PROFACE GP
Serial and Ethernet Communication Server

for Microsoft Windows
and InTouch Applications

User Manual
Ver 1.x Rev 1.2
DR410 10
DR410 11

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PROFACE GP Serial and Ethernet Communication Server

Overview

The **PROFACE GP Serial and Ethernet Communication Server** (hereafter referred to as the “PROFACE GP Server” or “PROFACE GP” or “Server”) is a Microsoft Windows application program that acts as a communication protocol server and allows other Windows application programs to access to data from Digital PROFACE GPx-70 Series Graphic Panels (hereafter referred to as the **GP**s) using serial (MTOM Extended mode) and Ethernet communications. Any Microsoft Windows program that is capable of acting as a **DDE**, **FastDDE**, **SuiteLink** or **OPC** *Client* may use the PROFACE GP Server.

There are two different PROFACE GP Server versions described in this manual:
- Server version (ordering number DR 410 10) supporting SuiteLink, FastDDE and DDE protocols; this version hereafter is referred to as the “***Suite Link & DDE***” version.
- Server version (ordering number DR 410 11), 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 all cases the name of Server executable file is **PROFACEGP.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 environ ment 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 our industry, this extension is being pushed to its performance constraints in distributed environments. The PROFACE GP 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 PROFACE GP 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 PROFACE GP 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 PROFACE GP 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 PROFACE GP Server "OPC & DDE" version is implemented by ***Wonderware I/O Server Toolkit*** ver. 5.0 (008).

Accessing Remote Items via the PROFACE GP 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 PROFACE GPs, the application portion of the address is **PROFACEGP**.

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, **Node1**.
Note. *You can define multiple topic names for the same device to poll different items at different rates.*

item name
Item is a specific data element within the specified topic. For the PROFACE GP Server, an item can be a flag, input, output, register, timer, etc. in the PROFACE GP (the item/point names are fixed by the PROFACE GP Server as described in the ***Item Names*** section).
Note. *In some cases, the term "point" is used interchangeably with the term "item".*

Installing the PROFACE GP Server

Installing the Server

The PROFACE GP Server installation package can be supplied:

1. As a self-extracting archive (41010xxx.EXE for “Suite Link & DDE” version or 41011xxx.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 PROFACE GP Server from the self-extracting archive, run the 41010xxx.EXE or 41011xxx.EXE and proceed as directed by the PROFACE GP Server Setup program.

To **install** the PROFACE GP Server from CD or distribution disks, on MS Windows (NT, 2000, XP or 9x):

1. Insert the CD with Klinkmann Software into CD drive or insert the PROFACE GP 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 “PROFACE GP SL and DDE Server” or “PROFACE GP OPC and DDE Server” and click on “Setup…”.
5. Proceed as directed by the PROFACE GP Server Setup program.

Notes.

1. *If installing the PROFACE GP Server “OPC & DDE” version on Windows 95 then DCOM (Distributed COM) must be installed on Windows 95 before installing the PROFACE GP 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 PROFACE GP Server the DCOM must be configured). See* ***Configuring DCOM*** *section in this manual for 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 PROFACE GP Server “OPC & DDE” version. Otherwise there can be problems with PROFACE GP Server registration as OPC server. If during the PROFACE GP Server “OPC & DDE” version installation some warning messages about shared DLLs are displayed, then it is quite possible the PROFACE GP Server registration as OPC server failed. In this case after system reboot the PROFACE GP Server registration can be done by starting the PROFACE GP Server manually with special command line parameter added: “PROFACEGP/Regserver”.*

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

PROFACEGP.EXE	The PROFACE GP Server Program. This is a Microsoft Windows 32-bit application program.
PROFACEGP.HLP	The PROFACE GP Server Help file.
PROFACEGP.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 PROFACE GP Server, start Control Panel, select “Add/Remove Programs” and select the “PROFACEGP SL and DDE Server” or “PROFACEGP 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 PROFACE GP 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 PROFACE GP 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 PROFACE GP 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 PROFACE GP Server "Suite Link & DDE" version and these infrastructure files must be install prior to executing the PROFACE GP Server.*
3. *The HASP key is needed for full time running of PROFACE GP Server. The HASP Driver setup is performed during the Server setup. Without HASP Driver installed the PROFACE GP 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 9x):

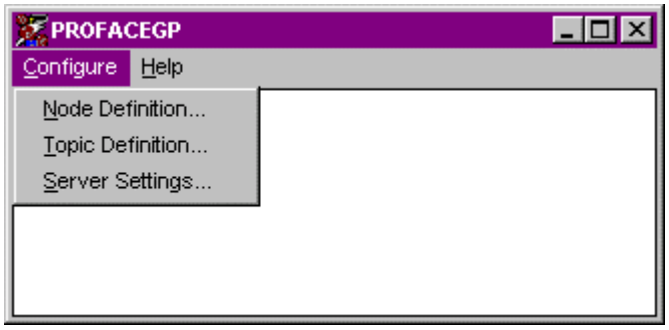
1. Insert the I/O Server Infrastructure disk into a floppy drive A: or B:.
2. Select the **Run** command under the **Start** menu.
3. Type "A:SETUP" or "B:SETUP".
4. Click on **OK**.
5. Proceed as directed by the I/O Server Infrastructure Setup program.

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 PROFACE GP Server

After the PROFACE GP Server is initially installed, a small amount of configuration is required. Configuring the Server automatically creates a **PROFACEGP.CFG** file, which holds all the topic definitions, entered, as well as the communication port configurations. This file will automatically be placed in the same directory in which **PROFACEGP.EXE** is located unless the path where the configuration file will be placed is a specified by the */Configure/Server Settings…* command.

