained, for example, from the Microsoft's web site http://www.microsoft.com/com/dcom95/ or from Microsoft Visual C++ 5.0 and 6.0 CDs. Before starting the FPM-DCI Server the DCOM must be configured (both on NT and Win9x) for right "Access Permissions" and "Location" (on NT) or "Properties" (on Win 9x). See **Configuring DCOM** section in this manual for DCOM configuration details.*

2. All MS Windows (both NT and 9x) applications using Microsoft's shared DLLs (e.g. MFC42.DLL and MSVCRT.DLL) must be closed before installing the FPM-DCI Server "OPC & DDE" version. Otherwise there can be problems with FPM-DCI Server registration as OPC server. If during the FPM-DCI Server "OPC & DDE" version installation some warning messages about shared DLLs are displayed, then it is quite possible the FPM-DCI Server registration as OPC server failed. In this case after system reboot the FPM-DCI Server registration as OPC server can be done by starting the FPM-DCI Server manually with special command line parameter added: "FPM-DCII /Regserver".

When installation is finished, the subdirectory specified as a folder where to install the FPM-DCI Server files will contain the following files:

FPM-DCI.EXE   The FPM-DCI Server Program. This is a Microsoft Windows 32-bit application program.

FPM-DCI.HLP   The FPM-DCI Server Help file.

FPM-DCI.CFG   An example configuration file.

LICENSE.TXT   Klinkmann Automation software license file.

KLSERVER.DLL   Dynamic Link Library necessary for "OPC & DDE"version of the Server.

WWDLG32.DLL   Dynamic Link Library necessary only for "OPC & DDE"version of the Server.

To **uninstall** the FPM-DCI Server, start Control Panel, select "Add/Remove Programs" and select the "FPM-DCI SL and DDE Server" or "FPM-DCI OPC and DDE Server" from the list of available software products. Click on "Add/Remove…" and proceed as directed by the UnInstallShield program.

Notes:

*1. The FPM-DCI Server "Suite Link & DDE" version is developed with Wonderware I/O Server Toolkit (ver 7.0) and needs the **Wonderware FS2000 Common Components** to be installed on computer where the FPM-DCI Server is running. The Wonderware FS2000 Common Components are installed automatically when any of Wonderware FS2000 Components (e.g. InTouch or some Wonderware I/O server) is installed.*

*2. If FPM-DCI Server "Suite Link & DDE" version will run on PC where Wonderware FS2000 Common Components are not installed then a special **I/O Server Infrastructure installation package** can be obtained from Klinkmann Automation (see **Installing the I/O Server Infrastructure** section below). This I/O Server Infrastructure installation package contains the minimum set of software needed to run the FPM-DCI Server "Suite Link & DDE" version and these infrastructure files must be install prior to executing the FPM-DCI Server.*

3. The HASP key is needed for full time running of FPM-DCI Server. The HASP Driver setup is performed during the Server setup. Without HASP Driver installed, the FPM-DCI Server will run only 1 hour (with all features enabled).

Installing the I/O Server Infrastructure

The I/O Server Infrastructure installation package can be supplied:

1. As a self-extracting archive (IOServerInfrastructure.exe) if downloaded from Klinkmann's web site.
2. On one distribution disk (floppy).

To **install** the I/O Server Infrastructure from the self-extracting archive, run the IOServerInfrastructure.exe and proceed as directed by the I/O Server Infrastructure Setup program.

To **install** the I/O Server Infrastructure from the distribution disk, on MS Windows (NT or 95):

1. Insert the I/O Server Infrastructure disk into a floppy drive A: or B:.
2. Select the **Run** command under the **Start** menu.
3. Type "A:SETUP" or "B:SETUP".
4. Click on **OK**.
5. Proceed as directed by the I/O Server Infrastructure Setup program.

To **uninstall** the I/O Server Infrastructure, start Control Panel, select "Add/Remove Programs" and select the "IO Server Infrastructure" from the list of available software products. Click on "Add/Remove…" and proceed as directed by the UnInstallShield program.

Note: *The I/O Server Infrastructure installation will be rejected if Wonderware FS2000 Common Components are already installed on same computer.*

Configuring the MICRO-DCI Controller

Before the FPM-DCI Communication Server is started, the MICRO-DCI controller must be initialized - do it according to the instructions in the User's Manual for that controller. Required communication parameters are:

1. Controller address - 0 to 31.
2. Parity - enable parity checking.
3. Communication must be enabled.
4. Byte stuffing - enable byte stuffing in response to messages.
5. Baud rate - 300 to 19200.

Not all controllers require all parameters.

For example: 53MC5000 controller is initialized by setting of following database parameters:

1. Parameter B01 must be configured for the desired controller address (0 to 31).
2. Parameter L256 must be set to logical "0" to enable parity checking.
3. Parameter L257 must be set to logical "0" to enable communication.
4. Parameter L258 must be set to logical "0" to enable "byte stuffing" in response messages.
5. Parameter B02 must be configured for the proper baud rate.

Configuring the FPM-DCI Server

After the FPM-DCI Server is initially installed and controllers are initialized, a small amount of configuration is required. Configuring the Server automatically creates an **FPM-DCI.CFG** file that holds all of the topic definitions entered, as well as the communication port configurations. This file will be placed automatically in the same directory in which **FPM-DCI.EXE** is located unless the path where the configuration file will be placed, is specified one via the */Configure/Server Settings…* command.
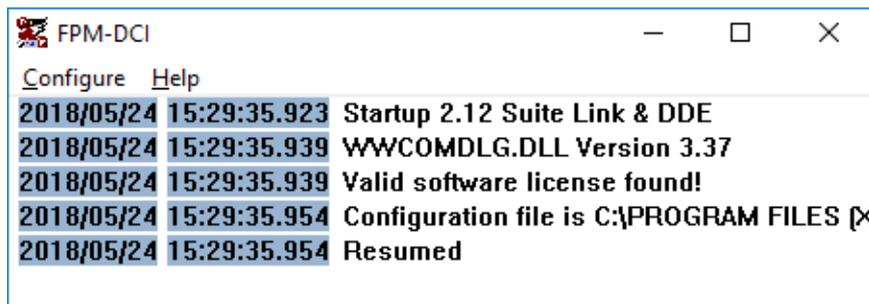
Server Settings Command

A number of parameters that control the internal operation of the Server can be set. In most cases, the default settings for these parameters provide good performance and do not require changing. However, they can be changed to fine-tune the Server for a specific environment.

