USS
DDE
Server

for Microsoft Windows
and InTouch Applications

User Manual
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USS DDE Server

The **USS DDE Server** (hereafter referred to as the **USS** Server) is a Microsoft Windows 32-bit application program that acts as a DDE (Dynamic Data Exchange) *Server* and allows other Windows application programs an access to data from converter devices supporting USS protocol (MICRO MASTER, 6SE21, 6RA24, 6RA22 etc.).

The *Server* is primarily intended for use with **Wonderware InTouch**, but it may be used by any Microsoft Windows program that is capable of acting as a DDE *Client.*

What is DDE?

DDE is a complete communication protocol designed 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 **InTouch** and Excel can simultaneously be both a *client* and a *server.*

To obtain data from another application the *client* program opens a channel to the *server* application by specifying three things: the *server* ***application name***, the ***topic name*** and the specific ***item name***. For example, in the case of Excel, the application name is "Excel", the topic name is the name of the specific spreadsheet that contains the data and the item name is the specific cell on the spreadsheet. With **InTouch** the application name is "View", the topic name is the word "Tagname" when reading/writing to an **InTouch** tag name and the item name is a specific tag name in the **InTouch** Data Dictionary.

When a *client* application sets up a link to another DDE program, it requests the *server* application to *advise* the client whenever a specific item's value changes. These data links will remain active until either the *client* or *server* program terminates the link or the conversation. They are a very efficient means of exchanging data because when the link has been established no communication occurs until the specified data value changes. **InTouch** uses DDE to communicate with DDE Servers and other DDE application programs.

Accessing a Remote DDE Item from USS

The DDE protocol identifies an element of data by using a three-part address, including: ***Application, Topic*** and ***Item***.

Application refers to the name of the Windows program (server) that knows how to access the data element. For the USS Server the application portion of the DDE address is **USS**.

Topic is an application-specific sub-group of data elements. The USS Server considers each converter device to be a separate topic. The user creates a meaningful name for each device and uses this name as the topic name for DDE references.

Item indicates a specific data element within the specified topic. For the USS Server, an item is Converter's internal Parameter or Process Data Word (or Bit of Process Data Word) of communication message. (The item/point names are described in the ***Item (Point) Naming*** and ***Item (Point) Naming for 6RA22*** section.)
Note: *In some cases, the term "point" is used interchangeably with the term "item".*

Installing the USS Server

The USS DDE Server installation package can be supplied:

1. As a self-extracting archive 15010xxx.EXE if downloaded from Klinkmann's web site (the xxx is the current (latest) version of the Server).
2. From installation on CD.
3. On two or three distribution disks (floppies).

To **install** the USS DDE Server from the self-extracting archive, run the 15010xxx.EXE and proceed as directed by the USS Server Setup program.

To install the USS DDE Server, on Windows (NT, 2000, XP or 95 (98)):

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

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

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

USS.HLP The USS Server Help file.

USS.CFG An example configuration file.

LICENSE.TXT Klinkmann Automation software license file.

WWCOMDLG.DLL Dynamic Link Library necessary for USS Server.