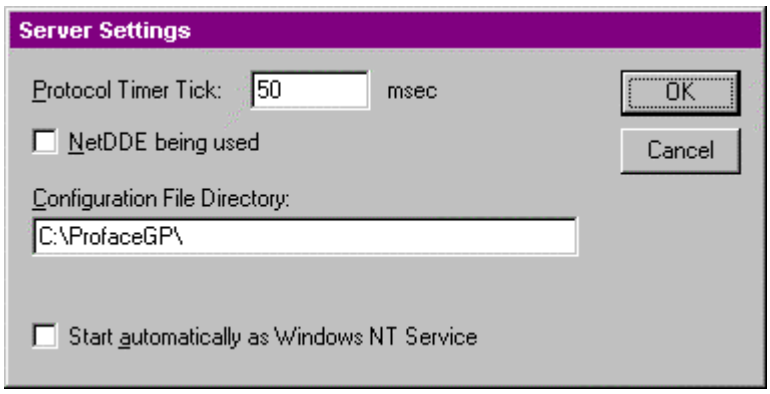
To perform the required configurations, start up the PROFACE GP. If the Server starts up as an icon, double-click on the icon to open the server's window. To access the commands used for the various configurations, open the */Configure* menu:



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 a 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 "Server Settings" dialogue box will appear:



The following describes each field in this dialogue box:

Protocol Timer Tick

This field is used to change the frequency at which the Server is continuously activated (the Server checks for work to do). At this frequency the Server tries to send one data request to GP and receive one reply from GP. If the send/response cycle is too long then more than one activation of Server is necessary to process it. If computer is very busy or some other MS Windows application is taking over the computer then the Server is activated rarely than setting in the **Protocol Timer Tick**.

Note: *The default value is 50 milliseconds. The minimum value is 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 PROFACE GP will save its current configuration file. PROFACE GP will use this path to load the configuration file the next time it is started.

Notes.

1. *Only the "path" may be modified with this field. The configuration file is always named* ***PROFACEGP.CFG.***
2. *There is no limit to the number of configuration files created, although each must be in a separate directory. When using the PROFACE GP 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 PROFACE GP Server “Suite Link & DDE” version to start as a Windows NT service.

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.

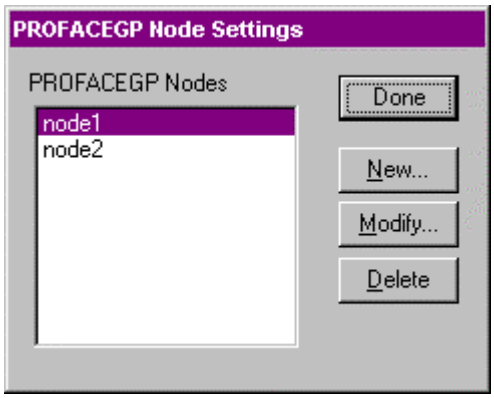
Notes.

1. *The **Start automatically as Windows NT Service** feature can be activated only with PROFACE GP Server "Suite Link & DDE" version. To start the PROFACE GP Server "OPC & DDE" version as Windows NT Service, refer to **Running PROFACE GP "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" dialogue box must be checked (the "Service" dialogue box can be invoked by pressing the **Startup…** button on "Services" dialogue box when Service **PROFACEGP_IOServer** is selected). If **Allow Service to Interact with Desktop** is not selected then PROFACE GP Server full functionality is not ensured (e.g. the Server configuration can not be changed, no message boxes will be displayed, etc.).*

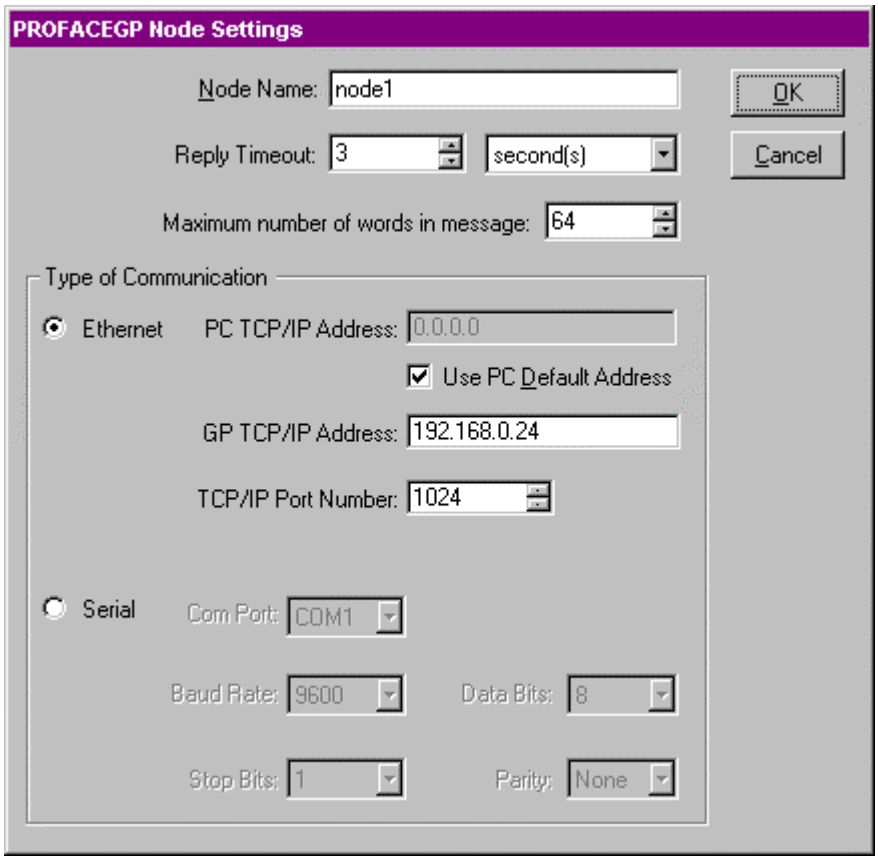
When all entries have been made, click on **OK**.

Node Definition Command

To configure the Node used for communications with GP(s), invoke the */Configure/Node Definition...* command. The "PROFACEGP Node Settings" first dialog box will appear:



To modify or examine an existing Node, select the topic name and click on **Modify**. To define a new Node, click on **New**. The "PROFACEGP Node Settings" second dialog box will appear:



The following describes each dialog field in this dialog box:

Node Name

Enter the Node name and later use it in *Topic Definition*.