To change the Server's internal parameters, invoke the */Configure/Server Settings…* command. The "Communication Server Settings" dialog box will appear:
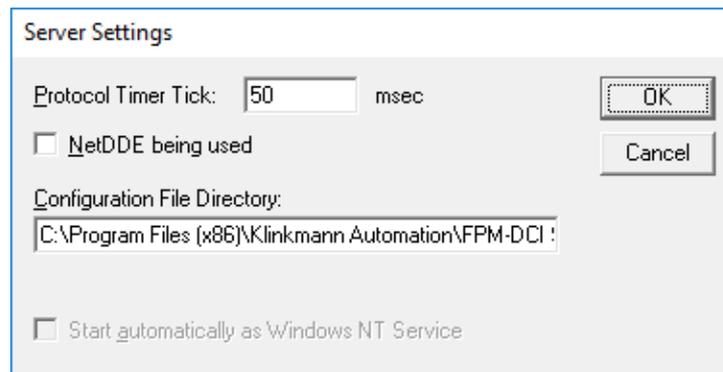
The following describes each field in this dialog box:

Protocol Timer Tick
This field is used to change the frequency at which the Server checks for work to do. At this frequency the Server tries to send one data request to controllers and receive one reply from its. If send/response cycle is too long then more than one activation of the Server is necessary in order to process it.

If the computer is busy or some other application takes over it then the Server is active less frequently than setting in the Protocol Timer Tick.
Note. The default value is 50. The minimum value is 10 milliseconds. If the value is lower than 10 entered, the Server uses 10 milliseconds.

NetDDE being used
Select this option if you are in network using NetDDE.

Configuration File Directory
The first field is used to specify the path (disk drive and directory) in which FPM-DCI will save its current configuration file. FPM-DCI will use this path to load the configuration file the next time it is started.
*Note. Only the "path" may be modified with this field. The configuration file is always named **FPM-DCI.CFG**. There is no limit to the number of configuration files created, although each must be in a separate directory. When using the FPM-DCI Server with **InTouch**, it is a good practice to place the configuration file in the application directory.*

Start automatically as Windows NT Service
Enabling this option will cause the FPM-DCI Server "Suite Link & DDE" version to start as a Windows NT service. Note – this feature is no more supported in newer MS Windows OS starting from Windows 7 / Windows Server 2008.

Windows NT offers the capability of running applications even when a user is not logged on to the system. This is valuable when systems must operate in an unattended mode. Enabling this option and rebooting the system will cause the Server to run as a Windows NT service. However, to view configuration information or to reconfigure the Server, the user must log on to the system. Any Server related problems that may arise such as missing adapter cards, licensing failures or device drivers not loading will not be visible to the user until a log on is performed. Disabling this option and rebooting the system will cause the Server to run as a Windows NT application program once again.

Notes:
*1. The **Start automatically as Windows NT Service** feature can be activated only with FPM-DCI Server "Suite Link & DDE" version. To start the FPM-DCI Server "OPC & DDE" version as Windows NT Service, refer to **Running FPM-DCI "OPC & DDE" version as Windows NT Service** section of this manual.*

*2. The Service Startup configuration can be changed by MS Windows NT **Control Panel/Services** configuration dialogs. The **Allow Service to Interact with Desktop** checkbox in "Service" dialog box <u>must be checked</u> (the "Service" dialog box can be invoked by pressing the "Startup" button on "Services" dialog box when Service **FPM-DCI_IOServer** is selected). If **Allow Service to Interact with Desktop** is not selected then FPM-DCI Server full functionality is not ensured (e.g. the Server configuration can not be changed, no message boxes will be displayed, etc.).*
When all entries have been made, click on **OK**.

Com Port Settings Command

This command is used to configure the communication port that will be used to communicate with the F&P MICRO-DCI controller. Invoke the */Configure/Com Port Settings…* command. The "Communication Port Settings" dialog box will appear:
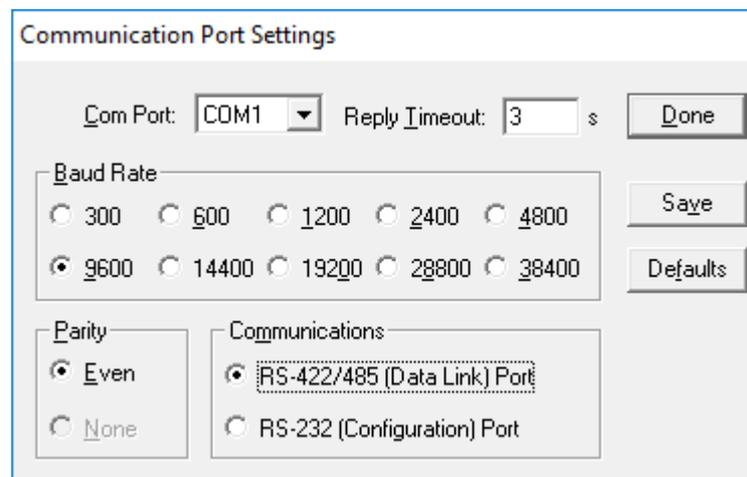
The following describes each dialog field in this dialog box:

Com Port
This field is used to select a communication port.
Note. The default Communication port is COM1.

Reply Timeout
This field is used to enter the amount of time (in seconds) all controllers using the selected communication port will be given to reply to commands from the Server.
Note: The default value of 3 seconds should be sufficient for most configurations.

Communications
Select the communication channel which is used on the F&P MICRO-DCI controller for communication. The "Data Link Port" is an RS-422/485 multi-drop port on the rear terminal board on the controller and supports the following communication parameters: 8 Data bits, 1 Even Parity and 1 Stop bit.

The 53MC5000 model controller is provided with second communication channel - "Configuration Port". It is an RS-232 port which is accessed via 5 pin mini-DIN connector located under the pull-down door on the front panel. "Configuration Port" primary is used to configure conntroller by Hand Held Configurer, but can be switched to binary mode by the Server. The "Configuration Port" always runs at 9600 Baud, 8 Data bits, No Parity.

