MODBUS GPRS UDP
Communication Server

for Microsoft Windows
and InTouch Applications

User Manual
Ver 1.x Rev 1.1
DR 381 10
DR 381 11

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MODBUS GPRS UDP Communication Server

Overview

The **MODBUS GPRS UDP Communication Server** (hereafter referred to as the "MODBUS GPRS UDP Server" or "MODBUS Server" or "MODBUS" 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 MODBUS network using the **UDP/IP** interface (in UDP Server mode only), with special functionality implemented to support the **GPRS** wireless communications. The Server acts as a MODBUS master device. Any Microsoft Windows program that is capable of acting as a **DDE**, **FastDDE**, **SuiteLink** or **OPC** *Client* may use the MODBUS GPRS UDP Server.

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

- Server version (ordering number DR 381 10), supporting SuiteLink, FastDDE and DDE protocols; this version hereafter is referred to as the "***Suite Link & DDE***" version.
- Server version (ordering number DR 381 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 **MODBUSUDP.EXE**. All further information in this manual is same for all versions of the Server, with the exception of few points where communication protocol specific features are explained.

Communication Protocols

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

FastDDE provides a means of packing many proprietary Wonderware DDE messages into a single Microsoft DDE message. This packing improves efficiency and performance by reducing the total number of DDE transactions required between a client and a server. Although Wonderware's FastDDE has extended the usefulness of DDE for the industry, this extension is being pushed to its performance constraints in distributed environments. The MODBUS GPRS UDP 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 2.05a dated June 2002 (3.00 dated March 2003).

The OPC support for MODBUS GPRS UDP 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 MODBUS GPRS UDP 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 MODBUS GPRS UDP Communication Server is implemented by ***Wonderware I/O Server Toolkit*** ver. 7,2,1,6.

The FastDDE (Version 2) and DDE support for MODBUS 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 a MODBUS node via this Server, the application portion of the address is **MODBUSUDP**.

topic name
Meaningful name of communication entity, that is referred also as “Logical device”. Commonly the name considers entire MODBUS node but in more intricate applications separate data and control item groups on the same node can be accessed by different topics. For example, **Node5** is an ordinary topic name for the fifth node on the MODBUS bus.
Note! You can define multiple topic names for the same device (node) to poll different items at different rates.

item name
A specific data element within the specified topic. For example, when using this Server, items can be individual operands (registers, binary inputs, binary outputs) in the MODBUS node. The term "point" is used interchangeably with the term "item" in this User Manual. For more information on item names, see the ***Item Names*** section later in this manual.

Installing the MODBUS GPRS UDP Server

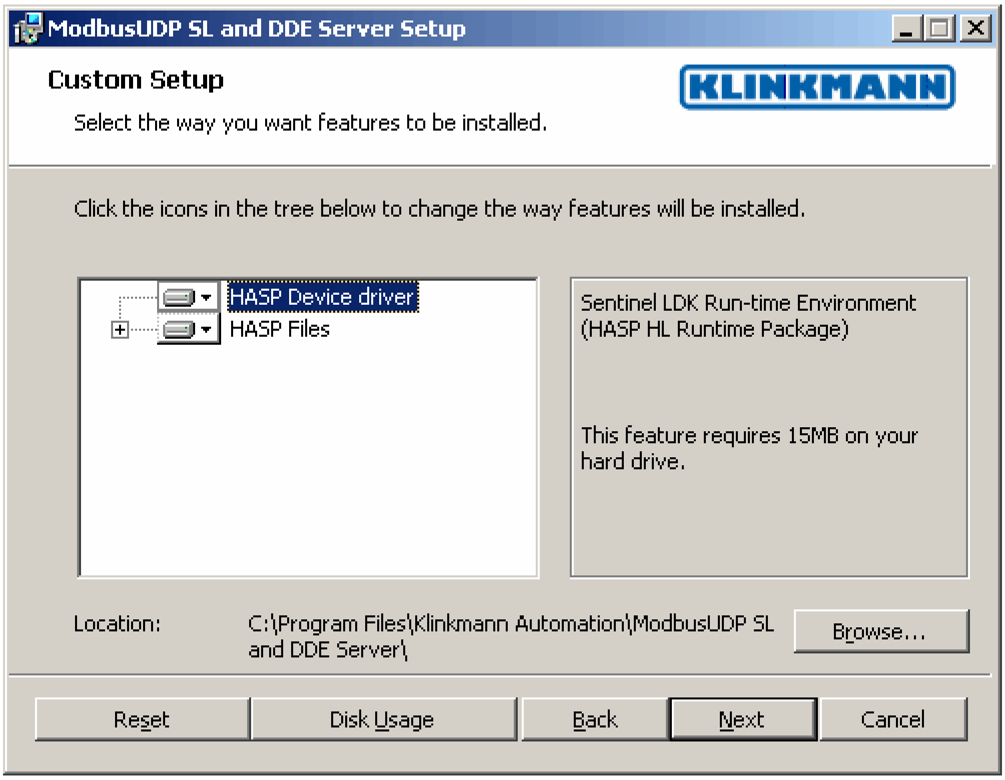
Installing the Server

The MODBUS GPRS UDP Server installation package is supplied as a self-extracting archive 38110xxx.msi (“Suite Link & DDE” version) or 38111xxx.msi (“OPC & DDE” version), where xxx is the current (latest) version of the Server.

To **install** the MODBUS GPRS UDP Server, run the 38110xxx.msi or 38111xxx.msi and proceed as directed by the MODBUS GPRS UDP 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 the MODBUS GPRS UDP 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 MODBUS GPRS UDP Server (for more information, see “Software license key” section below. Without HASP key installed or software license key entered, the MODBUS GPRS UDP Server will run one hour in demo mode. After purchasing the MODBUS GPRS UDP Server, the appropriate HASP key or software license key is provided and no re-installation of the MODBUS GPRS UDP Server is needed.

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):



Custom Setup

Select the way you want features to be installed.

Click the icons in the tree below to change the way features will be installed.

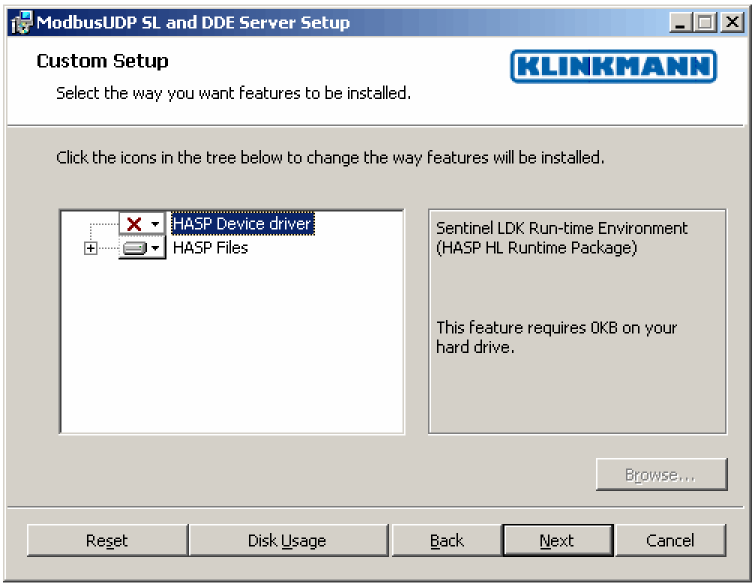
HASP Device driver
HASP Files

Sentinel LDK Run-time Environment (HASP HL Runtime Package)

This feature requires 15MB on your hard drive.

Location: C:\Program Files\Klinkmann Automation\ModbusUDP SL and DDE Server\

***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:*


ModbusUDP SL and DDE Server Setup

Custom Setup

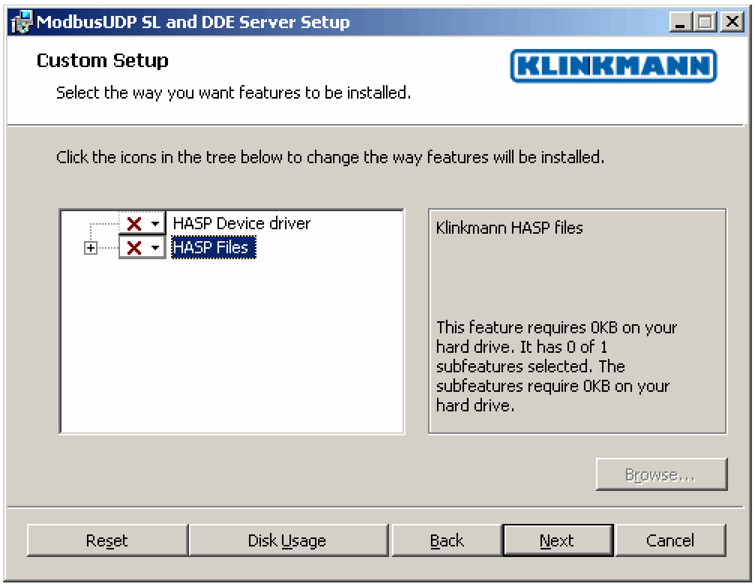
Select the way you want features to be installed.

Click the icons in the tree below to change the way features will be installed.

Sentinel LDK Run-time Environment (HASP HL Runtime Package)

This feature requires 0KB on your hard drive.

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):


ModbusUDP SL and DDE Server Setup

Custom Setup

Select the way you want features to be installed.

Click the icons in the tree below to change the way features will be installed.

Klinkmann HASP files

This feature requires 0KB on your hard drive. It has 0 of 1 subfeatures selected. The subfeatures require 0KB on your hard drive.

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

MODBUSUDP.EXE The MODBUS GPRS UDP Server Program. This is a Microsoft Windows 32-bit application program.

MODBUSUDP.CHM The MODBUS Server help file.

MODBUSUDP.CFG An example configuration 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.
TCPWORK.DLL	Dynamic Link Library necessary for Ethernet communication.
hasp_windows_4442.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 the 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 MODBUS GPRS UDP Server installation (and will be uninstalled during the MODBUS GPRS UDP Server uninstallation). The presence of Sentinel LDK Run-time Environment can be checked after the MODBUS GPRS UDP Server installation by looking-up in Control Panel / Administrative Tools Services – the Service “Sentinel Local License Manager” must be started.