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

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

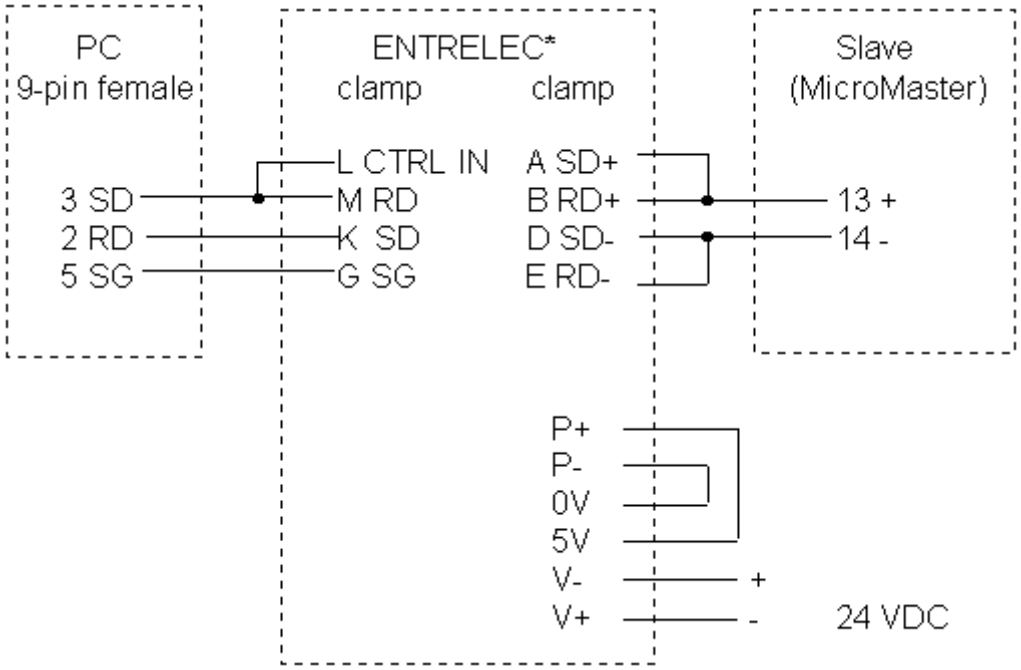
Wiring Diagram

The run-time system consists of one or several converter devices (slaves) connected to the host computer. The RS232 serial interface is used at computer side and RS232/RS485 converter must be used to communicate with converter devices. The RS232 to RS485 converter must *ensure* alternately (never at the same time) activation of the Receiver and the Transmitter (the RTS signal is not generated by host computer and therefore if the RS232 to RS485 converter uses RTS signal at RS232 side then RTS line must be connected to host computer Transmitter line - see example wiring diagram).

The USS DDE Server is tested with the ENTRELEC model ILPH RS232/RS422-RS485 Serial Link Interface configured as RS485 link on one pair and where the activation of the Receiver and the Transmitter is performed depending on the status of the CTRL IN signal.

The following wiring diagram is useful if ENTRELEC converter is used to connect PC and a slave (MicroMaster).

The RS232 between PC and ENTRELEC, RS485 between ENTRELEC and MicroMaster:

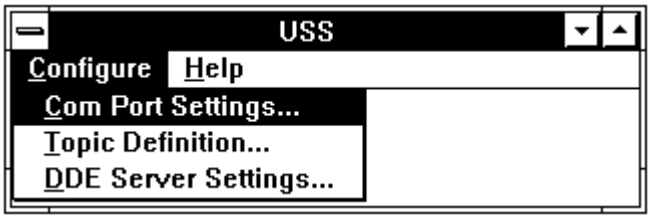


***** Jumpers: Rt = 120 ohms, R = ON/OFF, E = ON/OFF.

Configuring the USS Server

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

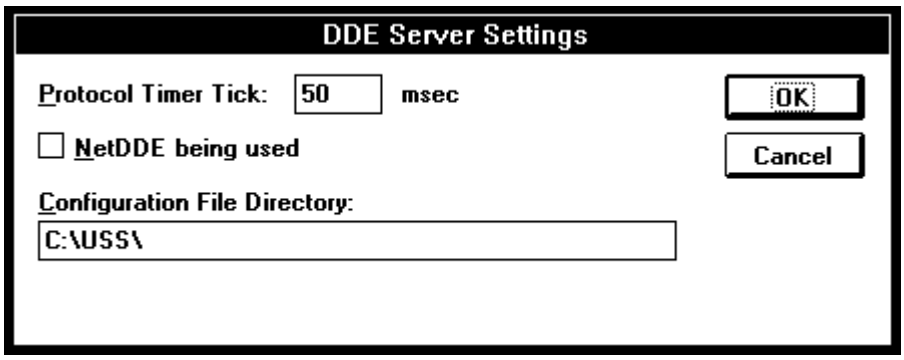
To perform the required configurations, start the USS program. If the Server starts up as an icon then double-click on the icon to open the server's window. To access the commands used for various configurations, open the */Configure* menu:



DDE Server Settings Command

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

To change the Server's internal parameters, invoke the *DDE Server Settings...* command. The "DDE Server Settings" dialog box will appear:



The following describes each field in this dialog box:

Protocol Timer Tick
This field is used to change the frequency at which the Server checks for work to do (at this frequency one message is sent to the network and one reply from network is processed). This should be approximately 2 to 4 times faster than rate desired to update data from the network.