Baud Rate
Select the Baud Rate setting which matches the setting chosen for the F&P MICRO-DCI controller. (Refer to the User's Manual for Baud Rate selection instructions). In "Data Link" mode baud rates from 300 to 9600 are available from standard RS-422/485

network; baud rates 19200, 28800 and 38400 are supported only with F&P SCADA adapter installed - in this case controller must be configured for corresponding controller baudrate.

Parity
The selected Parity must match the setting used in the communication channel.
Note. *The default communication settings are: 9600 Baud, 8 Data bits, 1 Even parity and 1 Stop bit.*

When all entries have been made, select **Done** to process the configuration for the communication port.

Saving FPM-DCI Configuration File
If the configuration file does not currently exist, or a new configuration path has been specified, the Server will display the "Save Configuration" dialog box:
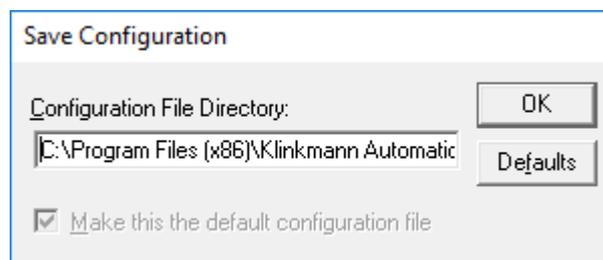
This dialog box displays the path where the Server is going to save the current configuration file. The path may be changed if necessary. Also, the path can optionally be recorded in the **WIN.INI** file by selecting the **"Make this the default configuration file"** option. Doing so, it will allow the FPM-DCI Server to find the configuration file automatically each time it is started.

Configuration File Location
When the FPM-DCI Server starts up, it first attempts to locate its configuration file, first by checking the **WIN.INI** file for a path which was previously specified. If the path is not present in the **WIN.INI** file, the Server will assume that the current working directory is to be used.

To start the Server from an application directory configuration file other than the default configuration file a special switch **(/d:)** is used. For example, invoke the */File/Run* command and enter the following:

FPM-DCI /d:c:\directoryname

Note: *There is no limit to the number of configuration files that may be created, although each must be in a separate directory.*

Topic Definition Command
The user provides controller with an arbitrary name which is used as the DDE topic for all references to the controller.

The following steps are taken to define the Topics attached to the F&P MICRO-DCI controller:

1.   Invoke the */Configure/Topic Definition…* command. The "Topic definition" dialog box will appear:
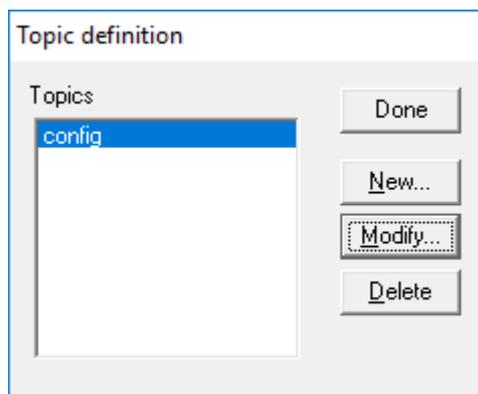
2. To modify an existing topic, select the topic name and click on **Modify….**. To define a new topic, click on **New….**. The "F&PM-DCI Topic Definition" dialog box will appear:

3. Enter the **Topic Name** which corresponds to the DDE Topic Name. (The DDE Topic Name is entered in the "DDE Access Name Definition" dialog box described in the chapter *Using the FPM-DCI Server with InTouch*.)

4. Click on the **Com Port** button to associate a communication port with the topic. (Additional topics may be associated with this communication port later.)
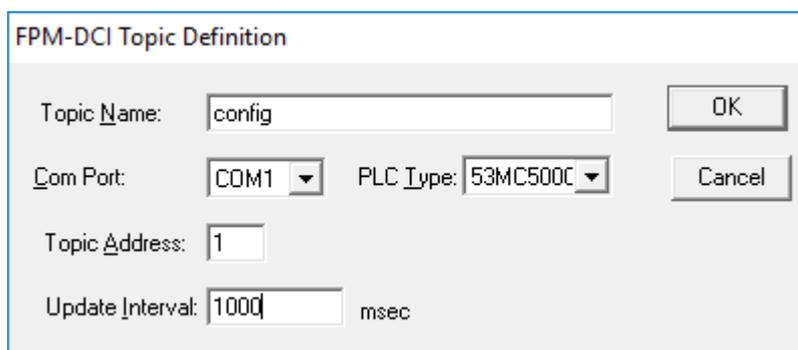   *Note. If the com port has been configured for the first time, the user will be prompted to save it in an existing directory.*

5. Choose the **PLC Type** - click on the respective combo box and make your choice from list box. There are the following choices: 53MC1000, 53MC2000, 53MC4000, KM2000, 53MC5000, 2340REC, 50XM1000, 53SL6000 and ABBES7000. Each controller type is characterized by a separate list of *Base addresses* of six data types (refer to the chapter **Item Names**). The tables below contain Base addresses, used by the Server to compute the actual addresses of the data elements in the memory of the controller.

	53MC1000	53MC2000	53MC4000	KM2000
L	000C H	0300 H	0032 H	0032 H
B	0000H	0200 H	0000 H	0000 H
C	0014 H	0320 H	0041 H	0041 H
H	00A1 H	0620 H	0299 H	0299 H
A	-	-	0393 H	0393 H

	53MC5000	2340REC	50XM1000	53SL6000	ABB ES7000
L	0500 H	00A4 H	0021 H	084B H	0028 H
B	0200 H	0000 H	0000 H	0800 H	0000H
C	0600 H	00B4 H	0025 H	085B H	002E H
H	0F00 H	0351 H	0351 H	09CF H	00B5 H
A	1400 H	05D1 H	008E H	-	-

If your controller is a modification of base model, you have compare your controller data Base addresses and corresponding values in the table - if they mismatch, you can't use this server.