Notes:

1. *The MODBUS GPRS UDP Server 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 MODBUS GPRS UDP 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).*

2. *If MODBUS GPRS UDP 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 MODBUS GPRS UDP Server “Suite Link & DDE” version and these infrastructure files must be installed prior to executing the Server. The **I/O Server Infrastructure** <u>does not support</u> using MODBUS GPRS UDP Server as a Windows Service and remote access to MODBUS GPRS UDP Server (when DDE/SuiteLink Client is not located on same computer as MODBUS GPRS UDP Server).*

Uninstalling the Server

To uninstall the MODBUS GPRS UDP Server, start Control Panel, select “Uninstall a program” (“Add/Remove Programs” on XP/2003) and select the “ModbusUDP SL and DDE Server” or “ModbusUDP OPC and DDE 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

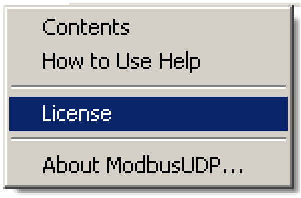
The following should be done to enable the licensing by HASP HL key:

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

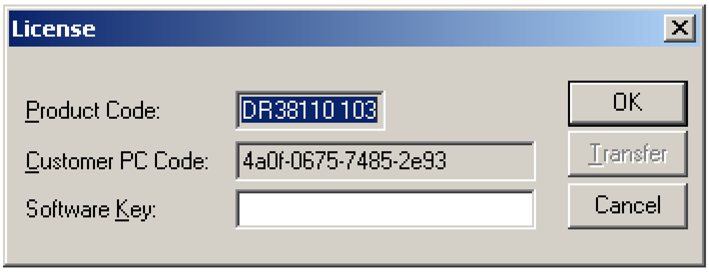
Software license key

MODBUS GPRS UDP Server supports the "computer dependent" software licensing. The following steps are required to enable it:

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



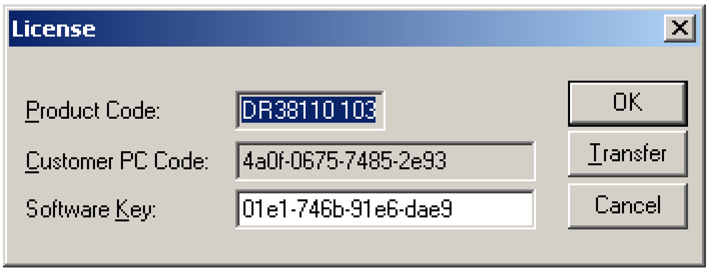
Select "License…" and "License" dialog will appear:



Product Code: DR38110 103
Customer PC Code: 4a0f-0675-7485-2e93
Software Key:

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

3) After purchasing the MODBUS GPRS UDP 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:



License

Product Code: DR38110 103

Customer PC Code: 4a0f-0675-7485-2e93

Software Key: 01e1-746b-91e6-dae9

4) Click OK and restart MODBUS GPRS UDP Server. The MODBUS GPRS UDP Server software license now is enabled.

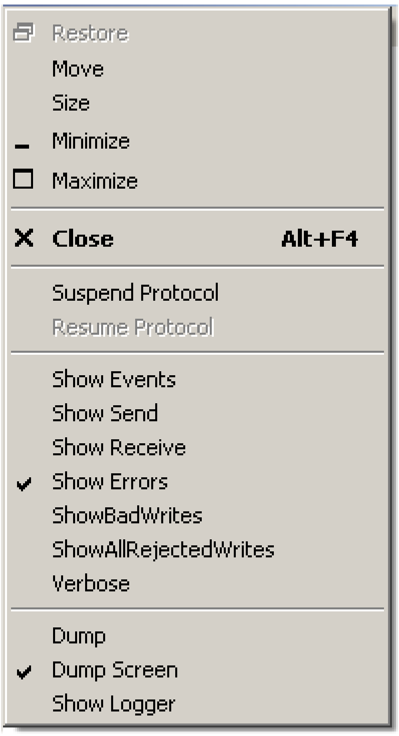
Note – the “Software Key” string is saved to MS Windows WIN.INI file to enable it is automatically detected at MODBUS GPRS UDP Server next start-up.

Transferring the software license to other computer

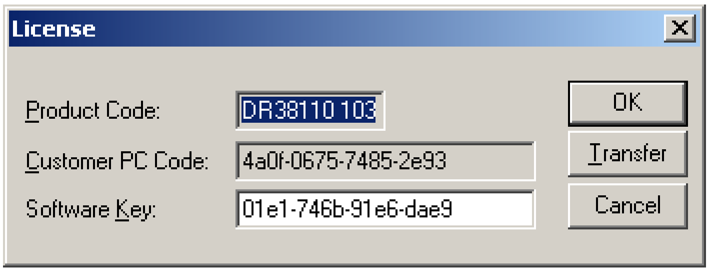
The transfer of Software License Key might be needed in very rare situations when it is necessary to move Klinkmann software to other computer (or operation system change is planned for same computer). Such transfer PERMANENTLY removes the Software License Key, so be very careful when deciding to use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

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

1) Start the MODBUS GPRS UDP Server and enable (if not yet enabled) the “Log to File” (for OPC&DDE version) or “Log to WWLogger” option on MODBUS GPRS UDP Server system menu (the menu that appears when you click on the Server icon in the upper left hand corner of the Server's window):



2) Select Help/License from main menu and click the “Transfer” button on “License”



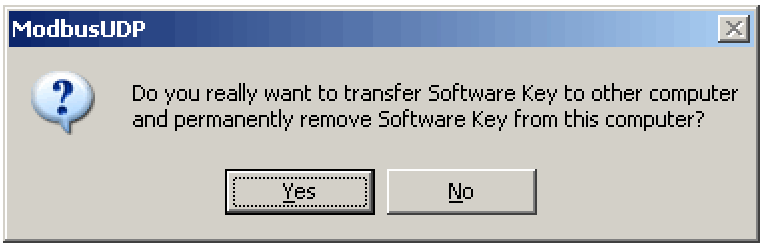
License

Product Code: DR38110 103

Customer PC Code: 4a0f-0675-7485-2e93

Software Key: 01e1-746b-91e6-dae9

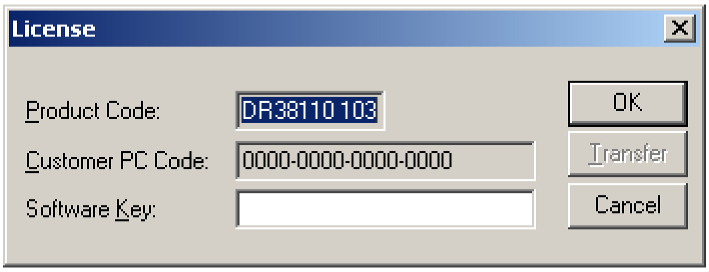
3) Confirm the transfer of Software License Key by clicking on Yes button:



ModbusUDP

Do you really want to transfer Software Key to other computer and permanently remove Software Key from this computer?

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



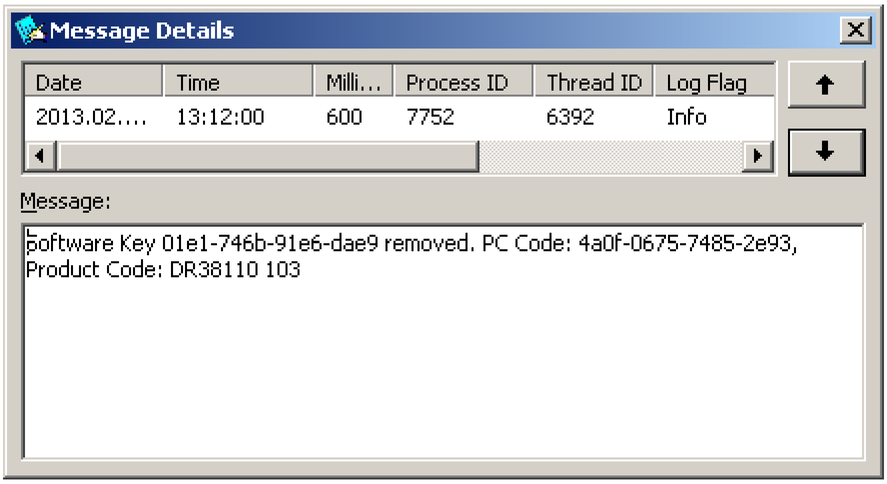
License

Product Code: DR38110 103

Customer PC Code: 0000-0000-0000-0000

Software Key:

4) Take the screenshot from the MODBUS GPRS UDP internal log file or Wonderware Logger window containing the “Software License Key removal message”, like below:



Message Details

Date	Time	Milli...	Process ID	Thread ID	Log Flag
2013.02....	13:12:00	600	7752	6392	Info

Message:

```
Software Key 01e1-746b-91e6-dae9 removed. PC Code: 4a0f-0675-7485-2e93,
Product Code: DR38110 103
```

or take the string with “Software License Key removal message” directly from MODBUS GPRS UDP internal log file or from Wonderware Logger, like following:

2013/02/12 13:12:00.584 ModbusUDP Software Key 01e1-746b-91e6-dae9 removed. PC Code: 4a0f-0675-7485-2e93, Product Code: DR38110 103

5) 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.

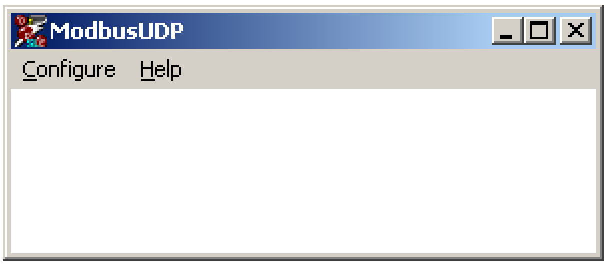
To **uninstall** the I/O Server Infrastructure, start Control Panel, select “Add/Remove Programs” and select the “IO Server Infrastructure” from the list of available software products. Click on “Add/Remove…” and proceed as directed by the UnInstallShield program.