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

Configuration File Directory
This field is used to specify the path (disk drive and directory) in which USS will save its current configuration file. The USS Server will use this path to load the configuration file the next time it is started.

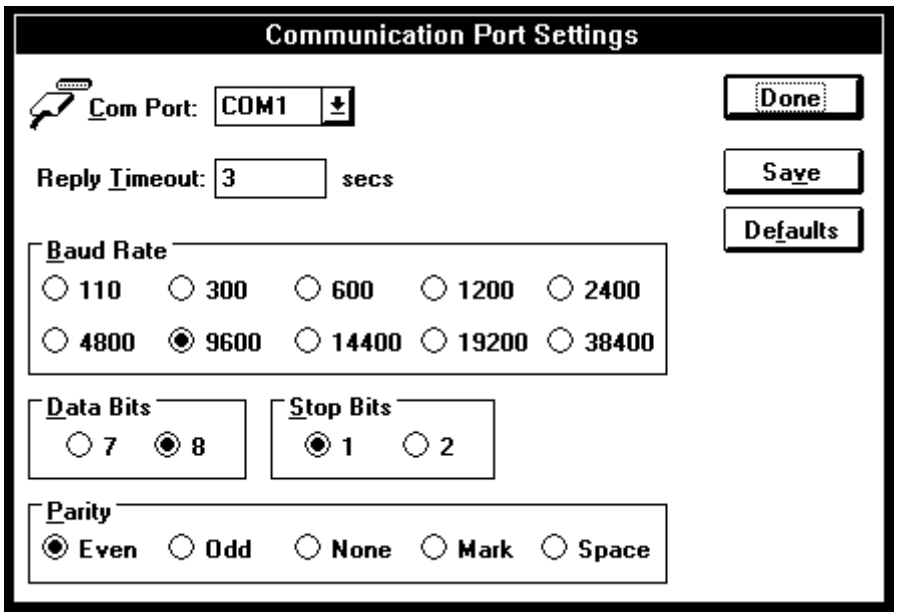
Note: *Only the "path" may be modified with this field. The configuration file is always named* ***USS.CFG.***

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

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

Com Port Settings Command

This command is used to configure the communication port that will be used to communicate with converters. Invoke the *Com Port Settings...* command. The "Communication Port Settings" dialog box will appear:



The following describes each field in this dialog box.

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

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

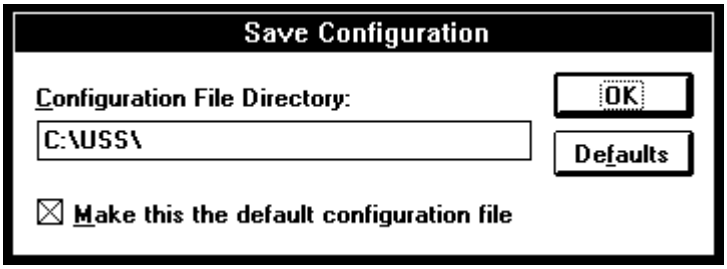
Baud Rate
The selected Baud Rate must match the converter setting.
Note: *The default Baud Rate is 9600.*

Other communication parameters are following: *8 Data Bits, 1 Stop Bit, Even Parity*. These parameters cannot be changed.

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

Saving USS Configuration File

If the configuration file does not currently exist, or a new configuration path has been specified, the Server will display the "Save Configuration" dialog box:



This dialog box displays the path where the Server is going to save the current configuration file. The path may be changed if necessary. Also, the path can optionally be recorded in the **WIN.INI** file by selecting the **"Make this the default configuration file"** option. Doing so it will allow the USS Server to find the configuration file automatically each time it is started.

Configuration File Location

When the USS Server starts up, it first attempts to locate it's configuration file by first checking the **WIN.INI** file for a path that was previously specified. If the path is not present in the **WIN.INI** file, the Server will assume that the current working directory is to be used.