6.   Enter the unique address of the F&P MICRO-DCI controller within 0 to 31. Corresponding value must be set into the controller database before Server start. *Note. The default address is 0.*

7.   Set the **Update Interval** field to indicate the frequency the items/points on this topic will be read (polled). *Notes. The default Update Interval is 1000 miliseconds. If topic communicates through "Configuration Port", Update Interval must be less than 30000 milliseconds to prevent switching back to standard mode.*

Item Names

Within the FPM-DCI Server, item/point naming depends on F&P MICRO-DCI controllers database parameters naming conventions. The tables below list the item/point names supported by the FPM-DCI Communication Server. The first table lists the item/point names exactly corresponding to the controllers database parameter names:

Item name	Description	DDE Tag Type	Value Range	Range
L	Binary bit	Discrete	0, 1	L000...L999
B	Positive integer	Integer	0...255	B000...B639
C	Real analog	Real	3.4*10**(-38)... 3.4*10**(+38)	C000...C639
H	High precision analog	Real	3.4*10**(-38)... 3.4*10**(+38)	H000...H127
A	Text string; 10 characters	Message		A000...A317
F	Text string; 5 characters	Message		F000...F447

Resolution of Real analog values is 0.5**15; resolution of High precision analog is 0.5**31.

The range of item/point depends on both the data and controller type:

	53MC1000	53MC2000	53MC4000	KM2000
L	L000...L063	L000...L255	L000...L119	L000... L119
B	B000...B011	B000...B127	B000...B049	B000...B049
C	C000... C046	C000...C255	C000...C199	C000...C199
H	H000...H010	H000...H036	H000...H049	H000...H049
A	-	-	A000...A009	A000...A009
F	-	-	-	-

	53MC5000	2340REC	50XM1000	53SL6000
L	L000...L999*	L000...L123	L000...L029	L000...L127
B	B000...B639	B000...B163	B000...B032	B000...B074
C	C000...C639*	C000...C222	C000...C014	C000...C371
H	H000...H127	H000...H127	H000...H011	H000...H250
A	A000...A317	A000...A090	-	-
F	F000...F447	-	-	-

	ABB ES7000
L	L000...L047
B	B000...B039
C	C000... C044
H	H000...H014
A	-
F	-

* Default range (data from 53MC5000 database). To increase the range to L0...L2047 and C0...C767, the WIN.INI setting **WholeAddressArea=1** can be used (see *WIN.INI entries* section below in this manual).

The FPM-DCI Server allows to operate with Binary bit (**L** type data) values as 8 bit (byte) or 16 bit (word) statuses. The following item/point names are used for this purpose:

Item name	Description	DDE Tag Type	Value Range	Range
E	8 bit (byte) status	Integer	0...255	E000...E992
W	16 bit (word) status	Integer	0...65535	W000...W992

The ranges of item/point are as follows:

	53MC1000	53MC2000	53MC4000	KM2000
E	E000...E056	E000...E248	E000...E112	E000...E112
W	W000...W048	W000...W240	W000...W096	W000...W096

	53MC5000	2340REC	50XM1000	53SL6000
E	E000...E992	E000...E112	E000...E016	E000...E120
W	W000...W992	W000...W096	W000	W000...W112

	ABB ES7000
E	E000...E040
W	W000...W052

The **L** type data points are packed to **E** and **W** type values as the following examples illustrate:

> **E0** value includes: L0, L1, L2, L3, L4, L5, L6, L7;
> **W16** value includes: L16, L17, L18, L19, L20, L21, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31.

Valid number **n** in item/point names are calculated as follows:

> for point **E:** n = 8 * k, where k = 0, 1, ... , 128;
> for point **W:** n = 16 * k, where k = 0, 1, ... , 64.

Valid point name examples are: E0, E40, W32, W96.
Such point names as E2, E43, W8, W33 *aren't allowed*!
Note. *The FPM-DCI Server allows to read and write any item/point value. Be careful when operate with memory areas, contained controller configuration parameters, do not corrupt them. For example, controller 53MC5000 configuration parameters are: **B1** (Data Link Address), **B2** (Data Link Baud Rate Index)**, L256** (Data Link - No Parity)**, L257** (Data Link - Disable)**, L258** (Data Link - No Byte Stuff).*

Item/Point Naming Examples
The following examples show the correct format for item/point names:
L01 - binary bit number 1;
B62 - positive integer number 62;
C2 - real analog word number 2;

H110 - high precision analog number 110;
A8 - 10 characters long text string number 8;
F84 - 5 characters long text string number 84;
E64 - 8 bit value with points L64 ... L71 included;
W32 - 16 bit value with points L32 ... L47 included;

Monitoring and Controlling Communication with a PLC

For each topic, there are following additional items offered by FPM-DCI Server to monitor and control the communication with PLC.

STATUS

For each topic, there is a built-in discrete item that indicates the state of communication with PLC. The discrete item (**STATUS**) is set to **0** when communication fails and set to **1** when communication is successful. The **STATUS** value is set to 0 after 3 consecutive unsuccessful retries to communicate with this PLC.

From **InTouch** the state of communication may be read by defining an I/O Discrete tagname and associating it with the topic configured for the PLC and using **STATUS** as the item name.

From **Excel**, the status of the communication may be read by entering the following formula in a cell:

=FPM-DCI|topic!STATUS

UPDATEINTERVAL

The **UPDATEINTERVAL** item is an Integer type Read/Write item used to access the currently set Update Interval (see *Topic Definition Command* section). It indicates the current requested update interval (in milliseconds). The value of this item can be read through DDE, Suite Link or OPC. Client can poke new values to this item. The range of valid values is from 10 to 2147483647 milliseconds. The value of zero indicates that no items on this topic are updated. The write commands are still executed (new values written to PLC) if **UPDATEINTERVAL** value is 0.

*Note: By poking a value of zero to the **UPDATEINTERVAL** item, a client can stop all update activities on the corresponding topic without having to deactivate the items.*

MAXINTERVAL

The **MAXINTERVAL** item is an Integer type Read Only item used to access the measured maximum update interval (in milliseconds) of all items for the corresponding topic for the last completed poll cycle. The range of valid values is from 0 to 2147483647 milliseconds.

The **UPDATEINTERVAL** and **MAXINTERVAL** items can be used to tune the performance of communication.

ITEMCOUNT

The **ITEMCOUNT** item is an Integer type Read Only item used to access the number of active items in the corresponding topic. The range of valid values is from 0 to 2147483647.

ERRORCOUNT
The **ERRORCOUNT** item is an Integer type Read Only item used to access the number of active items with errors in the corresponding topic. The range of valid values is from 0 to 2147483647.

ERRORITEMS
The **ERRORITEMS** item is an Integer type Read/Write (unique for each topic) used to access the total number of items with invalid item names (these items are rejected by Server) and items with valid names but with non-existing address in PLC. The **ERRORITEMS** value can be reseted by writing 0 to this item. The range of valid values is from 0 to 2147483647.

