

S5PGPORT Communication Server

for Microsoft Windows
and Wonderware Applications

**User Manual
Ver 1.x Rev 1.12
DR 160 10
DR 160 11**

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S5PGPORT Communication Server

Overview

The **S5PGPORT Communication Server** (hereafter also referred to as the “S5PGPORT Server” or “S5PGPORT” or “Server”) is a Microsoft Windows 32-bit application program that acts as a communication protocol *Server* and allows other Windows application programs access to data from SIEMENS SIMATIC S5 Programmable Logic Controllers (S5-95U, S5-115U, S5-135U, S5-155U, Sinumerik 840C) using SIMATIC S5 Programming Port Interface (AS511). Any Microsoft Windows program that is capable of acting as a **DDE**, **FastDDE**, **SuiteLink** or **OPC Client** may use the S5PGPORT Server.

There are two different S5PGPORT Server versions described in this manual:

- Server version (ordering number DR 160 10), supporting SuiteLink, FastDDE and DDE protocols; this version hereafter is referred to as the “**Suite Link & DDE**” version.
- Server version (ordering number DR 160 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 **S5PGPORT.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 our industry, this extension is being pushed to its performance constraints in distributed environments. The S5PGPORT 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 standardized 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 S5PGPORT 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 S5PGPORT 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 S5PGPORT 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 S5PGPORT Server "OPC & DDE" version is implemented by **Wonderware I/O Server Toolkit** ver. 5.0 (008).

Accessing 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 SIMATIC S5 PLCs via this Server, the application portion of the address is **S5PGPORT**.

topic name

Meaningful names are configured in the Server to identify specific devices (PLCs). These names are then used as the topic name in all conversations to that PLC. The S5PGPORT Server considers each SIMATIC S5 PLC to be a separate topic. For example, **S95U**.

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. For the S5PGPORT Server, an item is an individual data bit, byte, word, timer, etc., in the PLC. The term "point" is used interchangeably with the term "item" in this User Manual. For more information on item/point names, see the "Item Names" section later in this manual.

Installing the S5PGPORT Server

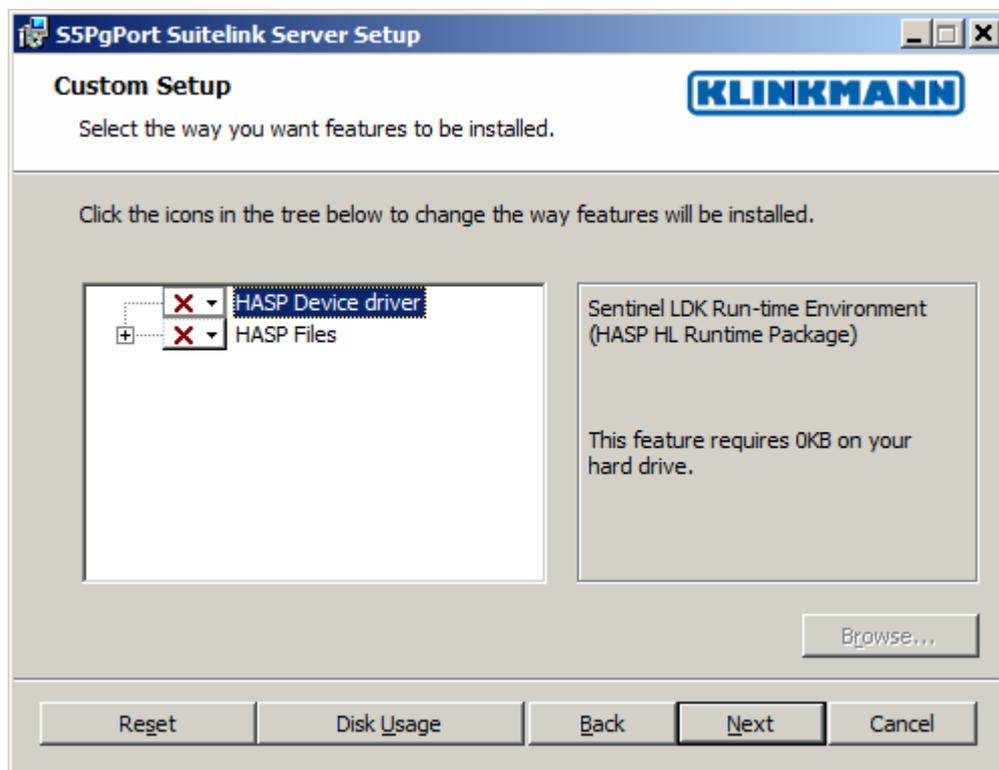
Installing the Server

The S5PGPORT Server installation package is supplied as a Microsoft Installer file DR16010_xxx.msi (for “Suite Link & DDE” version) or DR16011_xxx.msi (for “OPC & DDE” version), where xxx is the current (latest) version of S5PGPORT Server.

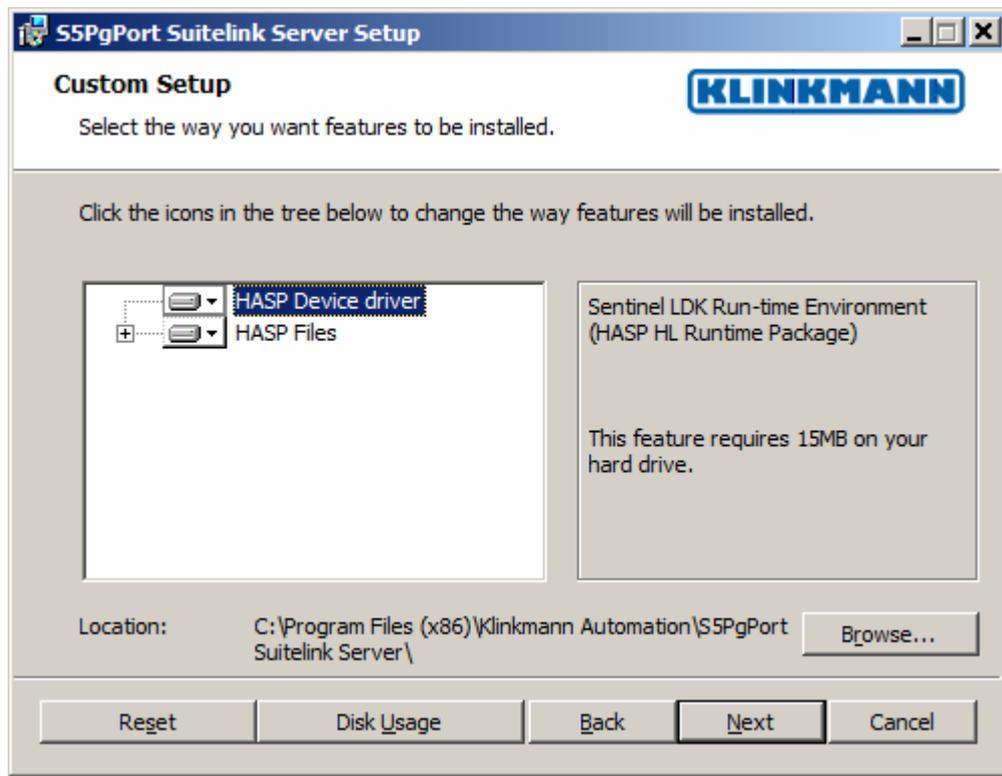
To install the S5PGPORT Server, run the DR16010_xxx.msi (for “Suite Link & DDE” version) or DR16011_xxx.msi (for “OPC & DDE” version) and proceed as directed by the S5PGPORT Server Setup Wizard. The installation is simple and straightforward, only it is important to select the correct protection (**HASP key** or **software license**) in “Custom Setup” dialog:

The HASP key or software license key is needed for full time running of S5PGPORT Server. The **HASP key** is an USB key (dongle) to be installed into PC USB port and needs the SafeNet Sentinel LDK Run-time Environment (HASP HL Runtime Package) to be installed and running – see details in “Licensing by using HASP HL key” section below. The **software license key** is a 16-character alphanumeric “computer-dependent” string, provided after purchasing the S5PGPORT Server (for more information, see “Software license key” section below. Without HASP key installed or software license key entered, the S5PGPORT Server will run one hour in demo mode. After purchasing the S5PGPORT Server, the appropriate HASP key or software license key is provided and no re-installation of S5PGPORT Server is needed.