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

USS /d:c:\directoryname

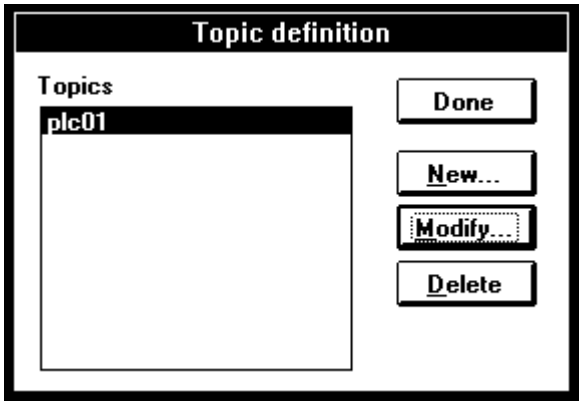
Note: *There is no limit to the number of configuration files that may be created, although each must be in a separate directory.*

Topic Definition Command

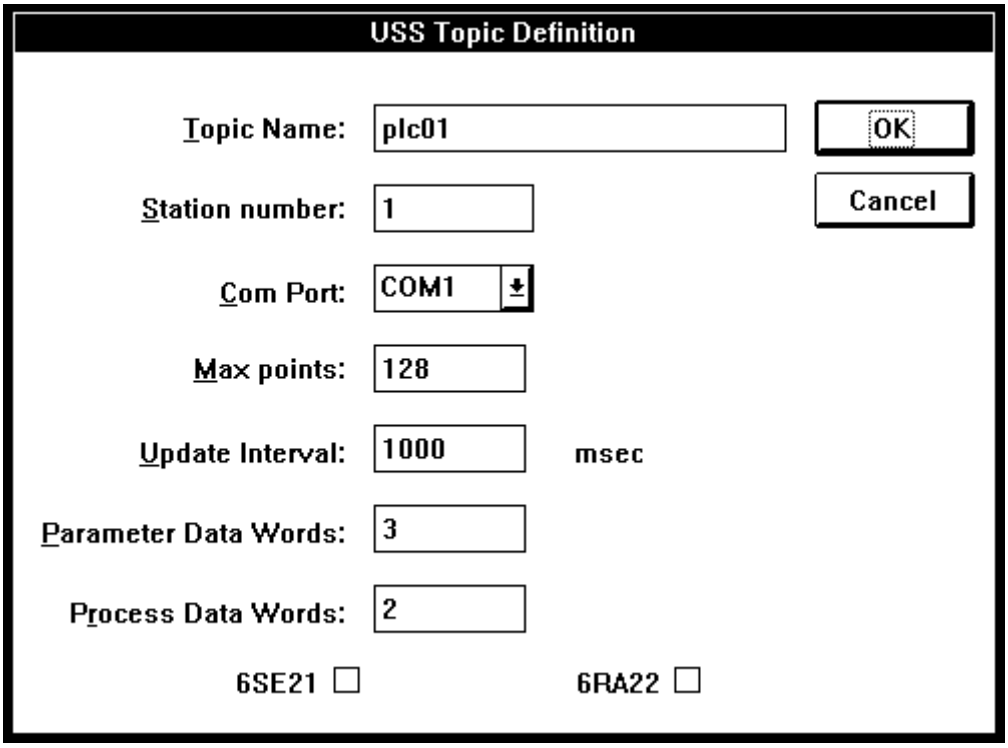
The user provides each connected converter with an arbitrary name that is used as the DDE topic for all references to this converter.

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

1. Invoke the *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**. To remove an existing topic, click on **Delete**. The "USS Topic Definition" dialog box will appear:



3. Enter the **Topic Name** that corresponds to the DDE Topic Name (The DDE Topic Name is entered in the "DDE Access Name Definition" dialog box described in the **Using the USS Server with InTouch** section).

4. Enter the **Station number** for this converter device.
   Note: *Each converter must have a unique address from 0 to 30. Station number 255 can be used as a broadcast address. If some data is sent to this address then all connected converters will receive these data. It is impossible to read data from topic with Station number 255.*

5. Click on the **Com Port** button to associate a topic with the communication port.
   Note: *Additional topics may be associated with the same communication port later.*

6. Set the **Max supported points** for topic (converter). (Set the number of really used (polled) items/points or little higher, not maximum allowed). Default value is 128.