Note: *The I/O Server Infrastructure installation will be rejected if Wonderware FS2000 Common Components are already installed on same computer. The I/O Server Infrastructure does not support using MODBUS GPRS UDP Server as a Windows Service and remote access to MODBUS GPRS UDP Server (when DDE/SuiteLink Client is not located on same computer as MODBUS GPRS UDP Server).*

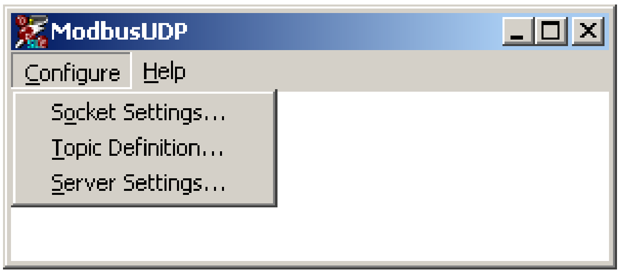
Configuring the Modbus GPRS UDP Server

After the Modbus GPRS UDP Server is initially installed, a little of configuration is required. Configuring the Server automatically creates **MODBUS.CFG** file that holds all of the topics (nodes) definitions entered, as well as the communication port configurations. This file will be placed automatically in the same directory in which the Server 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 up the MODBUS program. If the Server starts up as an icon, double-click on the icon to open the server's window. The following will appear:



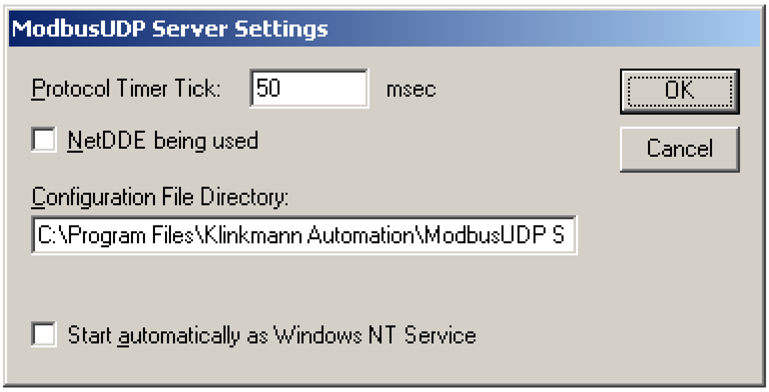
To access the commands used for the various configurations, open the */Configure* menu:



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 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 "Modbus Server Settings" dialog box will appear:



Protocol Timer Tick: 50 msec

□ NetDDE being used

Configuration File Directory:
C:\Program Files\Klinkmann Automation\ModbusUDP S

□ Start automatically as Windows NT Service

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 request command to the bus and receive one reply from the bus (when Server acts as **master** device) or to look for a request from the bus and send the reply to the bus (when Server acts as **slave** device). If the Server acts as a MODBUS master, two activations of the Server are needed to process one full data exchange cycle. At first tick the request with task code is sent to the bus and on the second tick the response with data or the acknowledgement is received from the bus. If the Server acts as a MODBUS slave, the response or acknowledgement is sent in the same tick in which the request is received. If some step of send/receive cycle is taking too long time then more than one activation of the Server is needed 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. With minimum value the maximum performance of Server is ensured, but in this case also the overload of computer is possible. In case of computer's overload the* ***Protocol Timer Tick*** *value can be increased to some higher value to achieve Server performance and computer load optimum correlation.*

NetDDE being used
Select this option if you are networking using NetDDE.

Configuration File Directory
The first field is used to specify the path (disk drive and directory) in which MODBUS GPRS UDP Server will save its current configuration file. The 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* ***MODBUS.CFG.***
Note: *There is no limit to the number of configuration files created, although each must be in a separate directory. When using the MODBUS GPRS UDP 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 MODBUS GPRS UDP Server to start as a Windows Service.

MS Windows 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 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 application program once again.

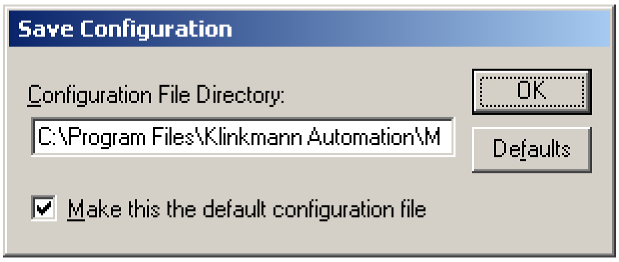
Notes:
1. The ***Start automatically as Windows NT Service*** *feature can be activated only with MODBUS Server "Suite Link & DDE" version. To start the MODBUS Server "OPC & DDE" version as Windows Service, refer to* ***Running MODBUS "OPC & DDE" version as Windows Service*** *section of this manual.*
2. The Service Startup configuration can be changed by MS Windows ***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 ***MODBUSUDP_IOServer*** *is selected). If* ***Allow Service to Interact with Desktop*** *is not selected then MODBUS 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**.

Saving of the ModbusUDP Server 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:



Configuration File Directory: C:\Program Files\Klinkmann Automation\M

☑ Make this the default configuration file

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 will allow the MODBUS GPRS UDP Server to find the configuration file automatically each time it is started.

Configuration File Location

When the MODBUS GPRS UDP 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 and enter the following:

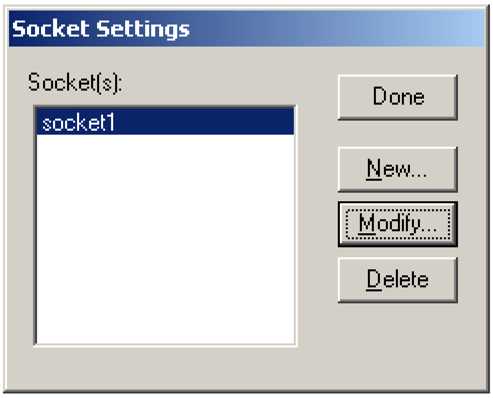
MODBUSUDP/d:c:\directoryname

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

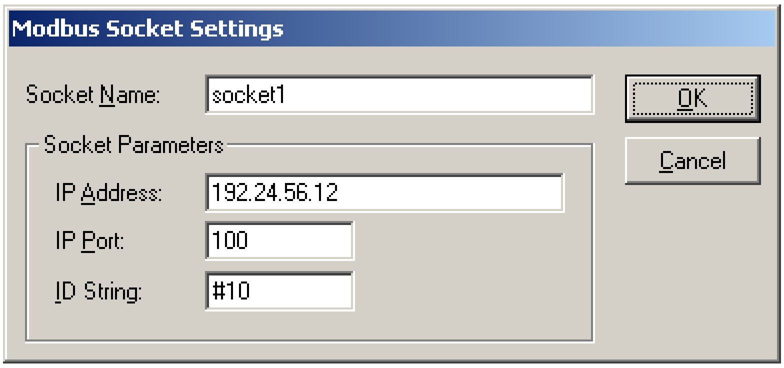
Socket Settings Command

To configure the Socket used to access data from MODBUS bus over GPRS (Ethernet UDP/IP) interface, the following steps are taken:

1. Invoke the */Configure/Socket Settings...* command. The "Socket Settings" first dialog box will appear:



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



Socket Name: socket1

IP Address: 192.24.56.12

IP Port: 100

ID String: #10

Enter the **Socket Name**.

Enter the **IP Address** and local **IP Port** number of your computer where ModbusUDP is running in UDP Server mode.

ID String
This field is used to enter the contents of string, which must be sent as a first data from remote device (PLC) to ModbusUDP Server and is used by Modbus Server to identify which of remote devices (PLCs) is connecting (considering that IP Address and IP Port of remote device (PLC) can be unknown – for example, if connecting via public GPRS network). This string can contain up to 11 ASCII characters. Recommended practice would be to include the remote device (PLC) Station Number here, for example, if PLC Station Number is 1 then in ID String value can be **#1**.

Each time when DDE/SuiteLink/OPC client application activates communication with some ModbusUDP Server topic, the ModbusUDP Server creates a Socket and waits for UDP connection from remote device (PLC). After “ID String” is received from remote device (PLC), ModbusUDP Server accepts the connection and communication between ModbusUDP Server and remote device (PLC) can start.

***Note:** The “ID String” can be used only with devices/connections supporting possibilities to send non-Modbus data – with programmable GPRS-modems (e.g. Cinterion TC65T or Telit GT863-PY) is connected to remote device (PLC) and Klinkmann embedded application is running on the modem.*

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

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

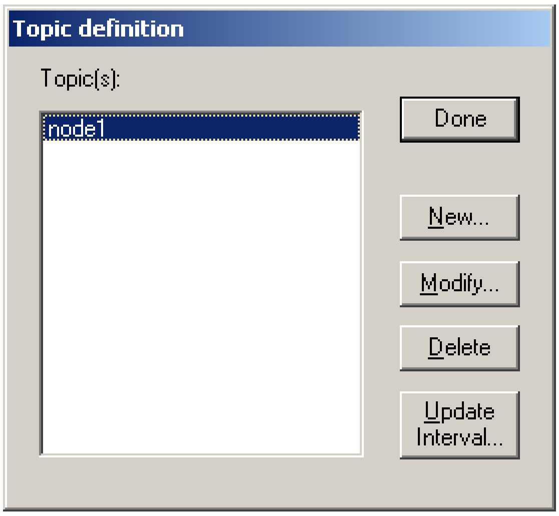
Note: *If this is the first time either Communication Port or Socket have been configured, the user will be prompted to save configuration to an existing directory.*

Topic Definition Command

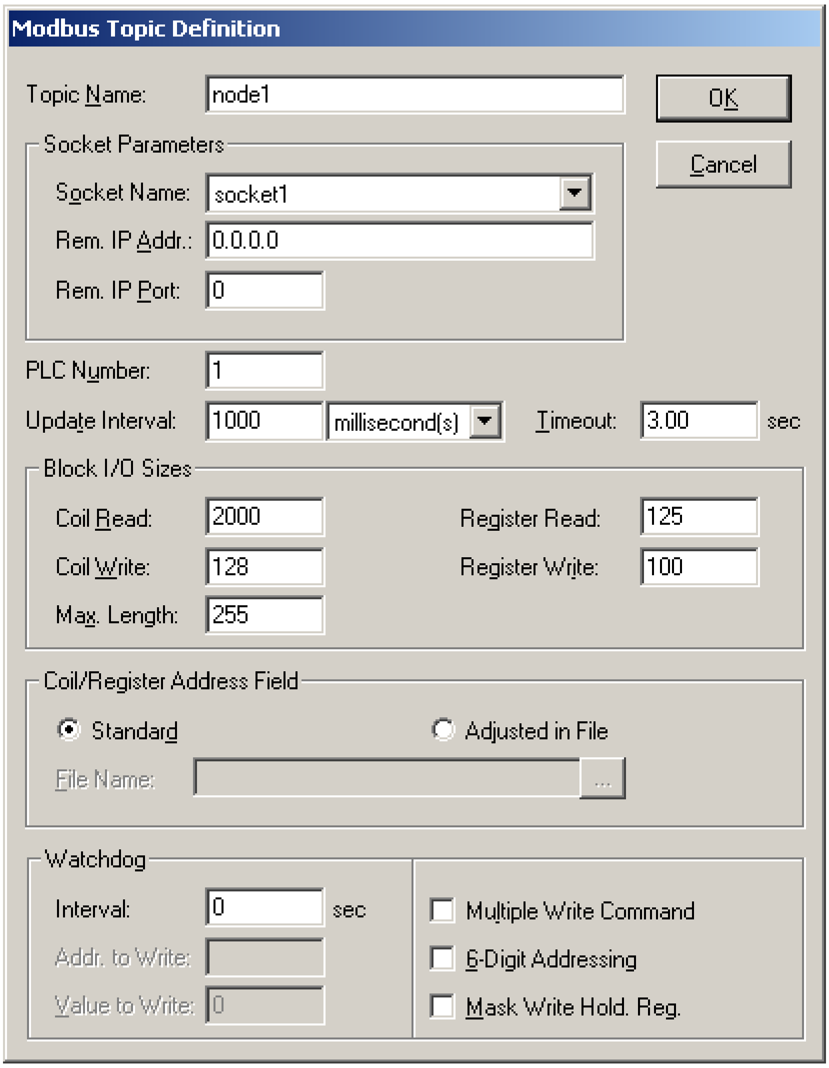
The user provides each MODBUS device with an arbitrary name that is used as the Topic Name for all references to this device.