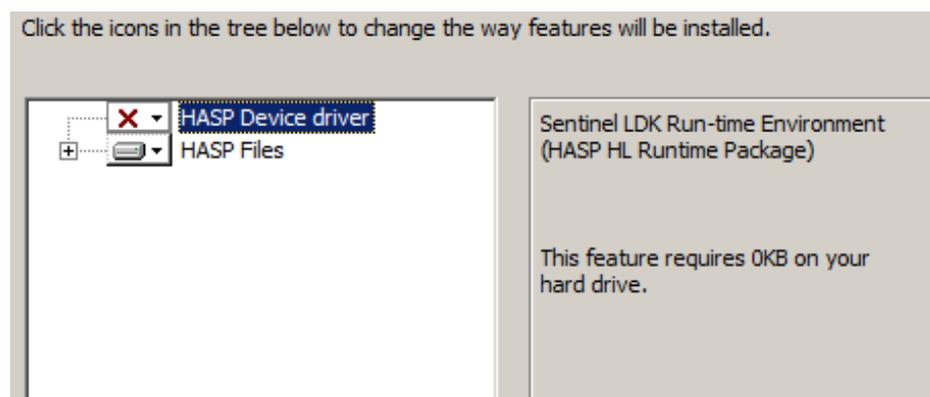
In case “HASP Device driver” and “HASP Files” **are not selected** then HASP USB key will not be supported and only the **software license** will be available (files needed for HASP USB key will not be installed):



In case “HASP Device driver” and “HASP Files” **are selected** then HASP USB key will be supported and both HASP-key and software license will be available (files needed for HASP USB key will be installed):



Note: In case the SafeNet Sentinel LDK Run-time Environment (HASP HL Runtime Package) is already installed on your computer (separately or by some other software) then it can be disabled:



When installation is finished, the subdirectory specified as a folder where to install the S5PGPORT Server files will contain the following files:

- S5PGPORT.EXE** The S5PGPORT Server Program. This is a Microsoft Windows 32-bit application program.
- S5PGPORT.CHM** The S5PGPORT Server Help file.
- S5PGPORT.CFG** An example configuration file.

hasp_windows_44.dll	Dynamic Link Library installed only if “HASP Files” is selected during the installation in “Custom Setup” dialog.
haspdinst.exe	Sentinel LDK Run-time Environment Installer (HASP HL Runtime Package), copied to S5PGPORT Server folder only if “HASP Device driver” is selected during the installation in “Custom Setup” dialog.
LICENSE.RTF	Klinkmann Automation software license file.

In case the “HASP Device driver” is selected during the installation in “Custom Setup” dialog, the Sentinel LDK Run-time Environment (HASP HL Runtime Package) is installed during the S5PGPORT Server installation (and will be uninstalled during the S5PGPORT Server uninstallation). The presence of Sentinel LDK Run-time Environment can be checked after the S5PGPORT Server installation by looking-up in Control Panel / Administrative Tools Services – the Service “Sentinel Local License Manager” must be started.

Notes:

1. The S5PGPORT Server “Suite Link & DDE” version is developed with Wonderware I/O Server Toolkit (ver 7,2,1,6) and needs the **Wonderware FS 2000 Common Components** to be installed on computer where the S5PGPORT Server is running. If using Wonderware InTouch 8.0 or newer, install the FS 2000 Common Components **before** installing InTouch (see also Wonderware Tech Notes 404 and 313). The Wonderware FS2000 Common Components are installed automatically when any of Wonderware product (e.g. InTouch or some Wonderware I/O server) is installed.
2. If S5PGPORT 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 S5PGPORT Server and these infrastructure files must be install prior to executing the S5PGPORT Server. **The I/O Server Infrastructure does not support** using S5PGPORT Server as a Windows Service and remote access to S5PGPORT Server (when DDE/SuiteLink Client is not located on same computer as S5PGPORT Server).

To **uninstall** the S5PGPORT Server, start Control Panel, select “Uninstall a program” (“Add/Remove Programs” on XP/2003) and select the “S5PGPORT Server” from the list of available software products. Click on “Uninstall” (“Add/Remove...” on XP/2003) and proceed as directed by the Uninstall Wizard.

Licensing by using HASP HL key

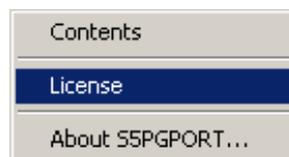
The following should be done to enable the licensing by HASP HL key:

- The “HASP Device driver” and “HASP Files” are selected during the S5PGPORT Server installation in “Custom Setup” dialog – that causes correspondingly haspdinst.exe and hasp_windows_4442.dll files are copied to S5PGPORT Server folder and Sentinel LDK Run-time Environment (HASP HL Runtime Package) is installed and started, enabling the S5PGPORT Server can detect the HASP HL USB dongle;
- insert the received HASP key into USB port, and **wait** until “Installing device driver software” message disappears and “Device driver software installed successfully” message appears;
- start S5PGPORT Server and check - if “Software key or HASP HL key not found!” message does not appear then it means everything is done correctly and S5PGPORT Server runs in full mode with licensing by HASP HL key enabled.

Software license key

GSM-Control supports the “computer dependent” **software licensing**. The following steps are required to enable it:

1) Start S5PGPORT Server, click on "Help" menu item (also short-cut Alt+H can be used) and pop-up menu with "Help" menu commands will appear:



Select “License” and “License” dialog will appear:



2) Here the “Customer PC Code” is “computer-dependent” string generated by S5PGPORT Server and it is unique for this computer. Write it down or Copy/Paste to e-mail when ordering the S5PGPORT Server.

3) After purchasing the S5PGPORT Server, you will get the software license key - 16-character alphanumeric string. Open the “License” dialog again and Copy/Paste it to “Software Key” field:



4) Click OK and restart S5PGPORT Server. S5PGPORT Server software license now is enabled.

Note – the “Software Key” string is saved to MS Windows system directory (e.g. C:\Windows) WIN.INI file [S5PGPORT Server] section to enable it is automatically detected at S5PGPORT Server next start-up.

Transferring the software license to other computer

The transfer of Software License Key might be needed in very rare situations when it is necessary to move Klinkmann software to other computer (or operation system change is planned for same computer). Such transfer PERMANENTLY removes the Software License Key, so be very careful when deciding to use this option.