7. Set the **Update Interval** field to indicate the frequency the items/points on this topic will be read (polled). Default value is 1000 milliseconds.

8. Set the number of **Parameter Data Words** in the Master (PC) to Slave (converter) message and in the response. Value less than 3 in this field means that there is no parameter data in the message. To configure topic for messages containing 3 Parameter Data Words enter value 3 in this field. Default value is 3.
   Note: *Value set in this field must correspond to hardware settings. For example, on the 6RA24 the corresponding value is set in parameters P782, P792.*

   *For converter type **6RA22** this option is not effective; in this case the Server operates with 10-word telegram.*

9. Set the number of **Process Data Words** in the Master (PC) to Slave (converter) message and in the response. Valid values in this field are from 0 to 15.
   Note: *Value set in this field must correspond to hardware settings. For example, on the 6RA24 parameters P781, P791 contain number of Process Data Words + the control word. If value of parameters P781, P791 is 3 then value 2 must be entered in the **Process Data Words** field.* Default value is 2.

   *For converter type **6RA22** this option is not effective; in this case the Server operates with 10-word telegram.*

   Note: *Value 3 in the **Parameter Data Words** field and value 2 in the **Process Data Words** field corresponds to simple protocol when each message contains 14 bytes. Such values must be set for Siemens converters (MicroMaster, 6SE21).*

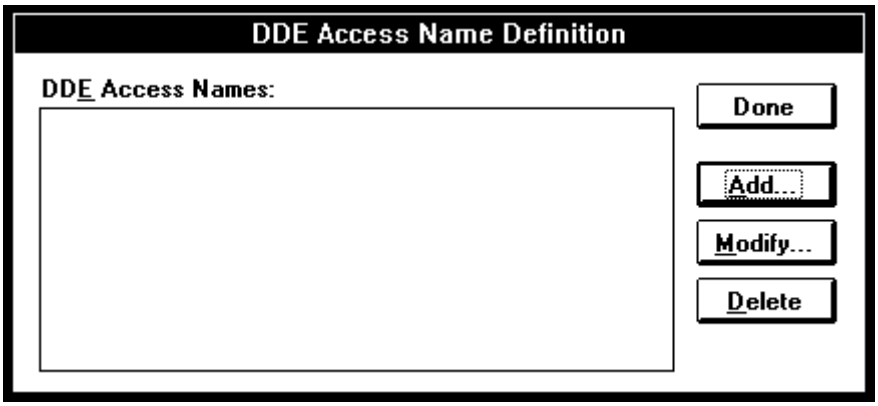
10. Check the **6SE21** checkbox if converter type is 6SE21; check the **6RA22** checkbox if converter type is 6RA22. In other cases do not check checkboxes.

11. When all entries have been made, click on **OK** to process the configuration for this topic.

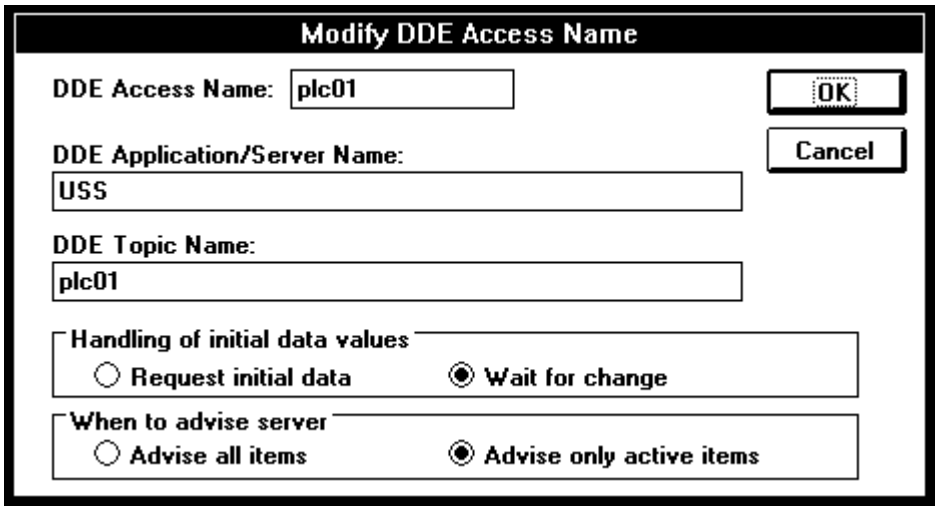
Using the USS Server with InTouch

To change process data words or to access items/points on converters from **InTouch**, the following steps (all performed in **WindowMaker**) are required:

To define the DDE Access Names in WindowMaker for each converter invoke the */Special/DDE Access Names...* command. The "DDE Access Name Definition" dialog box will appear.



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



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

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

DDE Access Name
Enter an arbitrary name that will be used by **InTouch** to refer to the topic (converter). It is recommended that the name defined for the topic (converter) in USS also is to be used here.

DDE Application/Server Name
Enter the application name, **USS**, which the DDE Server used accessing the converter.

DDE Topic Name
Enter the name defined for the topic in USS to identify the converter the USS Server will be accessing.

Note: *This will usually be the same as the "DDE 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 USS Server.***

Request Initial Data
This option may be selected if the Server is other than a Wonderware DDE Server **and** the Server does not return data values immediately when a window is displayed. This option is not applicable to the USS DDE Server.

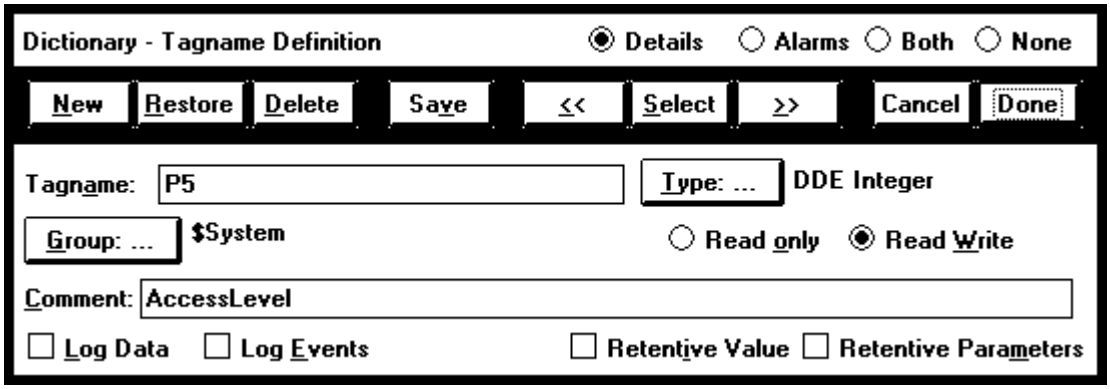
Wait for Change
This option should be selected for USS DDE Server.

Advise all Items
This option may be selected if the Server is to poll for all data whether or not it is in visible windows, alarmed, logged or trended. Use of the option is not recommended.

Advise only active Items
Selecting this option will cause the USS Server to poll only points in visible windows and points that are alarmed, logged or trended.