The following steps are taken to define the Topic attached to a device on MODBUS bus:

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



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



Topic Name: node1

Socket Parameters

Socket Name: socket1

Rem. IP Addr.: 0.0.0.0

Rem. IP Port: 0

PLC Number: 1

Update Interval: 1000 millisecond(s) Timeout: 3.00 sec

Block I/O Sizes

Coil Read: 2000 Register Read: 125

Coil Write: 128 Register Write: 100

Max. Length: 255

Coil/Register Address Field

● Standard ○ Adjusted in File

File Name:

Watchdog

Interval: 0 sec

Addr. to Write:

Value to Write: 0

□ Multiple Write Command

□ 6-Digit Addressing

□ Mask Write Hold. Reg.

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 MODBUSUDP Server with InTouch** section.*

3. Select the **Socket Name** associated with this Topic. In case necessary, enter the **Rem. IP Address** and **Rem. IP Port** from where the connection is permitted (to enable filtering of data received from remote GPRS-modem). As default and as most common practice, leave 0.0.0.0 as Rem. IP Address (any IP address permitted), as usually the IP address is not known (e.g. if connecting from public GPRS network). Leave the Rem. IP Port equal to 0 (default and most common setting) or enter non-zero port number in case remote GPRS-modem port number is known and filtering by port number is required.

4. Enter the **PLC (PC) Station number** – the PLC (remote Modbus device) number on the MODBUS bus.

5. Enter the reply **Timeout** - amount of time (in seconds) the slave PLC (device) using the selected port will be given to reply to commands from the ModbusUDP Server.

6. Enter the value of **Update Interval**, indicating the frequency the items/points on this topic will be read (polled). This is requested update rate - at this frequency the values of all this topic active items must be updated. In real conditions (when large amount of data is requested from device) the real update rate can be longer - the ModbusUDP Server for maximum possible performance will automatically adjust it.

8. Enter the maximum number of consecutive coils (contacts) to be read at time by one read command (**Coil Read** option). Valid values are between 0 and 2000. If **Coil Read** setting is set to zero, then this operation will not be available for selected Topic.

9. Enter the maximum number of consecutive coils that can be written at time by one write command (**Coil Write** option). Valid values can be between 0 and 128. If **Coil Write** setting is set to zero, then this operation will not be available for selected Topic. This option is not relevant in case **Multiple Write Command** is selected.

Note: *To process multiple coils writing in one command - the WIN.INI entry **MultiWrite** (see chapter WIN.INI entries) must be equal to 1 or 2 and **Coil Write** option for corresponding Topic must be configured in "MODBUS Topic Definition" dialog box greater than 1. If **Coil Write** option is equal to 1 then multiple coils writing for corresponding Topic is not processed despite of WIN.INI entry **MultiWrite** value.*

10. Enter the maximum number of consecutive registers to be read at time by one read command (**Register Read** option). Valid values are between 0 and 125. If **Register Read** setting is set to zero, then this operation will not be available for selected Topic.

11. Enter the maximum number of consecutive registers that can be written at time by one write command (**Register Write** option). Valid values can be between 0 and 100. If **Register Write** settiing is set to zero, then this operation wil not be available for selected Topic. This option is not relevant in case **Multiple Write Command** is selected.

Note: *To process multiple registers writing in one command, the WIN.INI entry **MultiWrite** (see chapter WIN.INI entries) must be equal to 1 or 2 and **Register Write** option for corresponding Topic must be configured in "MODBUS Topic Definition" dialog box greater than 1. If **Register Write** option is equal to 1 then multiple registers writing for corresponding Topic is not processed despite of WIN.INI entry **MultiWrite** value.*

Note: *The default Coil Read, Coil Write, Register Read and Register Write settings are optimal from Modbus Server performance point of view. Reduce these default settings only if you suppose that number of data to be processed in one request is too great and the PLC (remote Modbus device) cannot process such data quantity in satisfactory speed.*

12. The **Max. Length** value (maximum length of message) affects the Modbus communication similar way as Coil Read, Coil Write, Register Read and/or Register Write settings. If Coil Read, Coil Write, Register Read and/or Register Write values conflicts with **Max. Length** setting then Modbus Server creates communication commands taking into account the greatest restriction. The default value is 255 bytes.

13. Select the accessible **Coil/Register Address Field** of your PLC (remote Modbus device). If **Standard** option is selected then Modbus Server validates the following

addresses: Coils from 00001 to 09999, Contacts from 10001 to 19999, Input Registers from 30001 to 39999 and Output Registers from 40001 to 49999.

In case your PLC supports limited Address field (some Coils, Contacts or Registers are not accessible) then there may be some communication problems when Server tries to poll inaccessible memory areas. To avoid this problem, the valid Addresses can be presented in an ASCII file. Such file can be created and altered manually with any text editor (do not use a program that formats text, such as MS Word or Write unless the file is saved as a DOS text). Give the name to file that you like, e.g. "AddrFile".

If such file is created, then select **Adjusted in File** option. Now the **File Name** dialog option is accessible. Type the path and name of Address file, e.g. "C:\Modbus\ AddrFile". (You can also press the "Browse File" button. In this case the "Select file" dialog appears. Select your Address file and press "Open" button.) If Address file name is entered then the Server validates only Addresses presented in the file when process current Topic. The following is an example of Address file:

1,3,8-107,30002-30076,40004, 40023, 40097-40200

This example file informs that PLC supports Coils with Addresses 00001, 00003 and all Coils from 00008 to 00107. PLC does not support any Contact. Valid Input registers are from 30002 to 30076. Valid Output registers are 40004, 40023 as well as all registers from 40097 to 40200.

Note: *Valid Addresses must be presented in Address file in the following way. Coils are presented the first, then follows Contacts, then - Input Registers, and then - Output Registers. Items for monitor and control the communication with MODBUS node (see chapter Monitoring and Controlling Communication with MODBUS Bus) are not presented in Address file. Valid Addresses in file are presented as comma-separated individual digits (Addresses) and/or groups of Addresses. Each group of valid Addresses must be presented like the following example: 3-57 (here Coils from 00003 to 00057 are valid, Coils 00002 and 00058 should be invalid). Lower Address in file cannot follow after greater Address. It is not recommended to present a group of consecutive valid Addresses as comma-separated individual Addresses. For example, enter "2-4" instead of "2,3,4".*
Note: *Unique Address file can be created for each Topic. At the same time common Address file can be used for all Topics.*
Note: *Address file can be created for each Topic. At the same time common Address file can be used for all Topics.*

14. Configure the **Watchdog** if PLC user program needs to check, whether there is communication with a computer (running Modbus Server and application) or not. With Watchdog activated the Server periodically writes some predefined value (e.g. 999) into predefined address in PLC’s memory (e.g. into 40100). At the same time the PLC program must periodically check the value in this memory address. If value is equal to Watchdog’s predefined value, then PLC’s program considers communication Status as Good and resets test address to different (non-predefined) value, e.g. to 0. (It will allow to program to check communication state the next time.) If value differs from predefined, then PLC’s program considers communication Status as Bad.

***Note:** Because of time synchronizing problems with PLC and PC it is recommended to consider the communication Status as Bad only after few consecutive test value mismatch cases, not immediately after the first mismatch.*

To activate the **Watchdog** processing - set Watchdog **Time Interval** to non-zero value. Value entered in this field indicates the frequency the Server forwards Watchdog message to corresponding PLC. This value must be equal to time interval the PLC program checks the test address.
Enter **Address to Write** field to indicate address in PLCs memory that is used as Watchdog test address. **Address to Write** must be valid item/point name (see Item Names section.)
***Note:** Use only Output Register areas for Watchdog. Do not take addresses not presented on current PLC configuration. Do not take addresses, used in PLC's program logic.*
Enter integer from 0 to 65535 into the **Value to Write** field to set Watchdog predefined value.
The same value PLC program expects to see in test area.
***Note:** Default Watchdog state is "non-active", it is, Watchdog **Time Interval** is equal to zero.*

15. By checking (or un-checking) the **Multiple Write Command** checkbox, select the type of write commands supported for this Topic: multiple write commands (Modbus functions 15 and 16) if **Multiple Write Command** is checked or single write commands (Modbus functions 5 and 6) if **Multiple Write Command** is not checked. For *Slave* topic - both multiple and single write commands are supported.

16. By checking (or un-checking) the **6-Digit Addresing** checkbox, select whether to use the 5-digits (default) or 6-digits for addressing the item names for connected Modbus device.

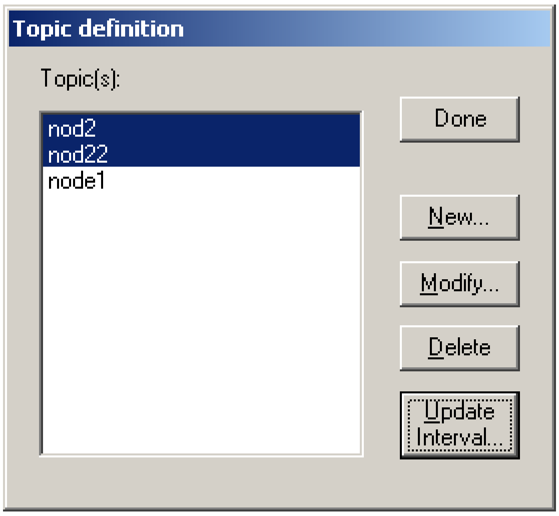
17. By checking (or un-checking) the **Mask Write Hold. Reg.** checkbox, select whether to use the Modbus Function 22 (0x16 in hex) "Mask Write Register" to set or clear individual bits in Holding Registers. This function is applicable for individual bits in registers, see *Item Names* section below in this manual.