The following steps are required to transfer the Software License Key:

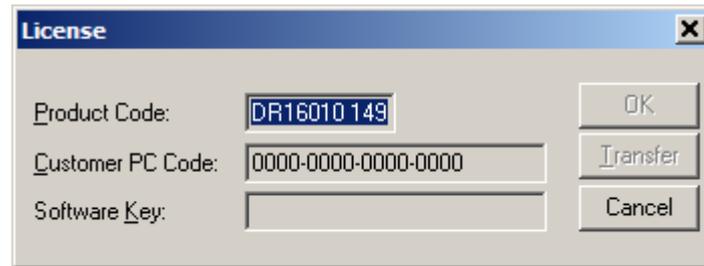
- 1) Start the S5PGPORT Server. For S5PGPORT Server “Suite Link & DDE” version, the ArchestrA SMC Log Viewer (or Wonderware Logger) must be started. For S5PGPORT Server “OPC & DDE” version, the S5PGPORT Internal Logger and “Log to File” should be enabled (see “Troubleshooting menu” and “Internal Logger” sections at the end of this manual). Select Help/License from main menu and click the “Transfer” button on “License” dialog:



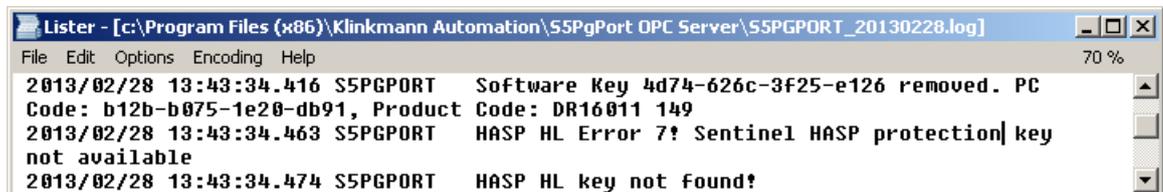
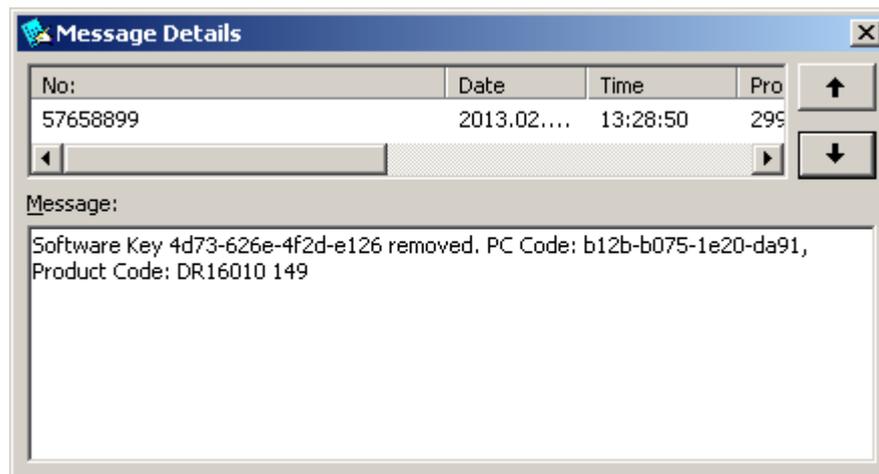
- 2) Confirm the transfer of Software License Key by clicking on Yes button:



The “License” dialog now will contain the empty “Customer PC Code” and “Software Key” fields:



- 3) Take the screenshot from Archestra SMC Logger or S5PGPORT Internal Log file window containing the “Software License Key removal message”, like below:



or take the string with “Software License Key removal message” directly from Archestra SMC Logger or S5PGPORT Internal Log file, like following:

Software Key 4d73-626e-4f2d-e126 removed. PC Code: b12b-b075-1e20-da91, Product Code: DR16010 149

- 4) Provide the obtained “Software License Key removal message” screenshot or string together with new “Customer PC Code” when applying for new Software License Key without purchasing the new license (in situations when it is necessary to move Klinkmann software to other computer or operation system change is planned).

Note!

Without providing the “Software License Key removal message” screenshot or string, the new Software License Key will not be assigned.

Installing the I/O Server Infrastructure

The I/O Server Infrastructure installation package is supplied as a self-extracting archive (IOServerInfrastructure.exe) and can be downloaded from Klinkmann's web site.

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.

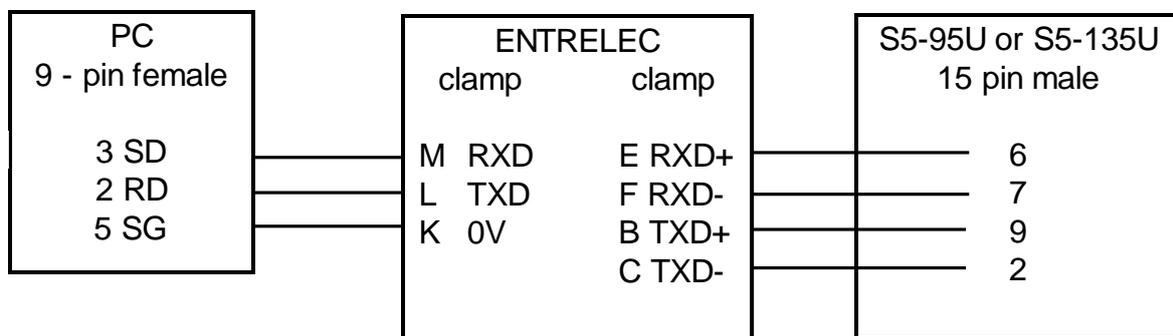
To **uninstall** the I/O Server Infrastructure, start Control Panel, select "Add/Remove Programs" and select the "IO Server Infrastructure" from the list of available software products. Click on "Add/Remove..." and proceed as directed by the UnInstallShield program.

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

Connection Cables

To connect Simatic S5 PLC to your computer, you can either use some manufactured cable, or you can make your own connections via a converter between the RS-232 serial port on the computer and the 20 mA current loop on the PLC. The programming ports on various Simatic S5 PLCs are not identical and therefore care must be taken to establish the proper communication.

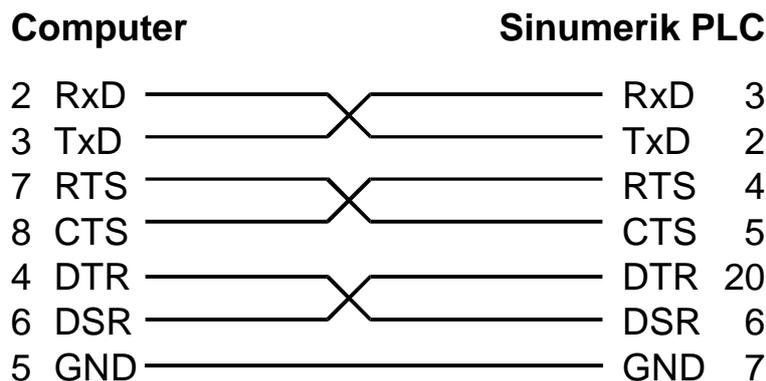
The S5PGPORT Server is tested with the ENTRELEC model ILPH RS232/CL (Current Loop) Serial Link Interface. The following wiring diagram (requires active PLC programming port) can be used to connect computer's RS-232 serial port and PLC (e.g. Simatic **S5-95U** or **S5-135U**) programming port:



DIP Switches:

1 = ON (TXD ACT), 2 = ON (RXD ACT), 3 = OFF (0-20 mA), 4 = ON (1=20mA).

The following wiring diagram can be used to connect computer's RS-232 serial port and **Sinumerik** PLC programming port:



Configuring the S5PGPORT Server

After the S5PGPORT Server is initially installed, a small amount of configuration is required. Configuring the Server automatically creates a **S5PGPORT.CFG** file that holds all of the topic definitions entered, as well as the communication port configurations. This file will automatically be placed in the same directory in which **S5PGPORT.EXE** is located unless the path where the configuration file will be placed is specified via the */Configure/Server Settings...* command.