Reply Timeout
This field is used to enter the amount of time, all GP units using the selected communication port, will be given to reply to commands from the Server.
The default value of “Reply Timeout” is 3 seconds.

Maximum Number Of Words In Message
Enter the capacity of response message. Maximum number of words that will be requested by one read command. This parameter can be reduced in case of ‘noisy’ communications or can be increased in case of ‘fast and clear’ communications. Default value is 64 words.

Type Of Communications
Choose the type of communications that will be used for data exchanging between PC and GP(s). There are two types of communications which can be defined in the “Proface Node Settings” window – **Ethernet** or **Serial**.

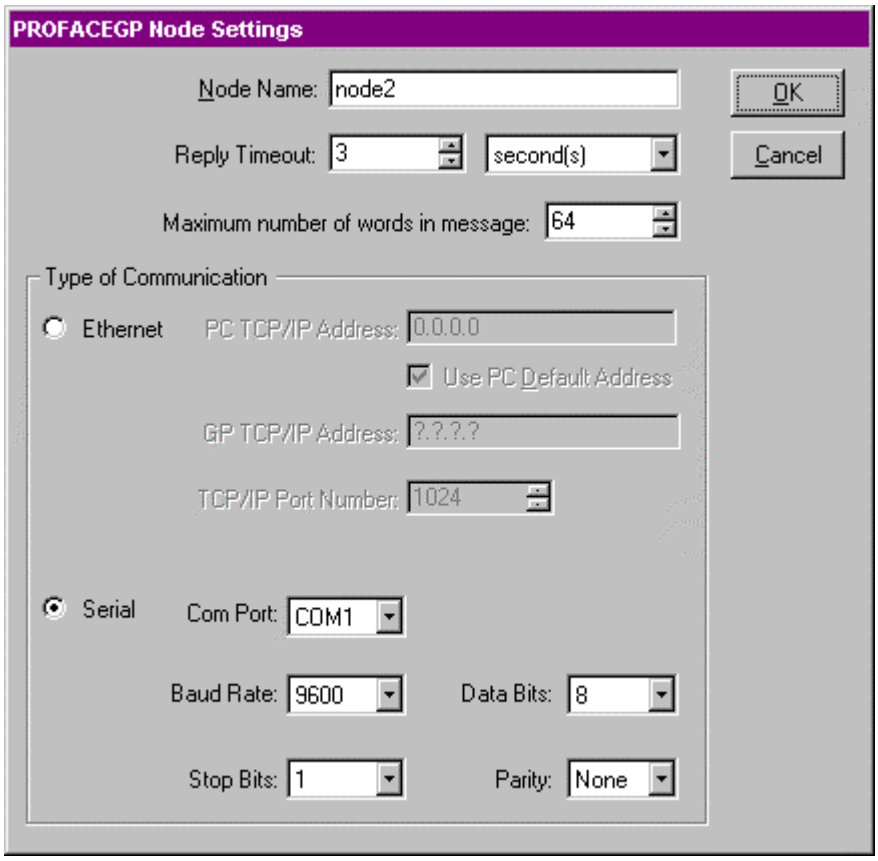
The following can be configured only for **Ethernet** communications:

PC TCP/IP Address
Enter the computer(PC) Internet Address (IP Address) if it has more than one. If there is only one Internet Address for computer then **Use Default Address** can be checked to use this IP Address. If Computer is multi-homed (more than one Internet Address used) and **Use Default Address** is checked then it is impossible to know which IP Address must be used.
Note: *Address must be entered regarding the following mask* ***xxx.xxx.xxx.xxx***

GP TCP/IP Address
Enter the Graphic Panel(GP) Internet Address (TCP/IP Address). This address must be equal to address configured on the GP offline configuration screen.
Note: *Address must be entered regarding the following mask* ***xxx.xxx.xxx.xxx***

GP TCP/IP Port Number
Enter the Graphic Panel(GP) TCP/IP Port Number used for communications. This port number must be equal to port number configured on GP offline configuration screen.

The following can be configured only for **Serial** communications:



Com Port
This field is used to select the computer(PC) communication port.

Baud Rate
The selected Baud Rate must match the settings used in connected GP(s).

Stop Bits
The selected Stop Bits must match the settings used in connected GP(s).

Data Bits
The selected Data Bits must match the settings used in connected GP(s).

Parity
The selected Parity must match the settings used in connected GP(s).

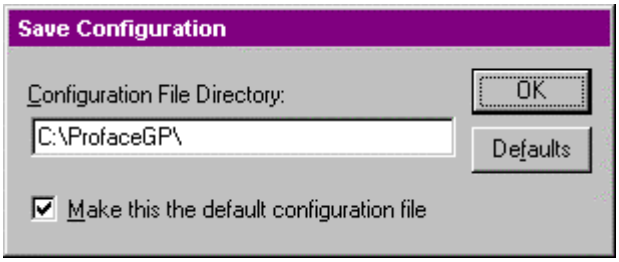
Once all entries have been made, click on **OK** to process the configuration for the Node. The "PROFACEGP Node Settings" first dialog box will appear again.

Click on **Done** when configuration for all Nodes has been performed.

Note: *If this is the first time the Nodes have been configured, the user will be prompted to save configuration to an existing directory.*

Saving PROFACE GP 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" dialogue box:



This dialogue 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 PROFACE GP Server to find the configuration file automatically each time it is started.