By using this function, the performance can be greatly increased in case there are many bit writes executed at time. If **Mask Write Hold. Reg.** is not selected, each bit in register write is executed in two steps: Modbus Server at first reads a register (16-bit word containing this bit) from device to get the current bit value, then Server puts the bit value into this 16-bit word and writes this 16-bit word back to device.

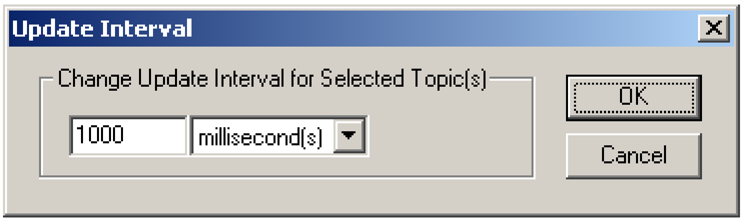
Note!
Before using the Mask Write to Holding Registers, check if connected Modbus device supports this function.

Update Interval for Multiple Topics

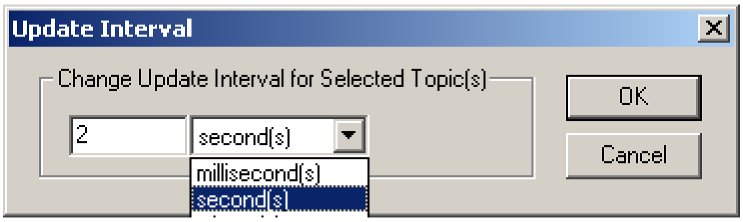
The MODBUS Server supports the possibility to enter the new **Update Interval** value for multiple Topics in a single operation. At first these multiple Topics must be selected in the "Topic Definition" dialog box by holding the CTRL key while clicking on the selected ones:



Then click on **Update Interval…** . The "Update Interval" dialog box will appear:



Enter the new value in the **Update Interval** field and select the appropriate time measuring units (milliseconds, seconds, minutes or hours):



Click on **OK** to change the **Update Interval** value for all selected Topics or click on **Cancel**. The "Topic Definition" dialog box will appear again.

The **Update Interval** can be changed also at run-time (for each Topic separately, not for several ones at once) after Topic is activated by client application (see description of **UPDATEINTERVAL** item in chapter ***Monitoring and Controlling Communication with MODBUS Bus***).

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

Item Names

Within the Modbus GPRS UDP Server, the standard MODICON MODBUS protocol item/point naming is used. In general, the point name consists of 5 or 6 digits (depending of “6-Digit Addressing” selection in “Modbus Topic definition” dialog box) for standard memory areas indication (there are four standard memory areas supported) and 6 digits only – for Extended memory register indication.

Memory area	Item/Point addresses		Access
	5-digits	6-digits	
Binary outputs and binary memories (coils)	00001 – 09999*	000001 – 065535*	Read/ Write
Binary (discrete) inputs	10001 – 19999	100001 – 165535	Read Only**
Register outputs and register memories (holding registers)	40001 – 65000	400001 – 465535	Read/ Write
Input registers	30001 – 39999	300001 – 365535	Read Only**
Extended Memory Registers	600001 – 69xxxx		Read/ Write

* Leading zeroes cannot be excluded in item name.
** Read/Write, if item belongs to Slave topic.

Within standard memory areas the first digit states the memory area the point belongs to. The rest four digits are the point address in the memory area.

Within Extended memory registers addresses are assigned as follows:

File #	Range
1	600001-610000
2	610001-620000
3	620001-630000
4	630001-640000
5	640001-650000
6	650001-660000
7	660001-670000
8	670001-680000
9	680001-690000
10	690001-69xxxx

The **binary items** are 1 bit long; value range is 0 or 1.

For **register items** the MODBUS GPRS UDP Server supports several data formats. The following presents supported data formats and special item naming conventions, indicating corresponding format.

Unsigned/Signed Format

Generally register items are 16 bits long. The server interprets 16-bit word in a PLC in 16-bit unsigned format (value range from 0 to 65535) or signed format (value range from -32768 to 32767). Unsigned quantities may be read by entering item name without suffix. For example, area 40001 in a PLC contains 8000 hex. In this case item name 40001 would be displayed in InTouch or Excel as 32768. Signed quantities may be read from the same channel by appending the suffix '**S**' (or '**s**') to the item name. So, item name 40001S would be displayed in InTouch or Excel as -32768.

Long Format

Two consecutive 16-bit words in a PLC can be interpreted as a 32-bit long integer (value range from -2,147,483,648 to 2,147,483,648). To read/write an item in signed long format - append the letter '**L**' (or '**l**') to the item name. For example, if 40001 contains 1 and 40002 – contains 2, then 40001L returns 65538.

Floating Point Format

Two consecutive 16-bit words in a PLC can be interpreted as a floating point (real) value. For IEEE 32-bit floating point values (-3.402823 * 10+38 to 3.402823 * 10+38) the letter '**F**' or '**f**' must be appended to the item name. For example, if 40001 contains 9620 hex and 40002 - contains 2436 hex, then 40001F returns 3.959212 * 10-17. For floating point IEEE 754 standard, the letter '**R**' or '**r**' must be appended to the item name.

Individual Bits in Register

Individual bits in registers can be read as discrete tags by using the notation **rrrr:b** (or **rrrr:bb** or **rrrr.b** or **rrrr.bb**), where **rrrr** specifies a valid input register, holding register or Extended memory register and **b** (or **bb**) specifies a bit position between 1 and 16 (1 specifies the most significant bit of the register).

Examples:

40001:1	most significant bit of first holding register
30008:16	least significant bit of an input register

Write Only items

In general, outputs (coils and holding registers) are Read/Write, but in some special cases it would be necessary to have Write Only possibility to same addresses. For this purpose the suffix '**W**' (or '**w**') can be added to the item name, for example, 00001w or 400012LW.

VTQ-aware clients besides the value of the point can use also the time stamp and the quality of points. The quality value 0x00C0 indicates “good” quality. If Server cannot refresh the value of item, the item quality is set to “No Access” - 0x0004.

Note: Do not operate with items representing non-defined operands on the node! *It will lead to communication failures.*

Modbus Function 7 (Read Exception Status) Support

Modbus function code 7 obtains the status (ON/OFF) of the eight internal coils, which addresses are controller dependent. User logic can program these coils to indicate slave status. The short length of response message allows the rapid reading of status. To use function code 7, the **exception_status** item (I/O integer) is created. Modbus Server creates additional separate message if **exception_status** item is active. This message is sent to PLC with Topic update interval.

Modbus Function 8 (Diagnostics) Support

Modbus function code 8 provides a series of tests of checking the communication system between a client device (if using Modbus Server it is a Server itself) and a slave device (e.g. PLC). The following explains the item naming supported by Modbus Server to control Modbus function 8 processing.

Important!
Function 8 is supported only in serial communication and only with Master ports.

1. Sub-functions for PLC control

The following sub-functions are supported:

00 (0 dec) - Return Query Data
01 (1 dec) - Restart Communications Option
04 (4 dec) - Force Listen Only Mode
0A (10 dec) - Clear Counters and Diagnostic Register
14 (20 dec) - Clear Overrun Counter and Flag

Important!
The sub-function code in item/point names described below must be in decimal format, for example, DIAG10, not DIAG0A.

To control the sub-function execution, three I/O items can be created in client application (e.g. InTouch) for each sub-function:

DIAGxx, I/O Discrete. Mandatory used. When application changes value from 0 to 1, then it causes execution of command with sub-code **xx**. To repeat the command execution – client application must set **DIAGxx** to 0, and then - again to 1.

REZxx, I/O Discrete. Optionally used. Indicates the result of command with sub-code **xx** execution. If = 1 then it means the command with sub-code xx was executed successfully, and = 0 when no response from PLC received.

DATAxx, I/O Integer. Optionally used. 2 bytes long value to be put into Data Field of request command - if data field value is relevant for sub-code. Relevant Data Field value is for sub-function 01 (Restart Communications Option, possible values 0 or 0xFF00).

For example, the processing of sub-function 01 (Restart Communications Option) with Communication Event Log to be cleared:

Client application must activate items DIAG01, DATA01 and (optionally) REZ01 and do the following:

1. write value 0xFF00 into DATA01 item
2. write value 1 into discrete item DIAG01,
3. check, whether value of REZ01 changes from 0 to 1, and, if not changes, reset DIAG01 to 0 and again to 1.

Note:
Most of PLC control sub-functions can be controlled with only one item – **DIAGxx**. Using of **REZxx** item is optionally in all cases. With **DATAxx** the following principals are implemented in Server:

- if **DATAxx** data item is not created by application at all, then Server processes command with default Data Field value 0 (zero).
- If **DATAxx** data item is created by application, then Server processes command with Data Field value, that application writes into **DATAxx**. If **DATAxx** is created, then Server never executes corresponding sub-function until value is assigned to **DATAxx**.

2. Sub-functions for reading diagnostic information from PLC
The following sub-functions are supported:

02 (2 dec) - Return Diagnostic Register
0B (11 dec) - Return Bus Message Count
0C (12 dec) - Return Bus Communication Error Count
0D (13 dec) - Return Bus Exception Error Count
0E (14 dec) - Return Slave Message Count
0F (15 dec) - Return Slave No Response Count
10 (16 dec) - Return Slave NAK Count
11 (17 dec) - Return Slave Busy Count
12 (18 dec) - Return Bus Character Overrun Count

To control the execution of read sub-function - one I/O item is created in client application for each sub-function:

DATAxx, I/O Integer. 2-bytes long value of Data Field from PLC response. **xx** – the code (in decimal format) of sub-function.

To enable the Server processes the read command with sub-code xx, client application must activate the I/O item DATAxx. The corresponding command will be sent to PLC according to Topic update interval. To execute diagnostic reading at different update rate, a separate Topic must be created for all (or several) DATAxx I/O items.

If separate Topic is used for diagnostics items – the communication Status item of Topic indicates the status of command 08 execution.

For example, to get Diagnostic Register contents (sub-function 02) – create and poll the I/O item DATA02. The value of DATA02 will be the current contents of Diagnostic Register.

Monitoring and Controlling Communication with MODBUS Bus

For each master topic, there are following additional items offered by ModbusUDP Server to monitor and control the communication with MODBUS node.

STATUS

For each topic, there is a built-in discrete item that indicates the state of communication with MODBUS node. The discrete item (**STATUS**) is set to **0** when communication fails and set to **1** when communication is successful.

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:

=MODBUSUDP|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). It indicates the current requested update interval (in milliseconds). The value of this item can be read through DDE or Suite Link. 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). The **ERRORITEMS** value can be reset 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 ModbusUDP Server with OPC Clients

The **"OPC & DDE"** version of ModbusUDP Server is accessible from OPC Clients.