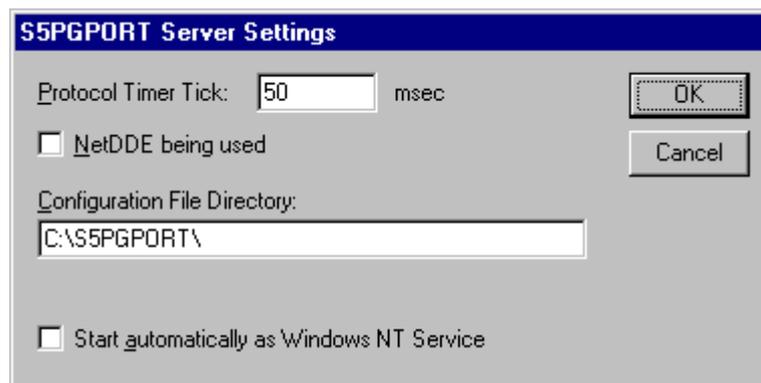
To perform the required configurations, start the S5PGPORT program. If the Server starts up as an icon, then double-click on the icon to open the server's window. To access the commands used for various configurations, open the */Configure* menu:



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 "S5PGPORT 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 PLC and receive one reply from PLC. 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 networking using NetDDE.

Configuration File Directory

This field is used to specify the path (disk drive and directory) in which S5PGPORT will save its current configuration file. The S5PGPORT Server 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 **S5PGPORT.CFG**.

Note: There is no limit to the number of configuration files created, although each must be in a separate directory. When using the S5PGPORT Server with **InTouch**, it is good practice to place the configuration file in the application directory.

Start automatically as Windows NT Service

Enabling this option will cause the S5PGPORT 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.

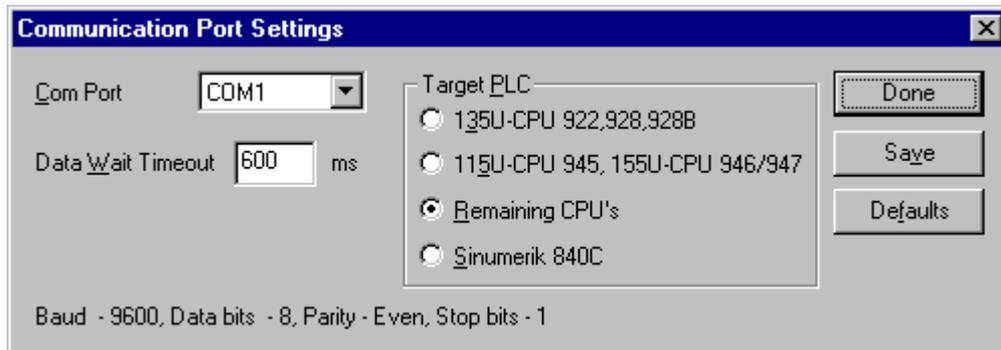
Notes:

1. The **Start automatically as Windows NT Service** feature can be activated only with S5PGPORT Server "Suite Link & DDE" version. To start the S5PGPORT Server "OPC & DDE" version as Windows NT Service, refer to **Running S5PGPORT "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 must be checked (the "Service" dialog box can be invoked by pressing the "Startup" button on "Services" dialog box when Service **S5PGPORT_IOServer** is selected). If **Allow Service to Interact with Desktop** is not selected then S5PGPORT Server full functionality is not ensured (e.g. the Server configuration can not be changed, no message boxes will be displayed, etc.).

Once 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 Simatic S5 PLC. Invoke the `/Configure/Com Port Settings...` command. The "Communication Port Settings" dialog box will appear.



The following describes each field in this dialog box:

Select the **Com Port** and examine the characteristics of the selected Port. To select a necessary Com Port, click on the combo box button and make your choice from the list box.

Reply Timeout

This field is used to enter the amount of time (in seconds) the Simatic S5 PLC using the selected communication port will be given to reply to commands from the Server. Also the horizontal scroll bar below this field can be used to change the entered value.

Note: *The default value of 3 seconds should be sufficient for most configurations.*

Target PLC

The S5PGPORT Server can handle the complete list of SIEMENS Simatic S5 PLCs. To communicate with certain CPUs, the S5PGPORT Server has to know the type of CPU. The following selections are available:

- Simatic S5 135U with CPU 922, 928, 928B;
- Simatic S5 115U with CPU 945 or Simatic S5 155U with CPU 946 or CPU 947;
- Sinumerik PLC with CPU 840C;
- All remaining Simatic S5 PLCs with CPUs not listed above this is default setting.

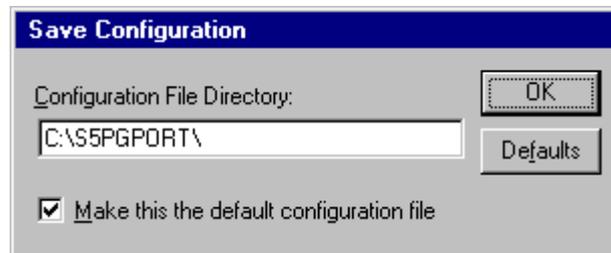
Note: *For Sinumeric PLC's it is possible to access only to Data Blocks and Extended Data Blocks.*

The following other communication parameters are used: *Baud Rate - 9600, 8 Data Bits, 1 Stop Bit, Even Parity.* These parameters can not be changed.

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

Saving S5PGPORT 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 S5PGPORT Server to find the configuration file automatically each time it is started.

Configuration File Location

When the S5PGPORT 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 **File/Run** command in **File Manager** or **Program Manager** and enter the following:

S5PGPORT /d:c:\directoryname

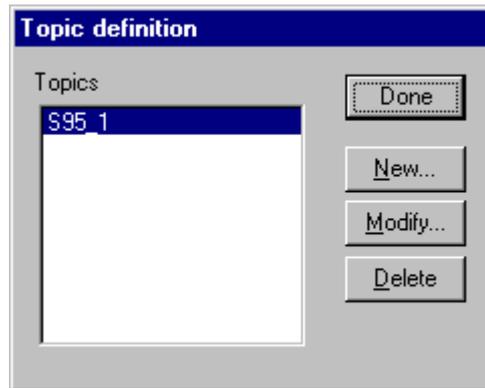
Note: *There is no limit to the number of configuration files that may be created, although each must be in a separate directory.*

Topic Definition Command

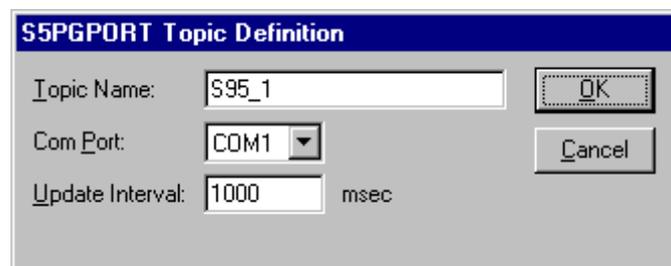
The user provides each connected Simatic S5 PLC with an arbitrary name that is used as the Topic Name for all references to this PLC.

The following steps are taken to define the Topic attached to the PLC:

1. Invoke the Configure/Topic Definition... 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 "S5PGPORT Topic Definition" dialog box will appear:



3. 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 S5PGPORT Server with InTouch* section.

4. Click on the **Com Port** button to associate a topic with the communication port.
Note: Additional topics may be associated with the same communication port later.
5. Set the **Update Interval** field to indicate the frequency the items/points on this topic will be read (polled). Default value is 1000 milliseconds.
6. When all entries have been made, click on **OK** to process the configuration for this topic.

Running the S5PGPORT Server

Startup sequence

The S5PGPORT Server uses AS511 programming port protocol to communicate with Simatic S5 PLCs. All PLC data areas are accessed by absolute addresses. The Server reads start addresses of Flags, Inputs, Outputs, Counters, Timers, Data Blocks and Extended Data Blocks. For Data Blocks and Extended Data Blocks the Server also reads the block size. These values are used to validate the item names and to create read and write commands to be sent to PLC.

These absolute addresses are determined when Server opens the serial port, i.e. when first topic associated with this serial port is activated. So if PLC is connected and ON then there are no problems - the startup sequence is read from PLC, obtained information is used to validate item names and to create read and write commands and normal communication process starts. The situation is different if at serial port opening time the PLC is not connected or switched OFF. In this case the Server cannot execute this startup sequence.