Configuration File Location

When the PROFACE GP Server starts up, it first attempts to locate its configuration file by, first checking the **WIN.INI** file for a path that 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 **Start/Run** command and enter the following:

PROFACEGP /d:c:\directoryname

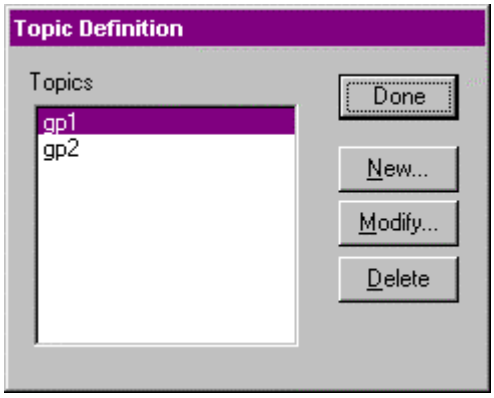
Note. *There is no limit to the number of configuration files that may be created, although each must be in a separate directory.*

Topic Definition Command

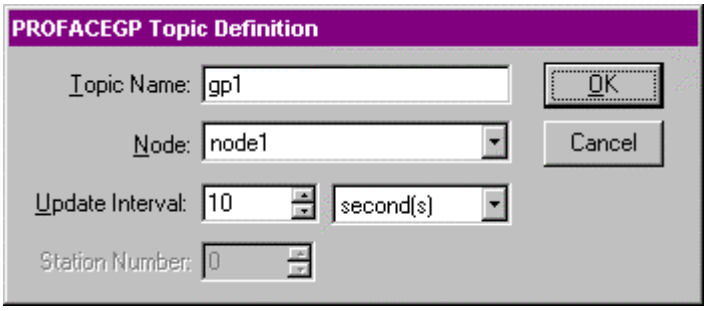
The user provides each connected GP with an arbitrary name that is used as the Topic Name for all references to this GP.

The following steps are taken to define the topics (PROFACE GPs) to be accessed from PROFACE GP Server:

Invoke the *Configure/Topic Definition…* command. The "Topic Definition" dialog box will appear:



To modify an existing topic, select the topic name and click on **Modify**. To define a new topic, click on **New**. The "PROFACEGP Topic Definition" dialog box will appear:



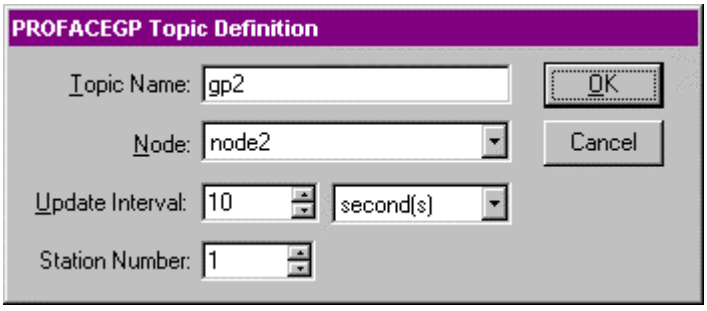
Topic Name
Enter the **Topic Name**.
Note: *If using **InTouch**, the same Topic Name is to be entered in the "Add Access Name" dialog box described in the **Using the PROFACE GP Server with InTouch** section.*

Node Name
Select the Node to associate it with the topic. Additional topics (PROFACE GPs) may be associated with the same Node at a later time.

Update Interval
Set the **Update Interval** field to indicate the frequency the items/points on this topic (GP) must be read (polled); at this frequency all this topic data request commands will be sent to the GP and replies must be received and processed.

Station Number
Enter the GP station number to communicate with. Must be same as configured on GP offline configuration screen.

Note: *This option is enabled only in case of serial type of communications used for currently selected Node.*



Once all entries have been made, click on **OK** to process the configuration for the Topic. The "Topic Definition" dialog box will appear again.

Select **Done** when configuration for all Topics has been performed.

Item Names

The PROFACE GP Server can access up to 4096 words from each connected GP memory. The supported item/point types are Discrete, Integer and Message (string). The addresses for items can overlap, e.g. item L16 overlaps with items W16 and W17 and item W16 overlaps with items D1600, D1609 and D1615. It is recommended to use consecutive addresses for item/point naming (for example, W16, W17, W18, etc.). This will greatly increase the performance of PROFACE GP Server.

The table below lists the item/point names supported by the PROFACE GP Server:

Item name	Description	Tag Type	Value Range	Range
Dnbb	Bit	Discrete	0,1	n = 0 to 4095, b = 00 to 15
Wn	Word	Integer (unsigned)	0...65535	n = 0 to 4095
WnS	Word	Integer (signed)	-32768...32767	n = 0 to 4095
Ln	Long	Integer (unsigned)	0...2147483647	n = 0 to 4095
LnS	Long	Integer (signed)	-2147483648...2147483647	n = 0 to 4095
SnII	String	Message		n = 0 to 4095 l = 1,80

Notes:

*1. Also lower case letters **d**, **w**, **l** and **s** can be used as item name first character and **s** as suffix.*

2. All addresses are decimal.

*3. For Message type Items the last 2 digits (**ll**) represent the length of the string.*

*4. For Discrete Items the last 2 digits (**bb**) represent the bit position inside the word. The bit position can be from 00 to 15 (e.g. 01 and 09 are valid, 1 and 9 - not valid bit positions).*

*5. The first 20 words (**n** values from 0 to 19) must be used with care, because this area corresponds to the GP System Data Area (see DIGITAL's **"GP-PRO/PB3 PLC Connection Manual"**, Chapter 3 "Memory Link Communication"). For example, item W0 contains the number of currently displayed screen and item W8 can be used for switching to some other screen.*
6. The sending of interrupt data (System Data Area address 13) from GP to host computer is not supported.

If some floating point (real) data must be displayed on the GP screen then before sending to the Server this floating point value must be converted to integer value with fractional digits included. For example, if some floating point value must be displayed on the GP screen and two digits must be displayed after the decimal point then before sending to the Server this floating point value must be multiplied with 100 and then converted to integer (e.g. if floating point value is 1.05 then integer value 105 must be sent to the Server). In this case the corresponding GP-PRO2 tag's *Fractional digit* parameter must be set to 2 (see the description of N-Tags and K-Tags in *DIGITAL's **"GP-PRO/PB3 Tag Reference Manual"***).

For each Topic there is also a built-in discrete item (**STATUS**) which indicates the state of communication with the GP. This discrete item is set to **0** when communication with the GP fails and set to **1** when communication is successful.

Monitoring and Controlling Communication with a PROFACE GPs

For each topic, there are following build-in items offered by PROFACE GP Server to monitor and control the communication with PROFACE GPs.

STATUS
For each topic, there is a built-in discrete item that indicates the state of communication with GP. 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 GP.