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

1. Run OPC Client application and select the "ModbusUDP OPC and DDE Server" from the list of available OPC Servers. If ModbusUDP 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 MODBUS 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 MODBUS Topic definition.

   c) By browsing the server address space.

By default the ModbusUDP Server is installed and used as a local OPC Server - both OPC Server and OPC Client reside on same computer. The ModbusUDP 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

After ModbusUDP Server "OPC & DDE" version installation, the System Administrator must configure DCOM by DCOM configuration program - by **Dcomcnfg.exe** system tool. This utility is located in the Windows system directory - e.g. in \Windows\system32. After starting Dcomcnfg.exe, select **ModbusUDP OPC & DDE Server** on **Applications** page and click on **Properties -** the “ModbusUDP OPC & DDE Server Properties” window will appear. All further configuration is to be done from there.

Configuring DCOM to access ModbusUDP Server as a local OPC Server

To access ModbusUDP OPC & DDE Server as a local OPC server:

Authentication level can be any of:
(None)
Call
Connect
Default
Packet
Packet Integrity
Packet Privacy

Location
“Run application on this computer” must be checked.

Security/access permissions - default access permissions can be used in case using ModbusUDP OPC & DDE Server as local OPC server. If it is necessary to access ModbusUDP OPC & DDE Server from local OPC Clients configured as **services**, then **Allow Access** permission must be configured for **SYSTEM** and for all users, which need access to the ModbusUDP OPC & DDE Server.

Security/launch permissions - **Allow Launch** must be specified for each user, which launches OPC Client on local machine. Typically specify **Allow Launch** for “Users” group. If is necessary to access ModbusUDP OPC & DDE Server from local OPC Clients configured as **Services** then **Allow Launch** permission must be configured for **SYSTEM** also.

Security/configuration permissions
Administrators - **Full Control**
CREATOR OWNER - **Full Control**
SYSTEM - **Full Control**
Full Control for all users, which have permission to register MODBUS OPC & DDE Server as OPC server. For users, which have permission to read data from OPC server the sufficient permission is **Read**.

Note *- OPC server registration and unregistration is silent. No error messages are displayed if operation is unavailable due to permission restrictions.*

Identify

Identify has to be **The launching user**. In case of using ModbusUDP OPC & DDE Server as local OPC server, the **Identify** can be also **The interactive user**, but this setting will not work if user is not logged on and OPC Clients which are running as **Services** will not be able to connect to ModbusUDP OPC & DDE Server while user is not logged on computer.

Also **This user** can be selected. In this case ModbusUDP OPC & DDE Server will be invisible on the screen and ModbusUDP OPC & DDE Server user interface will be inaccessible. If user is different as user logged on then ModbusUDP OPC & DDE Server cannot be terminated by Task Manager. The user specified in this setting can be any user which have access to hardware and software resources used by ModbusUDP OPC & DDE Server. This user can be without permission to launch or configure ModbusUDP OPC & DDE Server specified in the **Security** page of DCOM configuration program.

Configuring DCOM to access ModbusUDP Server as a remote OPC Server

To access ModbusUDP OPC & DDE Server as a remote OPC server (form remote computer) and to browse available OPC Servers, at first you have to configure DCOM settings for **OPCEnum.exe** both on server and client computers**.** The OPCEnum.exe, opccomn_ps.dll and OPCProxy.dll must be installed and registered on both - server and client computers and ModbusUDP OPC & DDE Server must be installed and registered on computer where it will run. For some OPC clients it may be necessary to register ModbusUDP OPC & DDE Server on client computer.

OPCEnum

OPCEnum is used to browse OPC servers on local or remote computer the DCOM settings for OPCEnum.exe are following:

Location

“Run application on this computer” - must be checked on both computers.

Security/access permissions can be default.

Security/launch permissions

Launch permission must be set for each user, which can be able to configure OPC items on OPC Server computer. On the client computer OPCEnum launch permissions can be default, but some OPC clients may handle this situation incorrectly, therefore it is better to assign launch permission for users working on remote OPC client computer.

Security/configuration permissions

SYSTEM must have at least **Read** permission on OPC Server computer. On OPC Client computers at least **Read** permission must be set for users working with OPC clients. Administrators must have **Full Control** permission on both computers, otherwise nobody can be able to configure or unregister OPCEnum.

Identify

On GSM-Control OPC Server computer the **Identify** must be set to **The interactive User**. On remote OPC Client computer it can be **The interactive user** or **The launching user**.

DCOM Settings for ModbusUDP OPC & DDE Server as remote OPC Server:

Location - “Run application on this computer” must be checked.

Security/access permissions can be default. If ModbusUDP OPC & DDE Server is running as **Service**, then **Allow Access** permission should be set for **NETWORK** and remote OPC client computers.

Security/launch permissions must be set to **NETWORK** and for users working on remote client computers.

Security/configuration permissions - **Read** must be set for **NETWORK** and for users working on remote OPC client computers.

Identify - **The interactive user** must be selected.

Most frequent errors when configuring DCOM

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 ModbusUDP "OPC & DDE" version as Windows Service

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

MODBUSUDP /Service

After this the " ModbusUDP OPC & DDE Server" Service will be installed with Startup type "Manual". The Service Startup configuration can be changed by MS Windows *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 **ModbusUDP OPC & DDE Server** is selected). If **Allow Service to Interact with Desktop** is not selected then ModbusUDP Server full functionality is not ensured (e.g. the Server configuration can not be changed, no message boxes will be displayed, etc.).

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

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

MODBUSUDP /DelService

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

Using ModbusUDP Server 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 ModbusUDP 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 ModbusUDP Server then there must be one or more topics defined for ModbusUDP 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 (**ModbusUDP.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. **node2.**) 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 ModbusUDP Server can be obtained by clicking on "Browse" button (this allows to view the ModbusUDP 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 ModbusUDP Server.

Browse
Clicking on this button initiates the browsing through exposed address space of ModbusUDP 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.

Accessing ModbusUDP 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 ModbusUDP 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, **PLC2**.
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 MODBUS Server. Some examples of possible item names acceptable by OPCLink Server/ ModbusUDP Server connection:

D00001
Discrete
Binary output, address 1;
I30002
Integer
Register input, address 2.

Using the ModbusUDP Server with Suite Link and DDE Clients

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

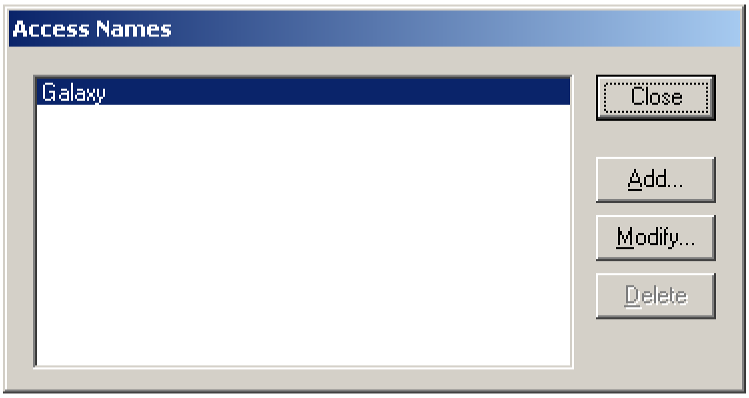
Using the ModbusUDP Server with InTouch

To access items/points on a MODBUS node from **InTouch**, the Access Names and Tag names should be defined in **WindowMaker**.

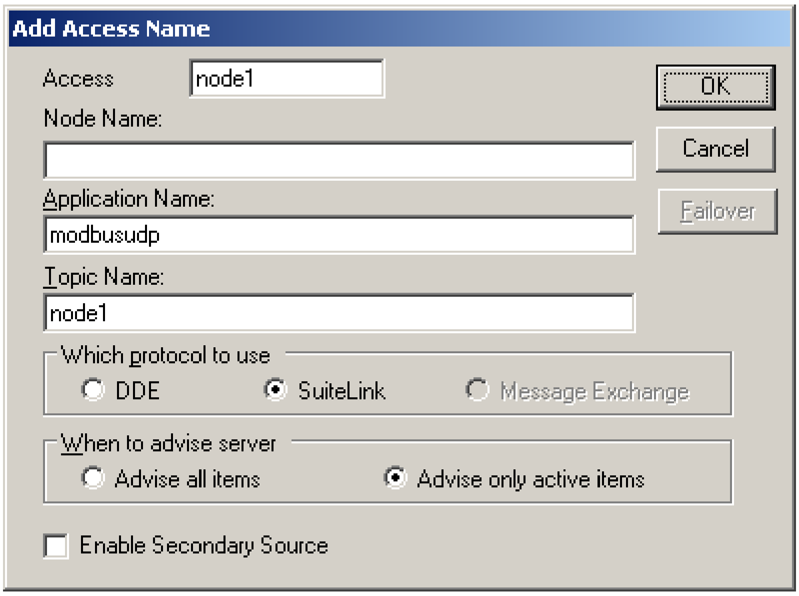
Defining the Access Names

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:



Add Access Name

Access: node1

Node Name:

Application Name: modbusudp

Topic Name: node1

Which protocol to use: ○ DDE ● SuiteLink ○ Message Exchange

When to advise server: ○ Advise all items ● Advise only active items

□ Enable Secondary Source

***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 ModbusUDP GPRS UDP Server, the MODBUSUDP is used. Do not enter the .exe extension portion of the program name.

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

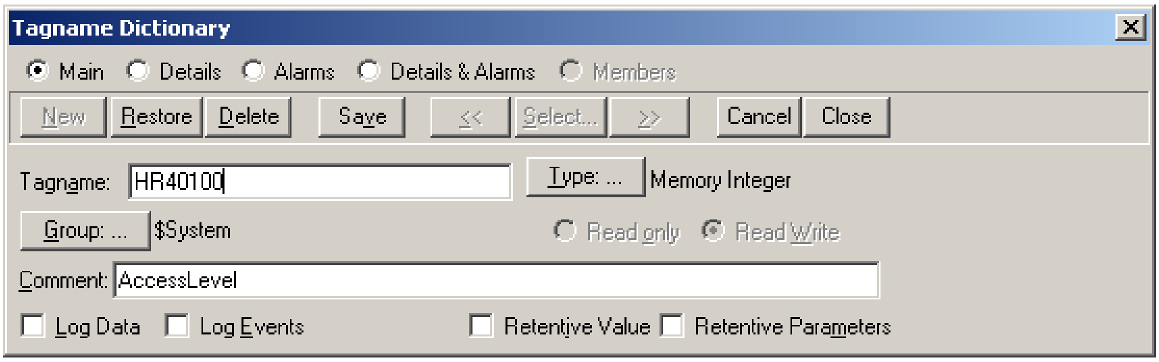
Select **Advise only active items** if you want the Server program to poll only points in visible windows and points that are alarmed, logged, trended or used in any script.