If correct startup sequence can not be executed then topic is not rejected, but only topic STATUS is marked as bad. All valid item names also are accepted. There is following setting available in the WIN.INI file [S5PGPORT] section, used to specify the "slow poll mode" (in seconds) at which the startup sequence is repeated, for example the following setting:

StartupSequenceInterval=600

specifies that Server executes startup sequence each 10 minutes. The default value of StartupSequenceInterval is 300 (5 minutes). After startup sequence is executed, all items in corresponding topics are verified and information about invalid items is logged to WWLogger and (or) to S5PGPORT Internal Logger.

Controlling the computer resources

For the S5PGPORT Server, the separate thread is used for each communication port, so there is no need to check how the Server uses computer resources.

Item Names

The S5PGPORT Server uses an item/point naming convention, based on the two-letter data type identifiers, used to program Siemens PLCs. The following data areas are supported:

- **Data Blocks,**
- **Extended Data Blocks,**
- **Flags,**
- **Inputs,**
- **Outputs,**
- **Counters,**
- **Timers,**
- **Absolute Address.**

All PLC data areas are accessed by absolute addresses. These addresses are determined when Server opens the communication on PC serial port. The Server reads start addresses of Flags, Inputs, Outputs, Counters, Timers, Data Blocks and Extended Data Blocks. For Data Blocks and Extended Data Blocks the Server also reads the block size. These values are used to validate the item names. All other data areas are accessible as absolute addresses, which can be found in the PLC manual.

Note: *If the PLC program changes at runtime the location and length of Data Blocks (physical addresses of data) then the Server cannot determine this situation and continues to work with old values.*

Note: *In the current Server version, for **Sinumeric** 840C PLCs the writing/reading is supported only to/from **Data Blocks** and **Extended Data Blocks**. If for example, writing/reading is required to flag area, then corresponding fragment must be included in the PLC program, which will transfer values from data block to flag area or vice versa.*

The general syntax of item name is:

Prefix{Type modifier}{_}address{_}{suffix}

where

- | | |
|----------------------|--|
| Prefix | - determines data area type and data block number for Data Blocks and Extended Data Blocks; |
| Type modifier | - determines data size in bytes and location; |
| _ | - used to separate address from suffix and prefix or type modifier; useful for absolute address to prevent the interpretation of hexadecimal digits as prefix or vice versa; |
| address | - determines item number or address; |
| suffix | - determines type of item and data conversion. |

There are following **Prefixes**, **Type Modifiers** and **Address Ranges** available:

Data area	Prefix	Type Modifiers	Address Range
Data blocks	DBbD	<u>W</u> , L, R, D, S	0 to length of block
Ext. data blocks	DXbD	<u>W</u> , L, R, D, S	0 to length of block
Flags	F	<u>B</u> , W, D, S	0 to 255
Inputs	I	<u>B</u> , W, D, S	0 to 127
Outputs	Q	<u>B</u> , W, D, S	0 to 127
Counters	C	<u>None</u> W	0 to 255
Timers	T	<u>None</u> W	0 to 255
Absolute address	AS	B, <u>W</u> , D, S * L, R, <u>W</u> , D, S	0 to FFFF ** 0 to FFFFF * 0 to FFFF

Where **b** - Data Block or Extended Data Block number.

Notes: 1. Underlined **Type modifiers** are default.

2. * for PLC S5-135U.

3. ** for PLC S5-115U and S5-155U.

There are following **Suffixes** available:

Type Modifier	Description	Suffix	Tag Type	Range
W	Word	<i>None</i> , .n (n = 0 to 15), BCD, KF, KC, BC, BT, KT	Integer Discrete Integer Integer Integer Message	0 to 65535 0 or 1 0 to 9999 -32768 to 32767 0 to 999 0.0 to 999.3
B L R	Byte Left Byte Right Byte	<i>None</i> , .n (n = 0 to 7), BCD, KF	Integer Discrete Integer Integer	0 to 255 0 or 1 0 to 99 -128 to 127
D	Double word	<i>None</i> , .n (n = 0 to 31), BCD KG	Integer Discrete Integer Real	-2147483648 to 2147483647 0 or 1 0 to 99999999 Floating point
S	String	.sn (sn = 2 to 32)	Message	Even length from 2 to 32

Where:

n - the bit position in item;

sn - the length of string in bytes; **sn** must be even number from 2 to 32.

Suffix **BC** is used if it is necessary to view a counter value directly. There is no sense to use this suffix for other data areas except counters. Suffix **KC** is used to view counter values transferred to other data areas (e.g. Data Blocks) by means of “LD” and “T” STEP 5 operations. There is no sense to use suffix **KC** together with counter prefix **C**. The counters without suffix and type modifiers are assumed as with suffix **BC** and **W** type modifier.

Suffix **BT** is used if it is necessary to view a timer value directly. There is no sense to use this suffix for other data areas except timers. Suffix **KT** is used to view timer values transferred to other data areas (e.g. Data Blocks) by means of “LD” and “T” STEP 5 operations. There is no sense to use suffix **KT** together with timer prefix **T**. The timers without suffix and type modifiers are assumed as with suffix **BT** and **W** type modifier.

Item Naming Examples

This section provides some examples of item names where the correct format is used.

DB10D20.15

data block 10
bit 15 of data word 20

DB10DL20

data block 10
left byte of data word 20
value in the PLC is binary and has a range of 0 to 255

DB10DW20KF

data block 10
data word 20
value in the PLC is binary and has a range of -32768 to 32767

DB10DW20BCD

data block 10
data word 20
value in the PLC is in BCD format and has a range of 0 to 9999

DB10DS20.8

data block 10
value in the PLC is character string containing 8 bytes and starting at data word 20

DB10DW20KC

data block 10
data word 20
value in the PLC is in counter constant format and has a range of 0 to 999

DB10DW20KT

data block 10
data word 20
value in the PLC is in timer constant format and has a range of 0.0 to 999.3

FB100

flag byte 100
value in the PLC is binary and has a range of 0 to 255

FW100BCD

flag word starting at flag byte 100
value in the PLC is in BCD format and has a range of 0 to 9999

I32.0

bit 0 of input byte 32

TW0BT

timer word 0
value in the PLC is in binary timer format

CW10BC

counter word 10
value in the PLC is in binary counter format

ASS5F00.10

value in the PLC is character string containing 10 bytes and starting at absolute address 5F00 (Hex)

ASB_5F_BCD

value in the PLC is byte (BCD format) and starting at absolute address 5F (Hex)

DB1DD13KG

data block 1
data double word 13
value in the PLC is in floating point format

Monitoring and Controlling Communication with a PLC

For each topic, there are following additional items offered by S5PGPORT 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:

=S5PGPORT|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 Only (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 (these items are active but their quality is set to NO_ACCESS). 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 S5PGPORT Server with OPC Clients

The “**OPC & DDE**” version of S5PGPORT Server is accessible from OPC Clients.

There are following general steps needed to access an OPC item from S5PGPORT Server:

1. Run OPC Client application and select the “S5PGPORT OPC and DDE Server” from the list of available OPC Servers. If S5PGPORT 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 S5PGPORT 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 S5PGPORT Topic definition.
 - c) By browsing the server address space.