From **InTouch** the state of communication may be read by defining an I/O Discrete tagname and associating it with the topic configured for this GP 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:

=PROFACEGP|topic!STATUS

where **topic** is the name of topic (e.g. Node1) configured for GP.

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.

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 Only (unique for each topic) used to access the total number of items with invalid item names (these items are rejected by Server). 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.*

KEEPALIVE
For each Topic the special Integer Read/Write item **KEEPALIVE** can be activated. The value of **KEEPALIVE** changes from 0 to 1 or from 1 to 0 at some timer interval (default is 10 seconds, this default value can be changed by adding special entry in WIN.INI file [PROFACEGP] section, see *WIN.INI entries* section later in this manual). This timer interval can also be changed at run-time by writing any new value (equal to new timer interval, in seconds) to **KEEPALIVE** item. After this writing the new timer interval will start, but **KEEPALIVE** item value still will change from 0 to 1 and back. The **KEEPALIVE** item can be used to create artificial delivery of new data from Server to client application if needed (for example, if accessing to GP from Wonderware IndustrialSQL Server and if some time no new values are received from PLC).

Item/Point Naming Examples

The following examples show the **valid** item names:

D104, d109, d110	Bits 4, 9 and 10 of Word 1
D1600, D1609, D1615	Bits 0, 9 and 15 of Word 16
d101210	Bit 10 of Word 1012
W0, w1, W183, w1000, W1023	Words
w0S, W1S, w183S, W1000S, w1023S	Signed Words
L10, l100, L611	Longs
l10S, L100S, l511S	Signed Longs
S8008, s10035, S53480	Strings (max. length 8, 35, and 80 characters)

The following examples show the **invalid** item names:

D0, D1, D8, D15	Too few digits for Address and Bit position
D116, D23320, D100090	Bit position is out of range
d602400, D800015	Address is out of range
W4096, W7050S	Address is out of range
L4301, l4999S	Address is out of range
S4, s22	Too few digits for Address and Max. length
S2200, S6081	Max. length of string is out of range
U22, m001	Invalid item type

Using PROFACE GP Server with Suite Link and DDE Clients

The “Suite Link & DDE” version of PROFACE GP Server is accessible from Suite Link clients (e.g., InTouch) and DDE clients (e.g., Excel).

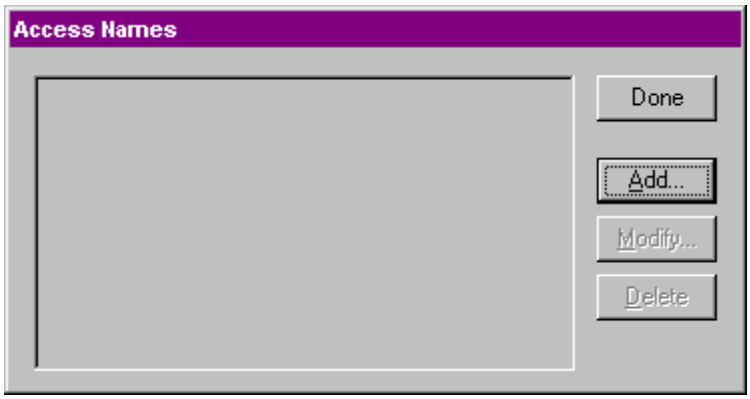
Using the PROFACE GP Server with InTouch

To access to operands on PROFACE GPs from **InTouch**, the Access Names and Tag names should be defined in **WindowMaker.**

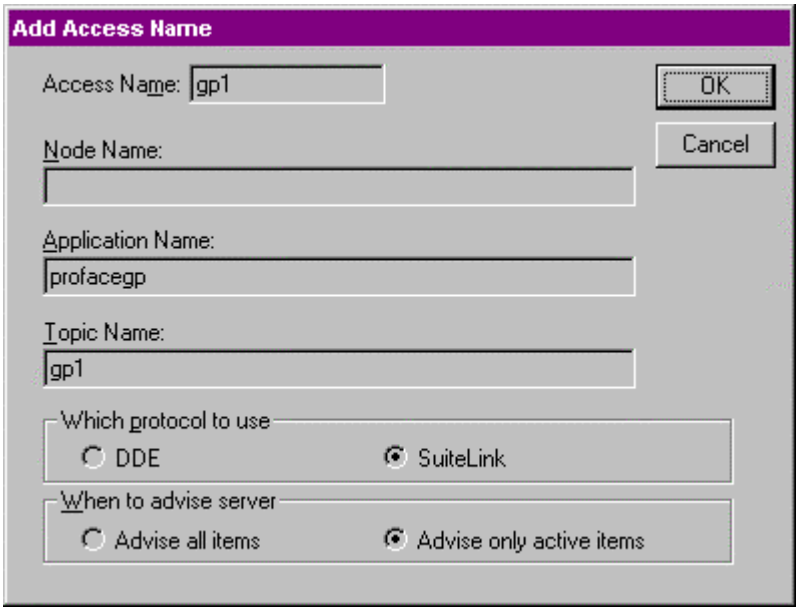
Defining the Access names

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 in WindowMaker node invoke the */Special/Access Names...* command. The "Access Names" dialogue box will appear.



Click on **Add…**. The "Add Access Name" dialogue box will appear:



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

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

Access Name
Enter an arbitrary name that will be used by **InTouch** to refer to the topic. For simplicity, it is recommended that the name defined for the topic in PROFACE GP Server also be to be used 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 PROFACE GP Server the PROFACE GP is used. Do not enter the .exe extension portion of the program name.

Topic Name
Enter the name defined for the topic in the PROFACE GP Server to identify the topic the PROFACE GP Server will be accessing. The Topic Name is an application-specific sub-group of data elements. In the case of data coming from a PROFACE GP Server program, the topic name is the exact same name configured for the topic in the PROFACE GP 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 PROFACE GP Server**.*

Which protocol to use
Select the protocol (**DDE** or **SuiteLink**) 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.