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:



● Main ○ Details ○ Alarms ○ Details & Alarms ○ Members

Tagname: HR40100

Memory Integer

$System

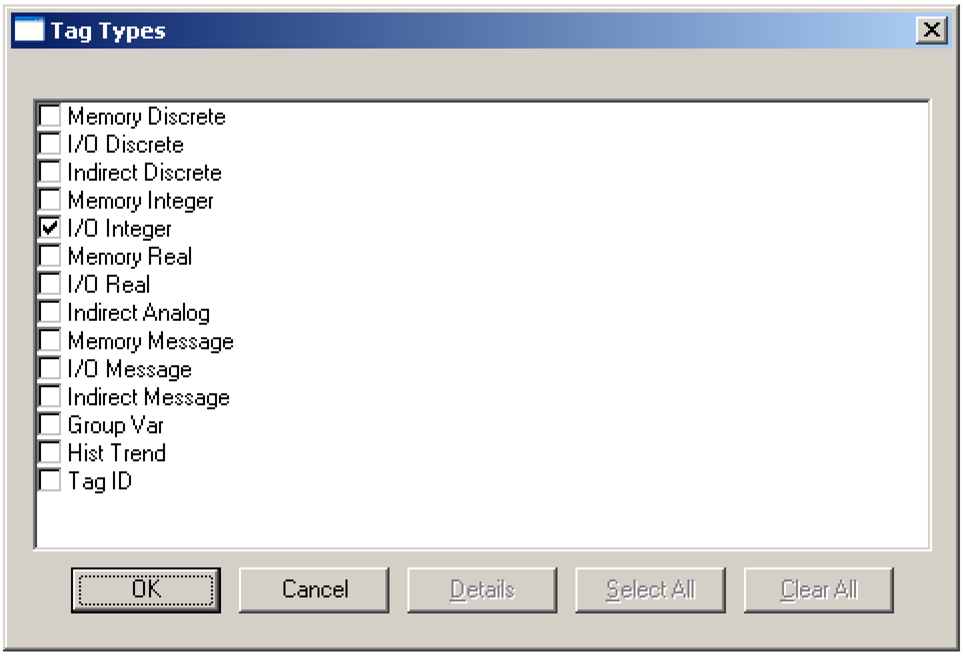
○ Read only ● Read Write

Comment: AccessLevel

□ Log Data □ Log Events □ Retentive Value □ Retentive Parameters

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

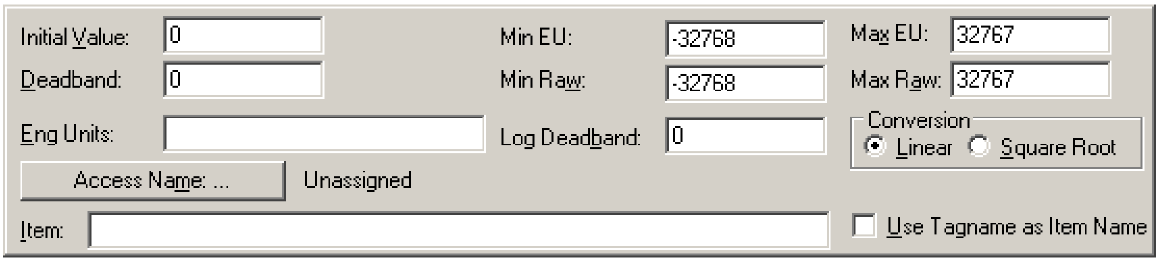
Select the tag type by clicking on the **Type:…** button. The "Tag Types" dialog box will appear:



- □ Memory Discrete
- □ I/O Discrete
- □ Indirect Discrete
- □ Memory Integer
- ☑ I/O Integer
- □ Memory Real
- □ I/O Real
- □ Indirect Analog
- □ Memory Message
- □ I/O Message
- □ Indirect Message
- □ Group Var
- □ Hist Trend
- □ Tag ID

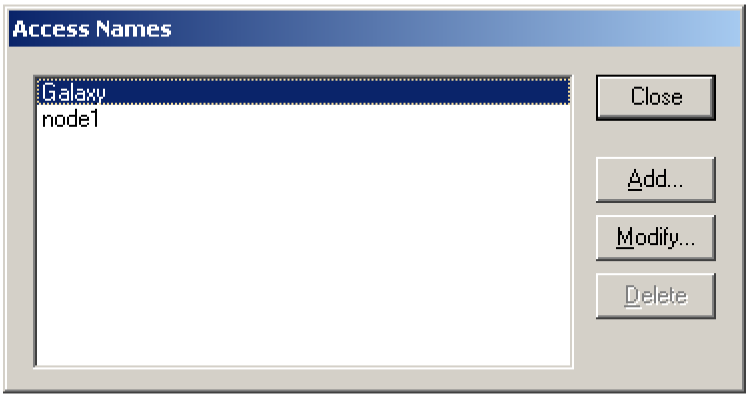
To access ModbusUDP items, the type must be **I/O Discrete**, **I/O Integer**, **I/O Real** or **I/O Message**. Select the Tag type.

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



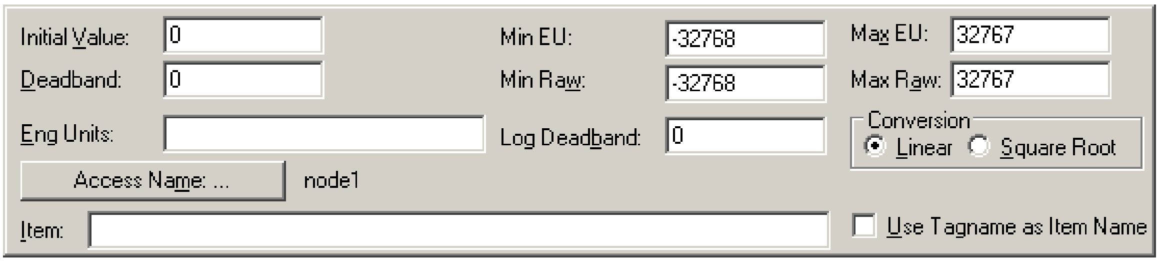
Initial Value: 0
Deadband: 0
Eng Units:
Access Name: Unassigned
Item:
Min EU: -32768
Min Raw: -32768
Log Deadband: 0
Max EU: 32767
Max Raw: 32767
Conversion: ● Linear ○ Square Root
□ Use Tagname as Item Name

Select the Access Name for MODBUS GPRS UDP Server by clicking on the **Access Name:…** button. The "Access Names" dialog box will appear:



Galaxy
node1

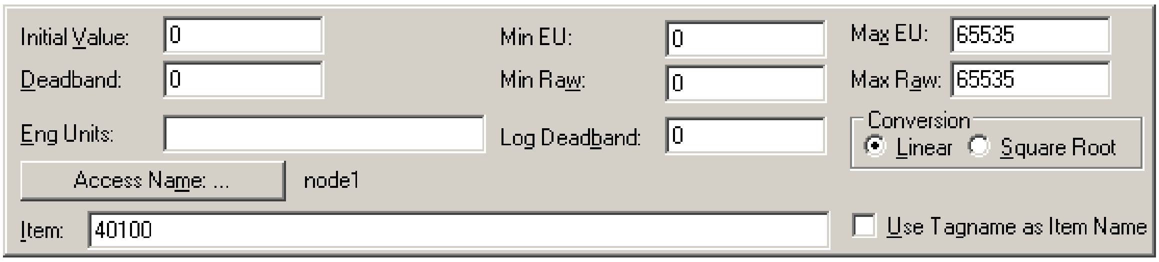
Select the appropriate Access Name and click on **Close**. (If the Access Name has not been defined as previously described, click on **Add** and define the Access Name now.) The "Details" dialog box will appear displaying the selected Access Name:



Initial Value: 0
Deadband: 0
Eng Units:
Min EU: -32768
Min Raw: -32768
Log Deadband: 0
Max EU: 32767
Max Raw: 32767
Conversion: ● Linear ○ Square Root
Access Name: ... node1
Item:
□ Use Tagname as Item Name

For integers 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 a ModbusUDP item name to be associated with this tagname in the **Item:** field in the "Details" box:



Initial Value: 0
Deadband: 0
Eng Units:
Min EU: 0
Min Raw: 0
Log Deadband: 0
Max EU: 65535
Max Raw: 65535
Conversion: ● Linear ○ Square Root
Access Name: ... node1
Item: 40100
□ Use Tagname as Item Name

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

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 **NODE1** is the Topic Name configured for ModbusUDP Server):

=view|DDEStatus! NODE1 or **=view|IOStatus! NODE1**

Notes on Using Microsoft Excel

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

```
=MODBUSUDP|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:

```
=MODBUSUDP|'NODE1'!'40100'
= MODBUSUDP |'MODBUS'!'00033'
= MODBUSUDP |'node'!'30111'
```

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

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

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

channel=INITIATE("MODBUS","topicname")
Opens a channel to a specific topic name (defined in the Server) in an application with name MODBUSUDP (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 MODBUS node) 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 **NODE1**item **40100**:

```
PokeMacro -Ctrl a
=INITIATE("MODBUSUDP","NODE1")
=POKE(A2,"40100",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 ModbusUDP 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:\WINDOWS). 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 a DOS text*). The following is a typical entry for the ModbusUDP Server:

```
 [MODBUSUDP]
WinIconic=0
WinFullScreen=0
WinTop=112
WinLeft=0
WinWidth=200
WinHeight=168
```

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

MultiWrite

The **MultiWrite** entry is used to enter the data writing principles for the Server. The following values can be entered.

(1) If **MultiWrite=0** (default value) then for each new write value a separate write message is created. Only one write message is executed per scan. The values in the PLC are changed by the Server in the same sequence as they are changed in the user (client) application. In this case the data update rate is low if application changes values very frequently.

(2) If **MultiWrite=1** then the same message can be used for the writing of new values into the consecutive memory addresses for the same memory area (for example, into 40001, 40002, 40003...). Up to 128 consecutive values can be included in the same write command depending on configured Block I/O Sizes (Coil Write and Register Write) in the "Modbus Topic Definition" dialog box (see chapter Topic Definition Command). The new value can be added only to the end of the last write message (last message in the list of pending write messages). Therefore some values may be written into the PLC memory simultaneously even if the client application changes them step-by-step. In this case the writing speed can be seriously increased.