By default the S5PGPORT Server is installed and used as a local OPC Server - both OPC Server and OPC Client reside on same computer. The S5PGPORT 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 S5PGPORT Server as a remote OPC Server, it is necessary to install S5PGPORT 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 – <i>JohnB</i>	OPC Client Computer name – <i>SteveL</i>
Install the OPC Server.	✓	✓
Run Dcomcnfg.exe	✓	✓
Invoke Default Properties and set Default Authentication Level to (<i>None</i>), Default Impersonation Level to <i>Impersonate</i> .	✓	✓
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 <i>JohnB</i> .		✓
Edit Security settings: 1) set the following custom access permissions : NETWORK, SYSTEM, <i>SteveL</i> ; 2) set the following custom launch permissions : INTERACTIVE, SYSTEM, NETWORK, <i>SteveL</i> ; 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1) Permission not granted to OPC Client 2) Guest account disabled
Access is denied	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 S5PGPORT “OPC & DDE” version as Windows NT Service

To install S5PGPORT Server “OPC & DDE” version to run as **Windows NT Service**, the S5PGPORT Server must be started with command line parameter `"/Service"`:

S5PGPORT /Service

After this the “S5PGPORT 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 **S5PGPORT OPC & DDE Server** is selected). If **Allow Service to Interact with Desktop** is not selected then S5PGPORT Server full functionality is not ensured (e.g. the Server configuration can not be changed, no message boxes will be displayed, etc.).

To use S5PGPORT 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 "S5PGPORT OPC & DDE Server" NT Service will be accessed only from local OPC clients (i.e. S5PGPORT Server will not be used as a remote OPC Server), then **custom access** and **launch permissions** "NETWORK" are not needed.

To uninstall "S5PGPORT OPC & DDE Server" NT Service, at first the Service must be stopped by *Control Panel/Services/Stop* and then S5PGPORT Server must be started manually with command line parameter `"/DelService"`:

S5PGPORT /DelService

After this the S5PGPORT Server "OPC & DDE" version will be still registered and accessible to OPC clients.

Using S5PGPORT 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 S5PGPORT 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 S5PGPORT Server then there must exist one or more topics defined for S5PGPORT Server. There are following important fields on the "OPCLink Topic Definition" dialog box:

Topic Name

Enter a unique name (e.g. **PLC1**) 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 (**S5PGPORT.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. **S95_1.**) 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 S5PGPORT Server can be obtained by clicking on "Browse" button (this allows to view the S5PGPORT 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 S5PGPORT Server.

Browse

Clicking on this button initiates the browsing through exposed address space of S5PGPORT Server. All currently available item/point names (including data area names and range of addresses) and names of pre-defined (additional) items will appear on "Browse OPC items:" window in alphabetical order.

*Note! For Data Blocks and Extended Data Blocks the available address space will be exposed only after the **Startup sequence** (see **Running the S5PGPORT Server** section) successful execution.*

Accessing S5PGPORT 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 S5PGPORT 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, **PLC1**.

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 S5PGPORT Server. Some examples of possible item names acceptable by OPCLink Server/S5PGPORT Server connection:

dDB10D20.15

discrete
data block 10
bit 15 of data word 20

iFB100

integer
flag byte 100
value in the PLC is binary and has a range of 0 to 255

mDB10DS20.8

message
data block 10
value in the PLC is character string containing 8 bytes and starting at data word 20

Using the S5PGPORT Server with Suite Link and DDE Clients

The “**Suite Link & DDE**” version of S5PGPORT Server is accessible from Suite Link clients (e.g. InTouch) and DDE clients (e.g. Excel). The “**OPC & DDE**” version of S5PGPORT Server is accessible from DDE clients.

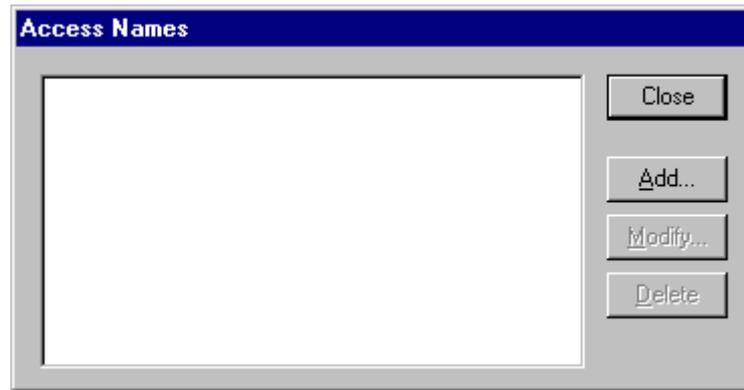
Using the S5PGPORT Server with InTouch

To access to items/points on the Simatic S5 PLCs from **InTouch**, the Access Names and Tag names should be defined in **WindowMaker**.

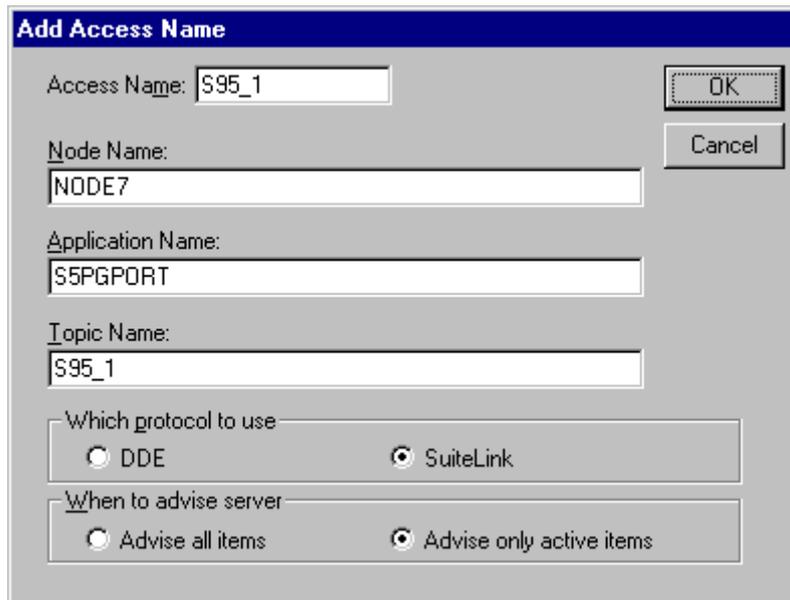
Defining the Access Names

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" dialog box will appear.



Click on **Add...**. The "Add Access Name" Dialog Box will appear:



Note: If **Add** is selected, this dialog 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

In the Access Name box type the name you want InTouch to use 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 S5PGPORT Server the S5PGPORT is used. Do not enter the .exe extension portion of the program name.

Topic Name

Enter the name defined for the topic in the S5PGPORT Server to identify the topic the S5PGPORT Server will be accessing.

The Topic Name is an application-specific sub-group of data elements. In the case of data coming from a S5PGPORT Server program, the topic name is the exact same name configured for the topic in the S5PGPORT 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 S5PGPORT 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.

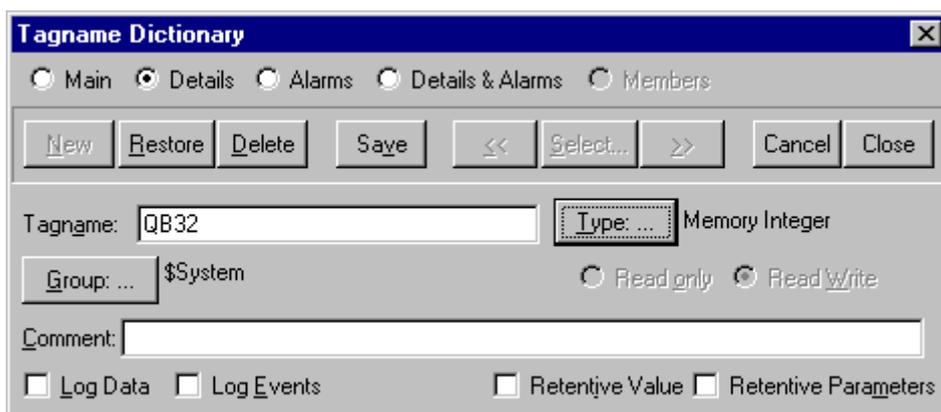
Select **Advise only active items** if you want the Server program to poll only points in visible windows and points that are alarmed, logged, trended or used in any script.