WRITECOUNT
The WRITECOUNT item is an Integer type Read Only item used to access the number of write commands (messages) waiting for execution. The range of valid values is from 0 to 2147483647.

For example, in following way the **WRITECOUNT** item can be used to avoid the increasing of memory occupied by not executed write commands:
- activate the hot link with **WRITECOUNT** item and start to monitor it;
- activate new write command (by poking new value) only if value of **WRITECOUNT** becomes equal to 0, e.g. all previous write commands are executed and memory occupied by them is freed.

SUSPEND
Special Read/Write Discrete Item **SUSPEND** may be used to control the communication with a separate topic. If application changes **SUSPEND** value from 0 to 1 then communication with topic is suspended. If **SUSPEND** value is changed back to 0 then communication with this topic is resumed.
*Note: If topic is suspended by setting **SUSPEND** value to 1, then Server rejects all new write values to this topic, i.e. no new write messages are created after **SUSPEND** value has changed from 0 to 1.*

Using the FPM-DCI Server with OPC Clients

The **"OPC & DDE"** version of FPM-DCI Server is accessible from OPC Clients.

There are following general steps needed to access an OPC item from FPM-DCI Server:

1. Run OPC Client application and select the "FPM-DCI OPC and DDE Server" from the list of available OPC Servers. If FPM-DCI Server currently is not running, it will start automatically.
2. Create a new group (or topic if Wonderware OPCLink application is used).
3. If OPC Client supports the validating of items, validate the item before adding it.
4. Add the item. Depending on OPC Client it can be done in several different ways, for example:
    a) By entering separately the access path to topic name (valid topic name configured in FPM-DCI Topic definition) and separately the item name.
    b) By entering the full path to item name in the format **TopicName.ItemName** where **TopicName** is the valid topic name configured in FPM-DCI Topic definition.
    c) By browsing the server address space.

By default the FPM-DCI Server is installed and used as a local OPC Server - both OPC Server and OPC Client reside on same computer. The FPM-DCI Server can run also as a remote OPC Server – in this case OPC Server and OPC Client are located on separate computers. Accessing the remote OPC Server is same as for local OPC Server, but some DCOM (Distributed COM) configuration is required before accessing the remote OPC Server. The DCOM configuration must be done both on OPC Server and OPC Client computers.

Configuring DCOM

To access FPM-DCI Server as a remote OPC Server, it is necessary to install FPM-DCI Server on both (OPC Server and OPC Client) computers. Also the DCOM must be configured on both computers.

After Server installation the System Administrator must configure DCOM by **Dcomcnfg.exe** (or Dcomcnfg32.exe for Win9x) system tool. This utility is located in the Windows system directory – e.g. in \WinNT\system32\ or \Win9x\system\.

Below is a simple example how to configure DCOM on NT Workstations for OPC Server computer (computer name *JohnB*) and on OPC Client computer (computer name *SteveL*).

Action	Remote OPC Server Computer name – *JohnB*	OPC Client Computer name – *SteveL*
Install the OPC Server.	✓	✓
Run Dcomcnfg.exe	✓	✓
Invoke **Default Properties** and set **Default Authentication Level** to *(None)*, **Default Impersonation Level** to *Impersonate.*	✓	✓
Select OPC Server from **Applications** list and click on the **Properties…** button. Click on the **Location** tab, uncheck **Run application on this computer**, check **Run application on the following computer** and browse the remote computer *JohnB*.		✓
Edit **Security** settings: 1) set the following **custom access permissions**: NETWORK, SYSTEM, *SteveL*; 2) set the following **custom launch permissions**: INTERACTIVE, SYSTEM, NETWORK, *SteveL*; 3) be sure the **Default Configuration Permissions** contain SYSTEM.	✓	
Click on the **Identity** tab and select **The interactive user**.	✓	

Before starting a remote OPC Server, be sure the OPC Server computer and OPC Client computer can access each other on the network. The "Remote Procedure Call" Service should be started on OPC Server computer.

Now remote OPC Server is accessible for OPC Client on computer *SteveL*. To allow the access to more OPC Clients, configure DCOM on each OPC Client computer.
The following table contains most frequent errors when configuring DCOM.

Error message	Possible reason
DCOM not installed	DCOM has not been installed
Server execution failed	1) OPC Server can not be started 2) **Identity** for OPC server not properly configured 3) OPC Server is not located on a local hard disk 4) OPC Server path in registry is too long or uses LFN (Long File Names) 5) DCOMCNFG **Location** is not set to **Run on this computer**.
Class not registered	OPC Server has not been registered
RPC server is unavailable	1) **Remote Procedure Call** service is not running on the OPC Server computer 2) Invalid computer name for remote OPC Server 3) Make sure TCP/IP is installed properly
Interface not supported	4) Permission not granted to OPC Client 5) Guest account disabled
Access is denied	6) DCOM security not configured properly 7) OPC Server application not located on local hard disk 8) SYSTEM account in DCOMCNFG must have **Access**, **Launch** and **Configure** privileges
Error 80070776	Network error - TCP/IP has not been configured properly
Catastrophic failure	1) Trying to access an object before it is created 2) Unhandled exception is occurs on the OPC Server
Not enough storage	SYSTEM account in DCOMCNFG must have **Access**, **Launch** and **Configure** privileges

Running FPM-DCI "OPC & DDE" version as Windows NT Service

To install FPM-DCI Server "OPC & DDE" version to run as **Windows NT Service**, the FPM-DCI Server must be started with command line parameter "/Service":

FPM-DCI /Service

After this the "FPM-DCI OPC & DDE Server" NT Service will be installed with Startup type "Manual". The Service Startup configuration can be changed by MS Windows NT *Control Panel/Services* configuration dialog boxes. The **Allow Service to Interact with Desktop** checkbox in "Service" dialog box must be checked (the "Service" dialog box can be invoked by pressing the "Startup" button on "Services" dialog box when Service **FPM-DCI OPC & DDE Server** is selected). If **Allow Service to Interact with Desktop** is not selected then FPM-DCI Server full functionality is not ensured (e.g. the Server configuration can not be changed, no message boxes will be displayed, etc.).