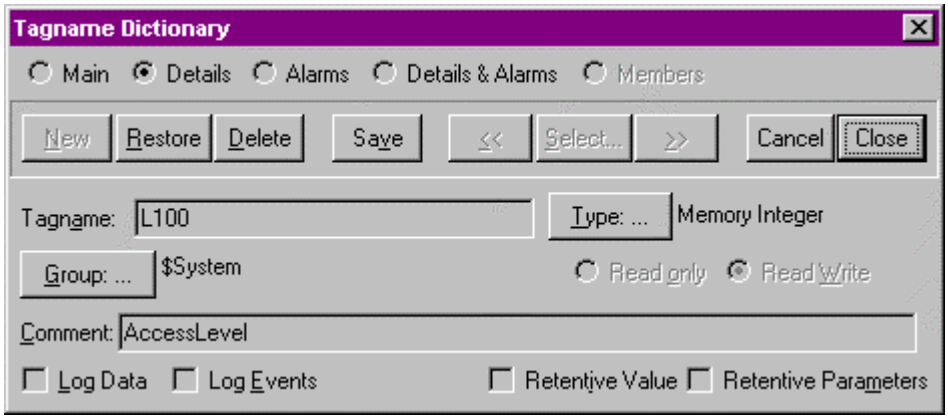
Select **Advise only active items** if you want the Server program to poll only points in visible windows and points that are alarmed, logged, trended or used in any script.

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

Click **Close** to close the “Access Names” dialogue box.

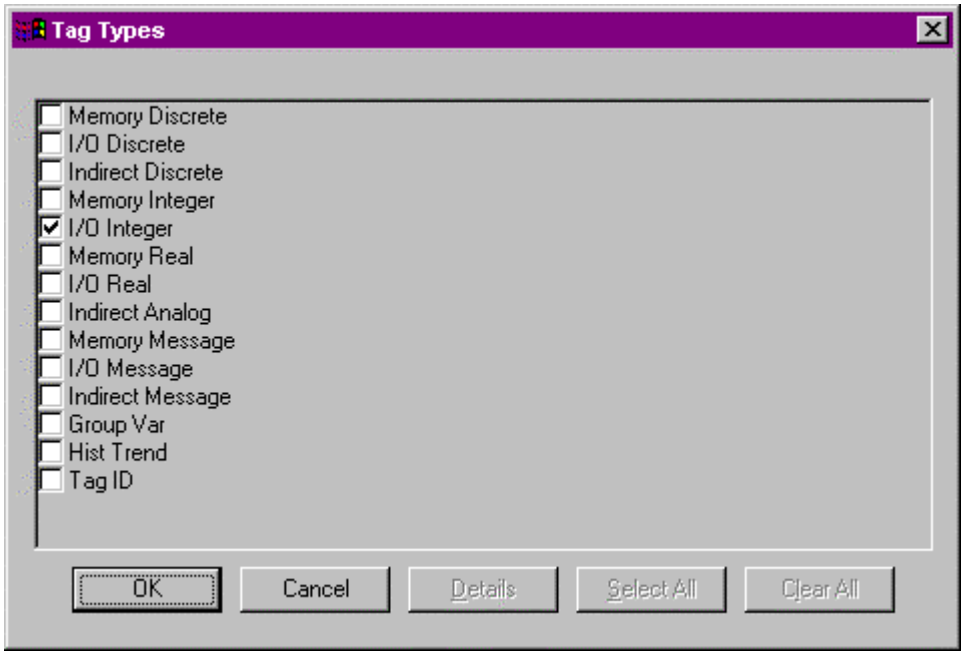
Defining the Tag Names

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



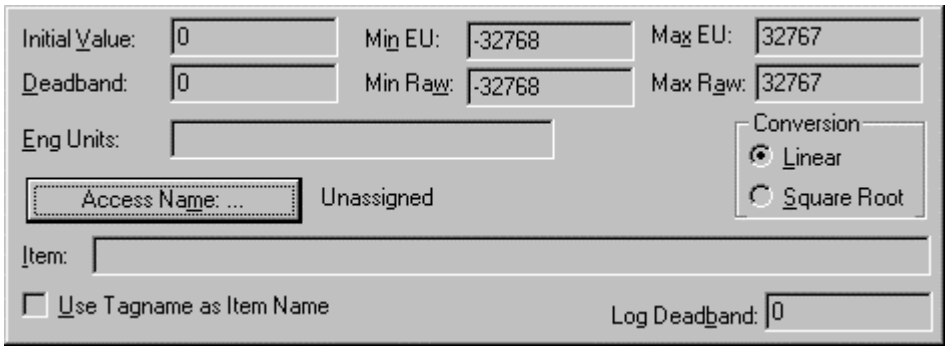
Click on **New** and enter the **Tagname**. (The tagname defined here is the name InTouch will use. The PROFACE GP Server does not see this name.)

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

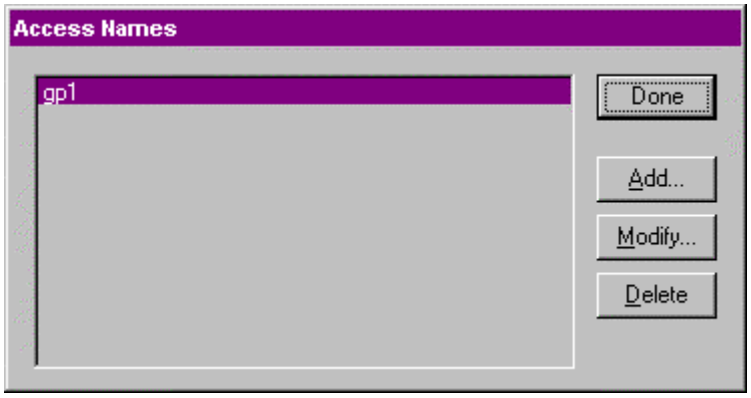


To access PROFACE GP device items, the type must be **I/O Discrete**, **I/O Integer** or **I/O Message**. Select the Tag type.