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.

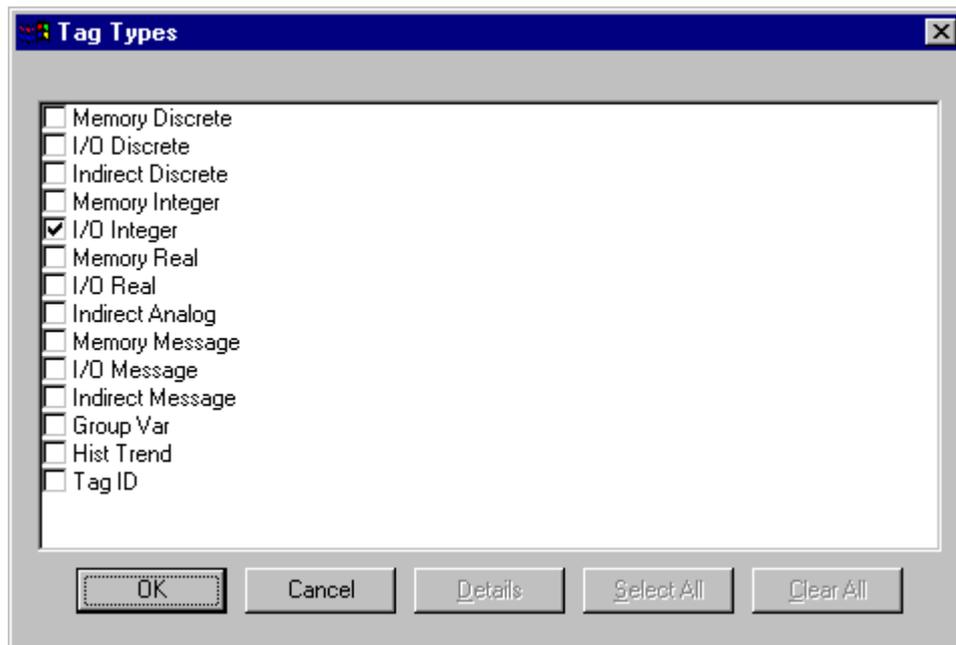
Defining the Tag names

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



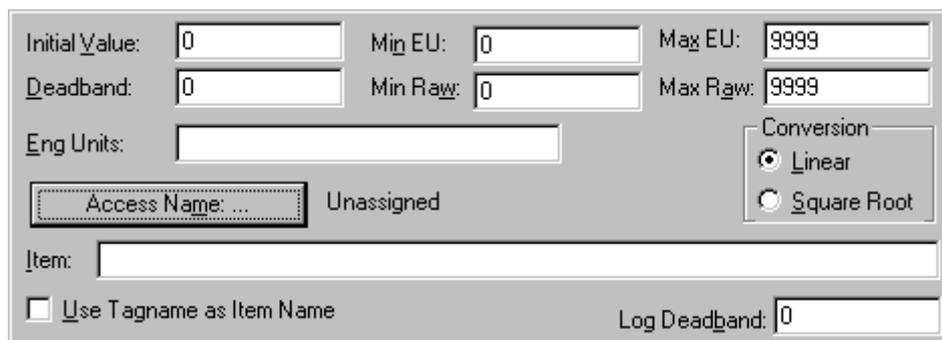
Click on **New** and enter the **Tagname**. (The tag name defined here is the name **InTouch** will use. The S5PGPORT Server does not see this name.)

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

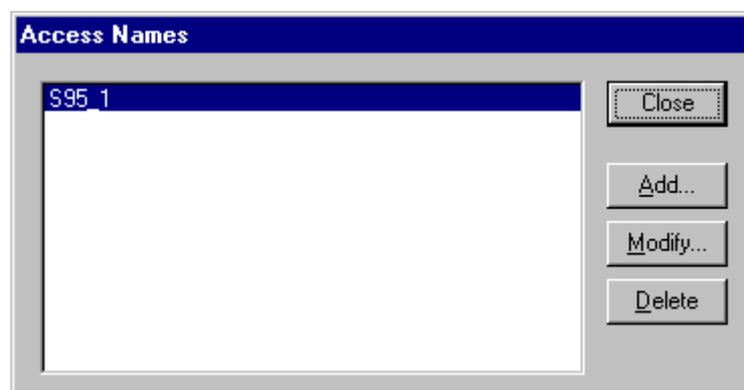


To access S5PGPORT items, the type must be **I/O Discrete**, **I/O Integer** or **I/O Message**. Select the Tag type.

The "Details" dialog box for the tag name will appear:



Select the Access Name for S5PGPORT Server 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 described, click on **Add** and define the Access Name now.) The "Details" dialog box will appear displaying the selected Access Name:

Initial Value:	<input type="text" value="0"/>	Min EU:	<input type="text" value="0"/>	Max EU:	<input type="text" value="9999"/>
Deadband:	<input type="text" value="0"/>	Min Raw:	<input type="text" value="0"/>	Max Raw:	<input type="text" value="9999"/>
Eng Units:	<input type="text"/>				Conversion
<input type="text" value="Access Name: ..."/>	<input type="text" value="S95_1"/>				<input checked="" type="radio"/> Linear
					<input type="radio"/> Square Root
Item:	<input type="text"/>				
<input type="checkbox"/> Use Tagname as Item Name					Log Deadband: <input type="text" value="0"/>

For integer data 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 **Min Raw** and **Max EU** equal to **Max Raw**.

Enter the S5PGPORT item name to be associated with this tagname in the **Item:** field in the "Details" box:

Initial Value:	<input type="text" value="0"/>	Min EU:	<input type="text" value="0"/>	Max EU:	<input type="text" value="9999"/>
Deadband:	<input type="text" value="0"/>	Min Raw:	<input type="text" value="0"/>	Max Raw:	<input type="text" value="9999"/>
Eng Units:	<input type="text"/>				Conversion
<input type="text" value="Access Name: ..."/>	<input type="text" value="S95_1"/>				<input checked="" type="radio"/> Linear
					<input type="radio"/> Square Root
Item:	<input type="text" value="QB32"/>				
<input type="checkbox"/> Use Tagname as Item Name					Log Deadband: <input type="text" value="0"/>

(Refer to the **Item Names** section below 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**, which are used to monitor the status of communication 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 **S95_1** is the Topic Name configured for S5PGPORT Server):

```
=view|DDEStatus!S95_1
```

or

```
=view|IOStatus!S95_1
```

Notes on Using Microsoft Excel

Data from S5PGPORT topics (PLCs) may be accessed from Excel spreadsheets. To do so, enter a formula like the following into a cell on the spreadsheet.

```
=S5PGPORT|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 can be read directly into Excel spreadsheets by entering a DDE formatted formula into a cell, as shown in the following examples:

```
=S5PGPORT|S95_1!QB0  
=S5PGPORT| S135_3!IW10  
=S5PGPORT| S95_2!DB0DW1
```

The **status** item can be read by entering the following formula in a cell:

```
=S5PGPORT|topic!STATUS
```

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

Writing Values to S5PGPORT 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("S5PGPORT","topicname")
=POKE(channel,"itemname", Data_Reference)
=TERMINATE (channel)
=RETURN()
```

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

channel=INITIATE("S5PGPORT","topicname")

Opens a channel to a specific topic name (defined in the Server) in an application with name S5PGPORT (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 Simatic S5 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 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 **PLC1** item **DB20DW30**:

```
PokeMacro –Ctrl a
=INITIATE("S5PGPORT","PLC1")
=POKE(A2,"DB20DW30",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 S5PGPORT Server configuration, most of the items in the following list will automatically appear in the WIN.INI file, located 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, e.g. MS Windows 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 S5PGPORT Server:

```
[S5PGPORT]
WinIconic=0
WinFullScreen =0
WinTop=126
WinLeft=548
WinWidth=414
WinHeight=144
```

There are following additional WIN.INI entries available for S5PGPORT Server:

StartupSequenceInterval

The **StartupSequenceInterval** entry is used to enter the number of seconds between executions of *startup sequence* (see **Running the S5PGPORT** section).

SlowPollRetries and SlowPollInterval

The **SlowPollRetries** entry is used to enter the number of consecutive error retries for one topic (PLC). 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 5 and **SlowPollInterval** equal to 60 seconds.

For example, the following entries can be used to specify that slow poll mode 2 minutes will start after 3 consecutive unsuccessful retries:

```
SlowPollRetries =3
SlowPollInterval=120
```

Entering into slow poll mode is reported to WWLogger and (or) to S5PGPORT Internal Logger by following string:

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

If all topics for some port are in slow poll mode then after 5 full slow poll cycles (all topics are at least 5 times polled) this port is closed and reopened again.

Leaving the slow poll mode is reported to WWLogger and (or) to S5PGPORT Internal Logger by following string:

"Leaving slow poll mode on topic <TOPICNAME> on port <PORTNAME> after %d seconds."

WriteRetryIndefinitely

The **WriteRetryIndefinitely** entry is used to disable the deleting of pending write messages when *slow poll mode* is started. As default (no WriteRetryIndefinitely entry in WN.INI or WriteRetryIndefinitely=0) all write messages for this topic are deleted when topic enters the slow poll mode. To disable this the following entry can be used:

WriteRetryIndefinitely=1

Note! Be careful when using this setting if PLC is switched off but client application continues to generate new values to be written to this PLC - it can cause the computer memory overflow with memory allocated for write messages.

ShowAllRejectedWrites

The **ShowAllRejectedWrites** 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 **ShowAllRejectedWrites=1** then information about each rejected write value is reported to WWLogger and (or) to S5PGPORT Internal Logger. If **ShowAllRejectedWrites=0** (default) then Server rejects each write to suspended topic(s) without logging any information.

Troubleshooting menu

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

Suspend Protocol / Resume Protocol - these choices permit you to turn protocol processing on and off, what allows you to suspend access to PLC(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.

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

ShowRejectedWrites - if checked then information about rejected write messages is logged.

Show Logger - if checked then S5PGPORT Internal Logger is activated and all debug information is going to S5PGPORT Internal Logger. The S5PGPORT Internal Logger file is named in the format:

S5PGPORT_YYYYMMDD.LOGn

where **YYYY** is a year, **MM** is a month, **DD** is a day and **n** is a order number of consecutive S5PGPORT Internal Logger file, starting from 1 (the S5PGPORT Internal Logger file maximum size is 16 MB; if there is more information logged then next consecutive file is

created, e.g. there can be consecutive files
S5PGPORT_19990413.LOG1, S5PGPORT_19990413.LOG2, etc.).

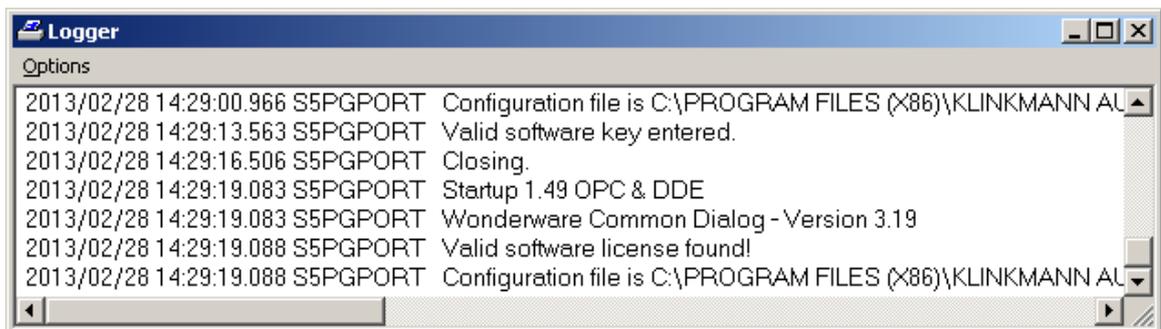
Dump - displays all information about opened ports, active topics and data items.

All debug information is displayed via the Wonderware Logger or (and) to S5PGPORT Internal Logger if **Show Logger** is checked, which must be active for these commands to work.

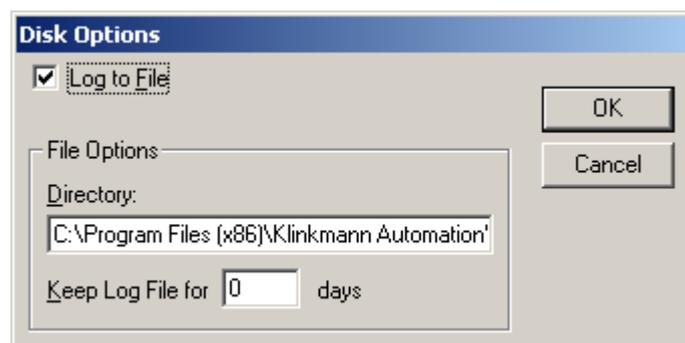
Warning: if you check **Show Send** and/or **Show Receive** then debug output grows very fast.

Internal Logger

To enable the S5PGPORT Internal Logger, check the **Show Logger** option at the S5PGPORT Server System Menu (see *Troubleshooting menu* section above) - this command can be used to start/stop the Internal Logger. The Internal Logger window looks like following:



To save Internal Logger information to file, select *Options/Disk Options...* from Internal Logger main menu – the “Disk Options” dialog box will appear:



The following can be entered in this dialog box:

Log to File

If checked then Internal Logger information will be saved to Internal Logger file. The S5PGPORT Internal Logger file name is created in the following format:

S5PGPORT _YYYYMMDD.LOGn

where **YYYY** is a year, **MM** is a month, **DD** is a day and **n** is a order number of

consecutive S5PGPORT Internal Logger file, starting from 1. The S5PGPORT Internal Logger file maximum size is 16 MB; if there is more information logged then next consecutive file is created, e.g. there can be consecutive files S5PGPORT_20030228.LOG1, S5PGPORT_20030228.LOG2, etc.

Directory

Enter the path where to keep the Internal Logger File.

Keep Log File for

Here the number of days how long to keep the Internal Logger File can be entered. After this number of days expires, the corresponding Internal Logger File will be automatically deleted. The default value **0** keeps Internal Logger Files forever - in this case they can be deleted manually.

KLINKMANN AUTOMATION
S5PGPORT Communication Server
Revision History

Oct 95	Rev 1.0	First Release
Nov 95	Rev 1.1	Minor modifications in the manual
Aug 97	Rev 1.2	Minor changes. Manual file name changed.
Dec 97	Rev 1.3	Minor changes. Bitmaps modified.
Mar 98	Rev 1.4	Sinumerik PLC support added.
Sep 98	Rev 1.5	Startup sequence processing added. 32-bit version supports separate thread for each communication port.
Dec 98	Rev 1.6	Suite Link support added. Installing the Server section changed. New items for monitoring and controlling communication with a PLC added. User manual layout changed. Modifications in the manual text.
May 99	Rev 1.7	OPC support added.
Jan 2001	Rev 1.8	OPC compliance information added.
Mar 2002	Rev 1.9	Installation from CD information added.
May 2002	Rev 1.10	Suffix KG supported for all PLC types.
Oct 2002	Rev 1.11	“Installing the S5PGPORT Server” section modified, “Licensing by using HASP HL key” and “Software license key” sub-sections added, “Internal Logger” section added.