To use FPM-DCI Server "OPC & DDE" version as Windows NT Service you may need to configure DCOM. For details of configuring DCOM refer to *Configuring DCOM* section of this manual. If "FPM-DCI OPC & DDE Server" NT Service will be accessed only from local OPC clients (i.e. FPM-DCI Server will not be used as a remote OPC Server), then **custom access** and **launch permissions** "NETWORK" are not needed.

To <u>uninstall</u> "FPM-DCI OPC & DDE Server" NT Service, at first the Service must be stopped by *Control Panel/Services/Stop* and then FPM-DCI Server must be started manually with command line parameter "/DelService":

FPM-DCI **/DelService**

After this the FPM-DCI Server "OPC & DDE" version will be still registered and accessible to OPC clients.

Using FPM-DCI with OPCLink Server

The Wonderware OPCLink I/O Server (hereafter referred to as "OPCLink") is a Microsoft Windows application program that acts as a communication protocol converter and allows other Windows application programs access to data from local or remote OPC servers. OPCLink connects to OPC servers, converts client commands to OPC protocol and transfers data back to clients using DDE, FastDDE, or Suite Link protocols.

Please refer to ***Wonderware OPCLink Server and OPC Browser User's Guide*** for details how to install, start and use the OPCLink Server. The following information in this section covers only the most important points about using "OPC & DDE" version of FPM-DCI Server with OPCLink Server.

OPCLink Topic Definition

The **Topic Definition** option from OPC Link Configure menu is used to create, modify, or delete OPCLink topic definitions. If OPC Link will communicate with FPM-DCI Server then there must exist one or more topics defined for FPM-DCI Server. There are following important fields on the "OPCLink Topic Definition" dialog box:

Topic Name
Enter a unique name (e.g. **Controller1**) for the PLC in this field. If using InTouch then same Topic Name is to be entered in the "Add Access Name" dialog box when defining the Access Names for OPCLink Server in InTouch WindowMaker.

OPC Server Name
Select the name of the OPC server (**FPM-DCI.OPC_Server**) that will be used by this topic. The list box shows the registered OPC servers in the system.

OPC Path
Enter the name of the OPC path (e.g. **PLC01.**) used by this topic. This OPC path is the first part of a full OPC item name string common to all items that will be used in this topic. The available OPC paths for FPM-DCI Server can be obtained by clicking on "Browse" button (this allows to view the FPM-DCI Server's exposed address space).

Update Interval
Enter the frequency (in milliseconds) that the server will acquire data for the items/points associated with this topic. If 0 (zero) is entered here, OPCLink will not gather data from FPM-DCI Server.

Browse
Clicking on this button initiates the browsing through exposed address space of FPM-DCI Server. The starting addresses of each available data area and names of pre-defined (additional) items will appear on "Browse OPC items:" window in alphabetical order.

Accessing FPM-DCI Items via the OPCLink Server

The communication protocol addresses an element of data in a conversation that uses a three-part naming convention that includes the ***application name***, ***topic name*** and ***item name***. The following briefly describes each portion of this naming convention:

application name

The name of the Windows program (server) that will be accessing the data element. In the case of data coming from or going to FPM-DCI Server "OPC & DDE" version, the application portion of the address is **OPCLINK**.

topic name

Meaningful names are configured to identify specific devices (PLCs). These names are then used as the topic name in all conversations to that device (PLC). This must be same name as **Topic Name** entered in the "OPCLink Topic Definition" dialog box, for example, **Controller1**.
Note! You can define multiple topic names for the same PLC to poll different points at different rates.

item name

A specific data element within the specified topic. The OPCLink Server item syntax follows the following rules. The item names must start with:

> d – discrete value
> i – integer value
> r - real value
> m - message value

The item name added to the OPC path of the topic (without the heading type letter) must give a fully qualified OPC item name for the FPM-DCI Server. Some examples of possible item names acceptable by OPCLink Server/ FPM-DCI Server connection:

iB000 integer, address 0
dL028 discrete Bit, address 28

Using the FPM-DCI Server with Suite Link and DDE Clients

The **"Suite Link & DDE"** version of FPM-DCI Server is accessible from Suite Link clients (e.g. InTouch) and DDE clients (e.g. Excel). The **"OPC & DDE"** version of FPM-DCI Server is accessible from DDE clients.

Using the FPM-DCI Server with InTouch

To access items/points on the F&P MICRO-DCI controller from **InTouch**, the Access Names and Tag names should be defined in **WindowMaker**.

Defining the Access names

InTouch uses **Access Names** to reference real-time I/O data. Each Access Name equates to an I/O address, which can contain a **Node**, **Application**, and **Topic**. In a distributed application, I/O references can be set up as global addresses to a network I/O Server or local addresses to a local I/O Server.

To define the Access Names for controller in WindowMaker node invoke the */Special/Access Names…* command. The "Access Names" dialog box will appear.
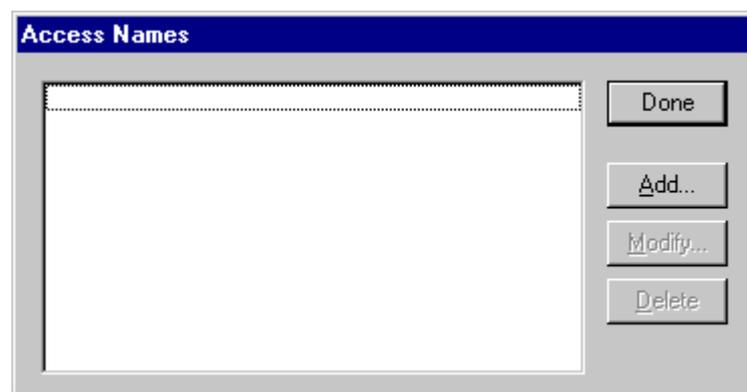
Click on **Add…**. The "Add Access Name" Dialog Box will appear:

*Note. When **Add** is selected, this dialog box will be blank when it initially appears. Data has been entered here to illustrate the entries which are made.*

The following three fields are required entries when entering a Access Name Definition:

Access Name
Enter the name which will be used by **InTouch** to refer to this Access Name. For simplicity use the same name that you will use for the **Topic Name** here.

Node Name
If the data resides in a network I/O Server, in the Node Name box, type the remote node's name.

Application Name
In the Application Name box, type the actual program name for the I/O Server program from which the data values will be acquired. In case the values are coming from the FPM-DC Server the "FPM-DC" is used. Do not enter the .exe extension portion of the program name.