The "Details" dialogue box for the tagname will appear:

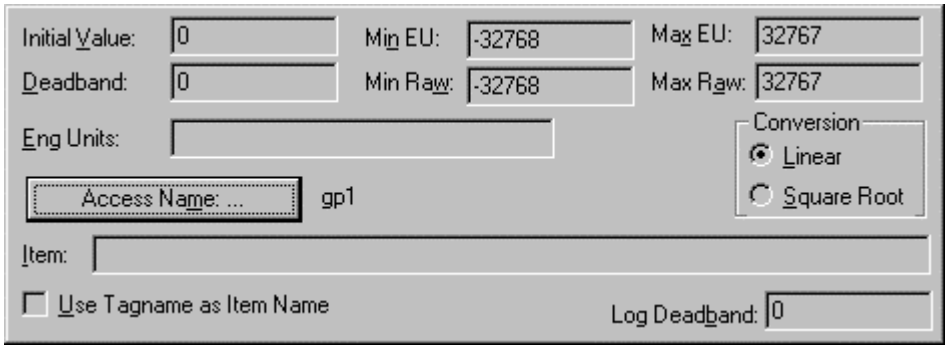


Select the Access name for PROFACE GP Server by clicking on the **Access Name: …** button. The "Access Names" dialogue box will appear:



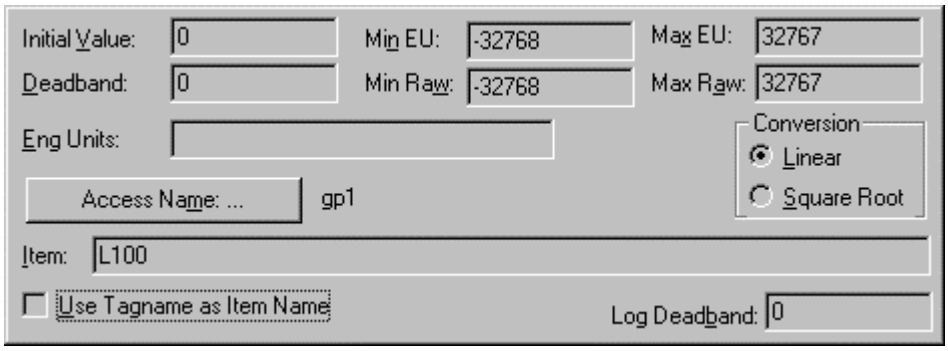
Select the appropriate Access Name and click on **Close**. (If the Access Name has not been defined as previously described, click on **Add…** and define the Access Name now.)

The "Details" dialogue box will appear displaying the selected Access Name:



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

Enter the PROFACE GP item name to be associated with this tagname in the Item: field in the "Details" box:



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

Where applicable, the **Use Tagname as Item Name** option may be selected to enter automatically 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 dialogue box) to accept the new tag name. 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 **GP1** is the Topic Name configured for PROFACE GP Server):

=view|DDEStatus!GP1

or

=view|IOStatus!GP1

Notes on Using Microsoft Excel

Data from PROFACE GP topics may be accessed from Excel spreadsheets. To do so, enter a formula like the following into a cell on the spreadsheet.

=PROFACEGP|topic!item

Sometimes, Excel requires the topic and/or item to be surrounded by apostrophes.

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 names described in the **Item Names** section.

Reading Values into Excel Spreadsheets

Values may be read directly into Excel spreadsheets by entering a DDE formatted formula into a cell, as shown in the following examples:

=PROFACEGP|'topic1'!'L100'
=PROFACEGP|'GP1'!'W100S'

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

Writing Values to PROFACE GP Points

Values may be written to the Server from Microsoft Excel by creating an Excel macro that uses the **POKE** command. The proper command is entered in Excel as follows:

channel=INITIATE("PROFACEGP","topicname")
=POKE(channel,"itemname", Data_Reference)
=TERMINATE (channel)
=RETURN()

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

channel=INITIATE("PROFACEGP ","topicname")
Opens a channel to a specific topic name (defined in the Server) in an application with name PROFACEGP (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 specific operand in the PROFACE GP 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 specified like 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.

=RETURN()
Marks the end of the macro.