For example, the client application sequentially changes the values of following 100 items: 40001, 40002, ... , 40100 and the values of following 100 items: 00001, 00002, ... , 00100. In this case the Server creates only two write messages to write the new values for all the changed items. If the values of the same Items are changed in the following sequence: 40001, 00001, 40002, 00002, 40003, ... then Server creates a separate write message for the each new write value.

(3) If **MultiWrite=2** then the Server tries to include the new write value into the some of previously created messages ignoring the sequence of data changing in the client

application. Important! If **MultiWrite=2** then maximum writing speed is achieved, but this option is not recommended if data changing sequence is important for PLC program!

SlowPollRetries and SlowPollInterval

The **SlowPollRetries** entry is used to enter the number of consecutive error retries for one topic (Node). If after **SlowPollRetries** there is still no successful response from MODBUS node, then this topic is set 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 3 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 5 consecutive unsuccessful retries:

SlowPollRetries=5
SlowPollInterval=120

Entering the slow poll mode is reported to WWLogger by following string:

"Set slow poll mode - poll after each <SlowPollInterval * 1000> msecs. Stop error logging to Topic <TOPICNAME>."

Leaving the slow poll mode is reported to WWLogger by following string:

"Port <PORTNAME>; return to normal communication to Topic <TOPICNAME>."

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 WIN.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 overfill with memory allocated for write messages.*

ConsecutiveWriteErrors

The **ConsecutiveWriteErrors** entry is used to enter the number of consecutive unsuccessful write retries for one write command. If after **ConsecutiveWriteErrors** the write command still is not executed then write command is deleted from the list of active (pending) write messages and write is finally rejected. If the total amount of messages in the list of active write messages exceed 300 then every write message is performed only once not taking into account the **ConsecutiveWriteErrors** value.

The default **ConsecutiveWriteErrors** value is 5 (used if WIN.INI file does not contain this entry).

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 window):

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

ShowEvents - if checked then Server logs the information about situations when the total number of active (pending) write messages exceeds 300. It may happen when the Server has timing problems when executing write commands. When such warnings appear then it is recommended to modify the Server timing settings or to reduce the total amount of write data in the client application. Otherwise the possibility of loosing write data increases.
Information about suspended and resumed topics also is displayed if ShowEvents is checked.

Show Send - if checked then all outgoing user data is displayed.

Show Receive - if checked then all incoming user data is displayed.

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

ShowBadWrites - if checked then Server displays information about all situations when data write commands are not executed successfully and after **ConsecutiveWriteErrors** retries the write is rejected and write message is deleted from list of active (pending) write messages. This option (if checked) is effective even if other error logging is stopped.

ShowAllRejectedWrites - option is useful when communication with a separate topic (topics) is suspended by Item SUSPEND (see ***Item Names*** section) and the Server rejects each write to this topic (topics). If checked then information about each rejected write value is reported to Wonderware Logger and (or) to ModbusUDP Server Internal Logger. If not checked (default) then Server rejects each write to suspended topic(s) without logging any information.

Verbose - if checked then additional debugging information is displayed. This option is useful for getting additional information about error situations:

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

DumpScreen - if checked information about active topics and messages is displayed in ModbusUDP Server main window.

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

MODBUSUDP_YYYYMMDD.LOGn

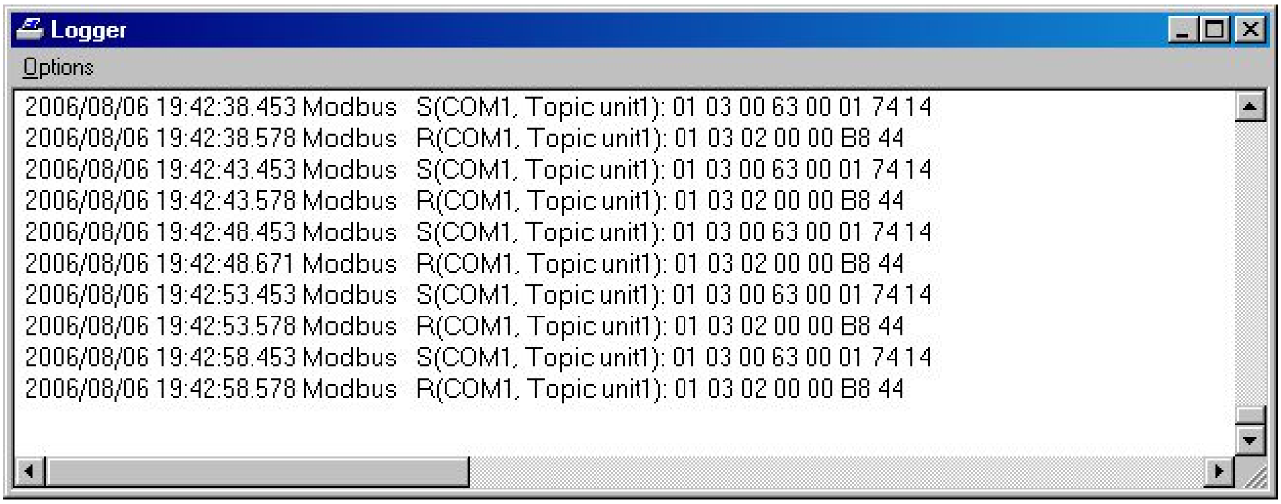
where **YYYY** is a year, **MM** is a month, **DD** is a day and **n** is a order number of consecutive ModbusUDP Server Internal Logger file, starting from 1 (the ModbusUDP Server Internal Logger file maximum size is 16 MB; if there is more information logged then next consecutive file is created, e.g. there can be consecutive files MODBUSUDP_19990413.LOG1, MODBUSUDP_19990413.LOG2, etc.).

All debugging information (except **DumpScreen** option) is displayed via the Wonderware Logger or (and) ModbusUDP Server Internal Logger if Show Logger checked, which must be active for these commands to work.

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

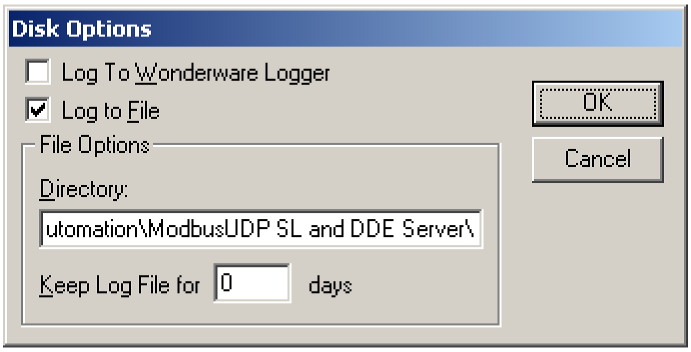
Internal Logger

To enable the ModbusUDP Server Internal Logger, check the **Show Logger** option at the ModbusUDP 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:



```
2006/08/06 19:42:38.453 Modbus   S(COM1, Topic unit1): 01 03 00 63 00 01 74 14
2006/08/06 19:42:38.578 Modbus   R(COM1, Topic unit1): 01 03 02 00 00 B8 44
2006/08/06 19:42:43.453 Modbus   S(COM1, Topic unit1): 01 03 00 63 00 01 74 14
2006/08/06 19:42:43.578 Modbus   R(COM1, Topic unit1): 01 03 02 00 00 B8 44
2006/08/06 19:42:48.453 Modbus   S(COM1, Topic unit1): 01 03 00 63 00 01 74 14
2006/08/06 19:42:48.671 Modbus   R(COM1, Topic unit1): 01 03 02 00 00 B8 44
2006/08/06 19:42:53.453 Modbus   S(COM1, Topic unit1): 01 03 00 63 00 01 74 14
2006/08/06 19:42:53.578 Modbus   R(COM1, Topic unit1): 01 03 02 00 00 B8 44
2006/08/06 19:42:58.453 Modbus   S(COM1, Topic unit1): 01 03 00 63 00 01 74 14
2006/08/06 19:42:58.578 Modbus   R(COM1, Topic unit1): 01 03 02 00 00 B8 44
```

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


Disk Options

□ Log To Wonderware Logger

☑ Log to File

File Options

Directory: utomation\ModbusUDP SL and DDE Server\

Keep Log File for 0 days

The following can be entered in this dialog box:

Log to Wonderware Logger
If checked then debug information will be logged also to Wonderware Logger or Log Viewer (if installed).

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

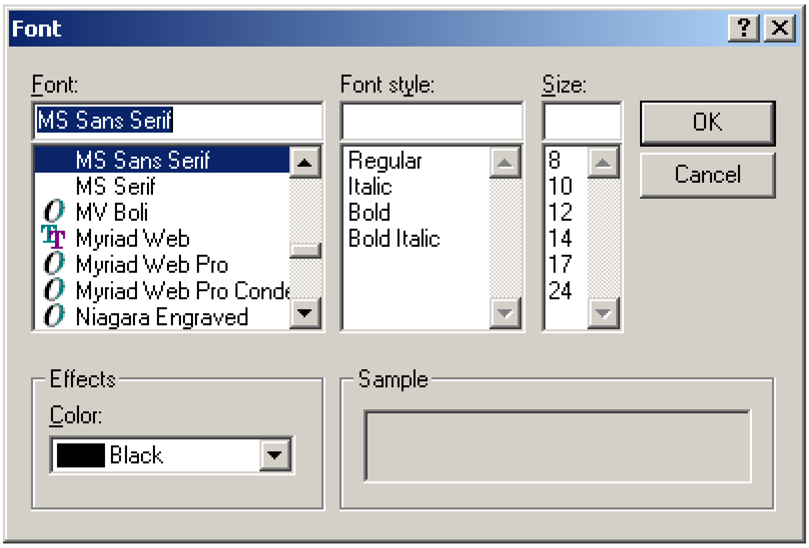
MODBUSUDP _YYYYMMDD.LOGn

where **YYYY** is a year, **MM** is a month, **DD** is a day and **n** is a order number of consecutive ModbusUDP Server Internal Logger file, starting from 1. The ModbusUDP Server 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 MODBUSUDP _20030228.LOG1, MODBUSUDP _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.

Options/Font
To configure the font used by Internal Logger, select *Options/Font…* from Internal Logger main menu - the “Font” dialog box will appear:



Font: MS Sans Serif

Color: Black

KLINKMANN AUTOMATION
MODBUS GPRS UDP Communication Server
Revision History

May 2012	Rev 1.0	First Release
May 2013	Rev1.1	“Installing the MODBUS GPRS UDP Server” section modified, “Licensing by using HASP HL key” and “Software license key” sub-sections added.