Topic Name
Enter the name defined for the topic in FPM-DCI Server to identify the F&P MICRO-DCI controller the FPM-DCI Server will be accessing.
The Topic Name is an application-specific sub-group of data elements. In the case of data coming from a FPM-DCI Server program, the topic name is the exact same name configured for the topic in the FPM-DCI Server.

*Note: This will usually be the same as the "Access Name", although, if desired, they may be different. However, it must be the same name used when the topics were configured in section **Configuring the FPM-DCI Server**.*

Which protocol to use
Select the protocol (DDE or Suite Link) that you are using.

When to advise server
Select **Advise all items** if you want the Server program to poll for all data whether or not it is in visible windows, alarmed, logged, trended or used in a script. Selecting this option will impact performance, therefore its use is not recommended.

Select **Advise only active items** if you want the Server program to poll only points in visible windows and points that are alarmed, logged, trended or used in any script.

Click **OK** to accept the new Access Name and close the "Add Access Name" dialog box. The "Access Names" dialog box will reappear displaying the new Access Name selected in the list.

Click **Close** to close the "Access Names" dialog box.

Defining the Tag names
To define the Tagnames associated with the new "Access Name", invoke the */Special/Tagname Dictionary* command (in **WindowMaker**). The "Dictionary - Tag Name Definition" dialog box will appear:

Click on **New** and enter the **Tagname**. (The tagname defined here is the name **InTouch** will use. The FPM-DCI Server does not see this name.)

Select the tag type by clicking on the **Type** button. The "Tag types" dialog box will appear:

To access FPM-DCI items, the type must be **I/O Discrete**, **I/O Integer**, **I/O Real** or **I/O Message**. Select the DDE type. The "Details" dialog box for the tagname will appear:

Select the Access name for FPM-DCI by clicking on the **Access Name:...** button. The "Access Names" dialog box will appear:
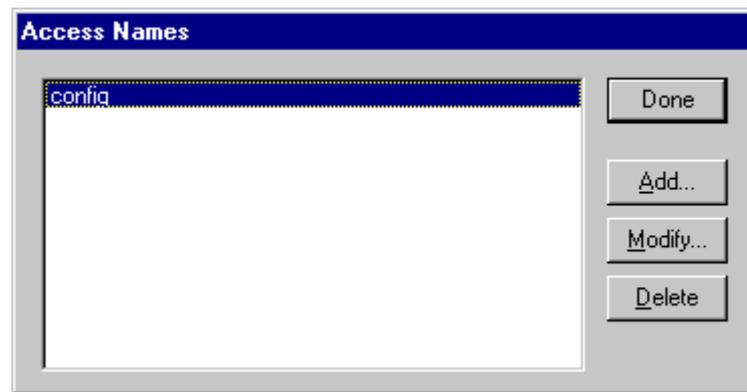
Select the appropriate Access Name and click on **Close**. (If the Access Name has not been defined as previously defined, click on **Add** and define the Access Name now.)

For integers and reals fill in the **Min EU**, **Max EU**, **Min Raw** and **Max Raw** fields. These fields control the range of values which will be accepted from the server and how the values are scaled. If no scaling is desired, **Min EU** should be equal to **Max EU** and **Min Raw** should be equal to **Max Raw**.

Enter the FPM-DCI item name to be associated with this tagname in the **Item** field in the "Details" box:

(Refer to the chapter *Item Names* for complete details.)

Where applicable, the **Use Tagname as Item Name** option may be selected to automatically enter the tag name in this field. ***Note:*** *The tag name can only be used if it follows the conventions listed in the **Item Names** section.*

Once all entries have been made, click on the **Save** button (in the top dialog box) to accept the new Tagname. To define additional Tagnames click on the **New** button. To return to the **WindowMaker** main screen, select **Close**.

Monitoring the Status of Communication with InTouch

InTouch supports built-in topic names called **DDEStatus** and **IOStatus** that are used to monitor the status of communications between the Server and InTouch. For more information on the built-in topic names DDEStatus and IOStatus, see your online "InTouch User's Guide".

The status of communication between the Server and InTouch can be read into **Excel** by entering the following DDE reference formula in a cell on a spreadsheet (in following examples **plc01** is the Topic Name configured for FPM-DCI Server):

=view|DDEStatus!plc01
or
=view|IOStatus!plc01

Notes on Using Microsoft Excel
Data from FPM-DCI topics can be accessed from Excel spreadsheets. To do so, enter a formula like the following into a cell on the spreadsheet.

='FPM-DCI'|topic!item

Note!
The server name should be surrounded by apostrophes, otherwise Excel will not recognise it properly. Sometimes, Excel requires also the topic and/or item/points to be surrounded by apostrophes if it is required by Excel syntax.

In the formula, **topic** must be replaced with one of the valid topic names defined during the Server configuration process. Replace **item** with one of the valid item/point names described in the ***Item Names*** section.

Reading Values into Excel Spreadsheets
Values can be read directly into Excel spreadsheets by entering a DDE formated formula into a cell, as shown in the following examples:

='FPM-DCI'|'topic-31'!B16
='FPM-DCI'|rack5!H92
='FPM-DCI'|'tank-2'!'E80'

Writing Values to FPM-DCI Points
Values can be written to the FPM-DCI Server by creating an Excel macro that uses the DDE **"POKE"** Command. The command is entered in Excel as follows:

channel=INITIATE("FPM-DCI","topicname")
=POKE(channel,"itemname",Data_Reference)
=TERMINATE(channel)
=RETURN()

The following describes each of the above **POKE** macro statements:

channel=INITIATE("FPM-DCI ","topicname")
Opens a channel to a specific topic name (defined in the Server) in an application with name FPM-DCI (the executable name less the .EXE) and assigns the number of that opened channel to **channel**.

*Note: By using the **channel=INITIATE** statement the word **channel** must be used in the **=POKE** statement instead of the actual cell reference. The **"applicationname"** and **"topicname"** portions of the formula must be enclosed in quotation marks.*

=POKE(channel,"itemname", Data_Reference)
POKEs the value contained in the **Data_Reference** to the specified item name (actual location in the FPM-DCI PLC) via the **channel** number returned by the previously executed **INITIATE** function. **Data_Reference** is the row/column ID of the cell containing the data value. For **"itemname"**, use some of the valid item names described in the **Item Names** section.