The following is an example of Excel macro used to poke value from cell B2 to topic **GP1** item **L100**:

```
PokeMacro -Ctrl a
=INITIATE("PROFACEGP","GP1")
=POKE(A2,"L100",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.*

Using the PROFACE GP Server with OPC Clients

The “OPC & DDE” version of PROFACE GP Server is accessible from OPC Clients (e.g., Wonderware OPCLink I/O Server) and DDE clients (e.g., Excel).

There are following general steps needed to access an OPC item from PROFACE GP Server:

1. Run OPC Client application and select the “PROFACEGP OPC and DDE Server” from the list of available OPC Servers. If PROFACE GP 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 PROFACE GP 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 PROFACE GP Topic definition.
   c) By browsing the server address space.

By default the PROFACE GP Server is installed and used as a local OPC Server -- both OPC Server and OPC Client reside on same computer. The PROFACE GP 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 PROFACE GP Server as a remote OPC Server, it is necessary to install PROFACE GP 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	1) Permission not granted to OPC Client 2) Guest account disabled
Access is denied	1) DCOM security not configured properly 2) OPC Server application not located on local hard disk 3) 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 PROFACE GP “OPC & DDE” version as Windows NT Service

To **install** PROFACE GP Server “OPC & DDE” version to run as Windows NT Service, the PROFACE GP Server must be started with command line parameter "/Service":

PROFACEGP /Service

After this the “PROFACEGP 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 dialogue boxes. The **Allow Service to Interact with Desktop** checkbox in “Service” dialogue box must be checked (the “Service” dialogue box can be invoked by pressing the “Startup” button on “Services” dialogue box when Service **PROFACEGP OPC & DDE Server** is selected). If **Allow Service to Interact with Desktop** is not selected then PROFACE GP Server full functionality is not ensured (e.g. the Server configuration can not be changed, no message boxes will be displayed, etc.).

To use PROFACE GP 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 “PROFACEGP OPC & DDE Server” NT Service will be

accessed only from local OPC clients (i.e. PROFACE GP Server will not be used as a remote OPC Server), then **custom access** and **launch permissions** “NETWORK” are not needed.

To **uninstall** “PROFACEGP OPC & DDE Server” NT Service, at first the Service must be stopped by *Control Panel/Services/Stop* and then PROFACEGP Server must be started manually with command line parameter "/DelService":

PROFACEGP /DelService

After this the PROFACEGP Server “OPC & DDE” version will be still registered and accessible to OPC clients.

Using the PROFACE GP 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 PROFACE GP 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 PROFACE GP Server then there must be one or more topics defined for PROFACE GP Server. There are following important fields on the “OPCLink Topic Definition” dialogue box:

Topic Name
Enter a unique name (e.g. **GP1**) for the GP in this field. If using InTouch then same Topic Name is to be entered in the "Add Access Name" dialogue box when defining the Access Names for OPCLink Server in InTouch WindowMaker.

OPC Server Name
Select the name of the OPC server (**PROFACEGP.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. **GP1.**) 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 PROFACE GP Server can be obtained by clicking on **Browse** button (this allows to view the PROFACE GP 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 PROFACE GP Server.

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

Accessing PROFACE GP 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 PROFACE GP Server "OPC & DDE" version, the application portion of the address is **OPCLINK**.

topic name
Meaningful names are configured to identify specific devices. These names are then used as the topic name in all conversations to that device. This must be same name as **Topic Name** entered in the "OPCLink Topic Definition" dialogue box, for example, **GP1**.
Note. *You can define multiple topic names for the same GP 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
m – message (string)

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

IL100 – unsigned integer at address 100
DSTATUS – discrete, STATUS item of topic
MS2001 - message (string), concatenated 50 Flag words starting from Flag word 10

Troubleshooting

WIN.INI entries

The first time you run the PROFACE GP 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 system directory (e.g. C:\WINNT). It is an ASCII file and can be altered manually if you wish with any text editor, for example MS Notepad (*Do 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 PROFACE GP Server:

[PROFACEGP]
ProtocolTimer=10
ConfigurationFile=C:\PROFACEGP
WinIconic=0
WinFullScreen=0
WinTop=110
WinLeft=0
WinWidth=200
WinHeight=170
DumpScreen=1

The following additional entries can be used:

SlowPollRetries and **SlowPollInterval**
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 GP, 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).

Entering into slow poll mode is reported to WWLogger and (or) to PROFACE GP Internal Logger by following string:

"Entering slow poll mode on topic <TOPICNAME>, port <PORTNAME>."

Leaving the slow poll mode is reported to WWLogger and (or) to PROFACE GP Internal Logger by following string:

"Leaving slow poll mode on topic <TOPICNAME>, port <PORTNAME>."

The default values (they are used if WIN.INI file does not contain these entries) are **SlowPollRetries** equal to 5 and **SlowPollInterval** equal to 60 seconds.

MultiWrite

If **MultiWrite=1** entry is added to WIN.INI file [GP_DDE] section then write commands are processed in the following way: if server receives some new value to be written to GP and other writing command to same GP address is still pending (waiting for execution) then no new write command is created - the value in existing write command is replaced by new one. As default (no **MultiWrite** entry or **MultiWrite=0**) all write values are delivered to GP, i.e. always new write command is created. Note - the **MultiWrite=1** entry does not affect bit writings!

MessageRetries
The **MessageRetries=** entry can be used to specify how many times the GP_DDE server will try to send any command to GP. After **MessageRetries** expires the next command will be tried. As default (no **MessageRetries** entry or **MessageRetries=2**) the **MessageRetries** equal to 2 will be used. Note - the topic STATUS item value will change to 0 when **MessageRetries** expires.

WriteRetries
The **WriteRetries=** entry can be used only for write commands to specify how many times write command will be tried to send. The **WriteRetries** entry is used together with **MessageRetries** in the following way: if after **WriteRetries * MessageRetries** there is still no response from GP then this write command is removed from list of pending write commands and will be no more executed. As default (no **WriteRetries** entry or **WriteRetries=3** the **WriteRetries** equal to 3 will be used. So, if default settings (**MessageRetries=2** and **WriteRetries=3**) are used, the write command will be deleted after 6 unsuccessful retries.

Examples:
- by settings **MessageRetries=2** and **WriteRetries=1** the GP_DDE server will delete write command after 2 unsuccessful retries;
- by settings **MessageRetries=1** and **WriteRetries=1** the GP_DDE server will delete write command immediately after first unsuccessful retry.

Troubleshooting menu

The following debugging choices are appended to the Server's System Menu (the menu that appears when you click on the Server icon in the upper left hand corner of the Server's window):

Suspend Protocol/Resume Protocol - these choices permit you to turn protocol processing on and off, what means that you can suspend access to GPs.

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.

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

Show Rejected Writes - if checked then information about rejected write messages is logged.

Show Logger - if checked then PROFACE GP Internal Logger is activated and all debug information is going both to PROFACE GP Internal Logger. The PROFACE GP Internal Logger file is named as: **PROFACEGP_YYYYMMDD.LOGn**, where **YYYY** is a year, **MM** -- month, **DD** -- day and **n** -- order number of consecutive PROFACE GP Internal Logger file, starting from 1. The maximum size of PROFACE GP Internal Logger file is 16 MB; if there is more information logged then next consecutive file is created, e.g. there can be consecutive files PROFACEGP PROFACEGP_20000315.LOG1, PROFACEGP_20000315.LOG2, etc.

Dump - displays all information about opened ports, active topics and data items.

Dump Screen - if checked then information about active read messages are displayed on the Server main window. Can be used for monitoring purposes.

All debugs (except **DumpScreen**) are displayed by the Wonderware Logger or (and) PROFACE GP Internal Logger if **Show Logger** checked, which must be active for these commands to work.

***Note**. If you check **Show Send** and/or **Show Receive** then debug output grows very fast.*

KLINKMANN AUTOMATION
PROFACE GP Communication Server
Revision History

April 2000	Rev 1.0	Release 1.0
April 2001	Rev 1.1	OPC compliance information added.
Mar 2002	Rev 1.2	Installation from CD information added.