=TERMINATE(channel)
Closes the channel at the end of the macro. Some applications have a limited number of channels. Therefore they should be closed when finished. **Channel** is the channel number returned by the previously executed **INITIATE** function.
The **"TERMINATE"** macro should have sufficient delay to ensure that the **"POKE"** has been executed. (Refer to the Excel Manual for further details.)

=RETURN()
Marks the end of the macro.

The following is an example of Excel macro used to poke value from cell B2 to topic **plc01** item **B0**:

PokeMacro -Ctrl a
=INITIATE("FPM-DCI","plc01")
=POKE(A2,"B0",B2)
=ON.TIME(NOW()+0.01,"TerminateDDEChannel")
=RETURN()

TerminateDDEChannel
=TERMINATE(A2)
=RETURN()

Note: Refer to the Microsoft Excel manual for complete details on entering Remote Reference formulas for cells

Troubleshooting

WIN.INI entries

The first time you run the FPM-DCI Server configuration, most of the items in the following list will automatically appear in the WIN.INI file. It is usually in the MS Windows directory (usually C:\WINNT). It is an ASCII file and can be altered manually if you wish with any text editor, for example MS Windows Notepad (d*o not use a program that formats text, such as MS Word or Write unless the file is saved as DOS text*). The following is a typical entry for the FPM-DCI Server:

[FPM-DCI]
ConfigurationFile=C:\FPM-DCI
WinIconic=0
WinFullScreen=0
WinTop=268
WinLeft=584
WinWidth=384
WinHeight=112
ProtocolTimer=50
Verbose=0
ShowEvents=1
ShowSend=0
ShowReceive=0
ShowErrors=1
ShowRejectedWrites=1

DumpScreen=1
LogScreen=0
LogFile=0
SlowPollRetries=3
SlowPollInterval=60

SlowPollRetries and SlowPollInterval

There are two entries (**SlowPollRetries** and **SlowPollInterval**) which affect the performance of FPM-DCI Communication Server if the "Data Link" port is used and if client application requests data from some disconnected Controllers.

The **SlowPollRetries** entry is used to enter the number of consecutive error retries for one topic. If after **SlowPollRetries** there is still no successful response from PLC, then this topic is changed to *slow poll* mode. The WIN.INI file **SlowPollInterval** entry is used to enter the slow poll mode update interval (in seconds).

The default values (they are used if WIN.INI file does not contain these entries) are **SlowPollRetries** equal to 3and **SlowPollInterval** equal to 60 seconds.

For example, the following entries can be used to specify that slow poll mode 2 minutes will start after 5 consecutive unsuccessful retries:

SlowPollRetries=5
SlowPollInterval=120

The communication state item (STATUS) is set to 0 after **SlowPollRetries** unsuccessful retries.

ShowRejectedWrites

The **ShowRejectedWrites** entry is used to enable the logging of rejected write messages. This option can be useful when communication with a separate topic (PLC) is suspended by SUSPEND item (see *Item Names* section) and the Server rejects each write to this topic (PLC). If **ShowRejectedWrites=1** then information about each rejected write value is reported to WWLogger and (or) to FPM-DCI Internal Logger. If **ShowRejectedWrites=0** (default) then Server rejects each write to suspended topic(s) without logging any information.

WholeAddressArea

As default, for 53MC5000 controllers the FPM-DCI Server uses the default addresses ranges L000...L999 and C0...C639 (data from 53MC5000 database) . To increase the range to L0...L2047 and C0...C767, the following setting:

WholeAddressArea=1

can be added to WIN.INI file [FPM-DCI] section.

Troubleshooting menu

The following debugging choices are appended to the Server's System Menu (the menu that appears when you click on the icon of the Server's title bar):

Suspend Protocol/Resume Protocol - these choices permit you to turn protocol processing on and off, what means that you can suspend access to Fischer&Porter MICRO-DCI controller(s).

Show Send - if checked then all outgoing data is displayed in hexadecimal format.

Show Receive - if checked then all incoming data is displayed in hexadecimal format.

Note. If you check Show Send or Show Receive then debug output grows very fast and it is possible that computer can become very slow..

Show Errors - if checked then all information about errors is displayed.

Show Rejected Writes - if checked then the Server displays information about unscccessful writes when communication with topic is suspended by item SUSPEND;

Verbose - if checked then additional debug information is displayed and saved in the log file. This option can be useful only for debugging purposes.

Dump - all information about ports, topics, messages and data items are sent to logger. This can be use to find out how many messages are actually sent to the PLC(s).

Dump Screen - if checked then information about active messages are displayed on the Server main window. This also can be used to find out how many messages are actually sent to the PLC(s).

All debug information (except **Dump Screen**) are displayed through the Wonderware Logger, which must be active for these commands to work.

Log Screen - if checked last 10 lines of debug information (except **Dump** and **Dump Screen**) messages are displayed on the Server main window. This may be usefull when the Wonderware Logger is not present.

Log File - if checked all debug information (except **Dump Screen**) messages are written to file. The file is named as: D_YYYYMMDD.LOG, where YYYY is a year, MM - month, DD - day. This may be usefull when the Wonderware Logger is not present.
If Wonderware Logger is present all debug information is going both to Wonderware Logger and to file.

KLINKMANN
FPM-DCI Communication Server
Revision History

Aug 94   Rev 1.0   First Release
Sep 96   Rev.1.1   Modification of manual contents
                         Chapters:
                         Files on the FPM-DCI Distribution Diskette
                         Installing the FPM-DCI Communication Server
Aug 97   Rev.1.2   Minor changes. Manual file name changed.
Feb 98   Rev.1.3   The 32-bit version of Server made. Dialogs changed.
                         Special item "SUSPEND" added.
Dec 98   Rev.1.4   Added 53SL6000 model support.
Apr 2000   Rev 1.5   Added OPC and SuteLink
Jan 2001   Rev 1.6   OPC compliance information added
Jul 2001   Rev 1.7   Notes on Using Microsoft Excel section modified
Mar 2002   Rev 1.8   Installation from CD information added.
Sep 2011   Rev 1.9   The ABB ES7000 device added – "Overview", "Topic
                         Definition Command" and "Item Names" sections modified.
May 2018   Rev 1.10   Server name changed from FPM-DCI to FPM-DCI.