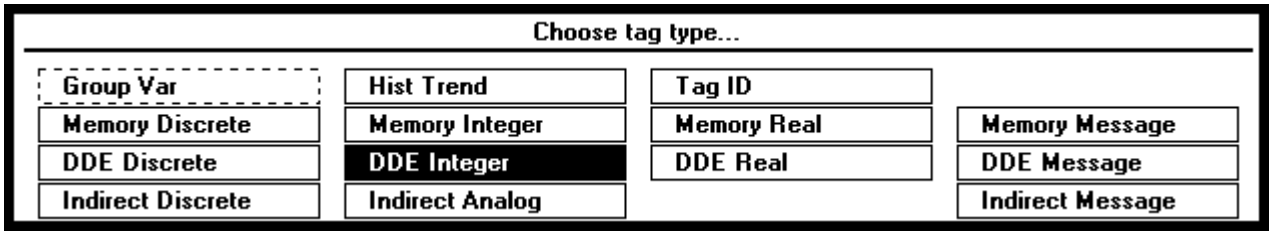
Defining the Tag names

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



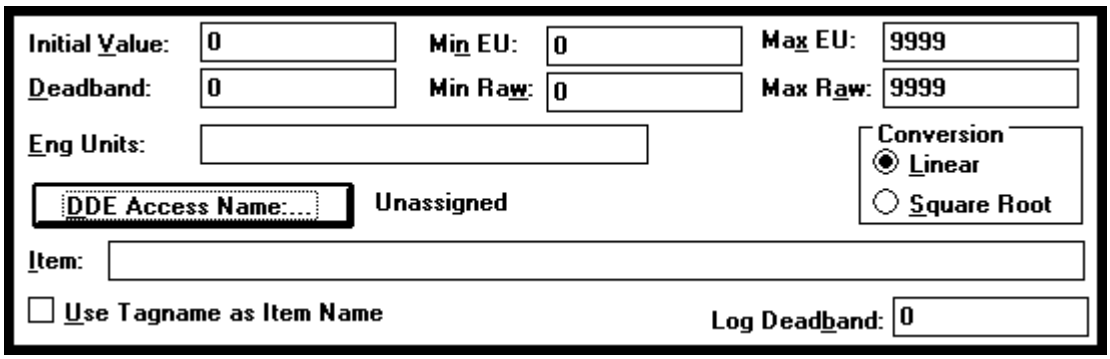
Click on **New** and enter the **Tag Name**. (The tag name defined here is the name **InTouch** will use. The USS Server does not see this name.)

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

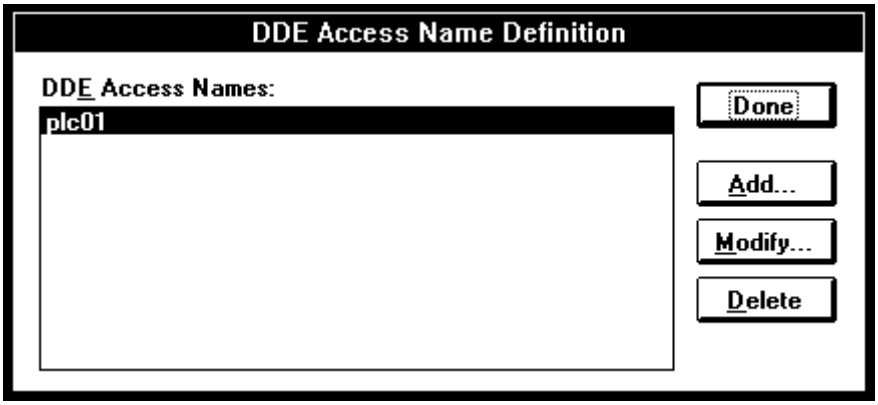


In order to access USS items, the type must be **DDE Discrete, DDE Integer** or **DDE Real.** Select the DDE type.

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

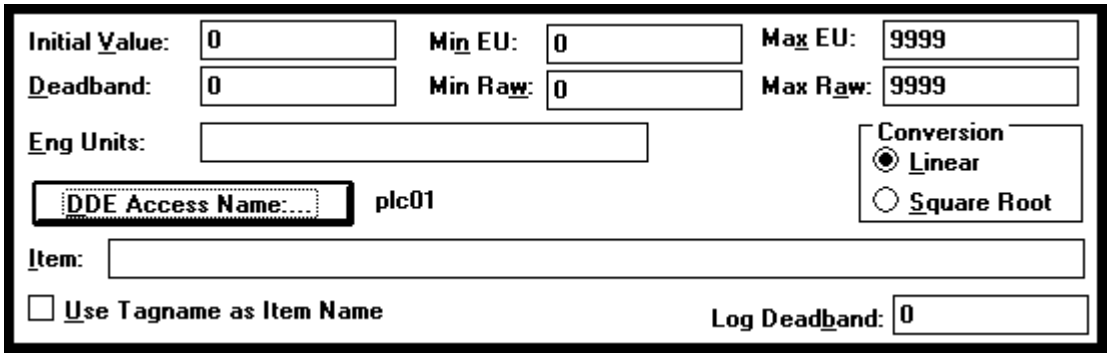


Select the USS topic (converter) by clicking on the **DDE Access Name**... button. The "DDE Access Name Definition" dialog box will appear:



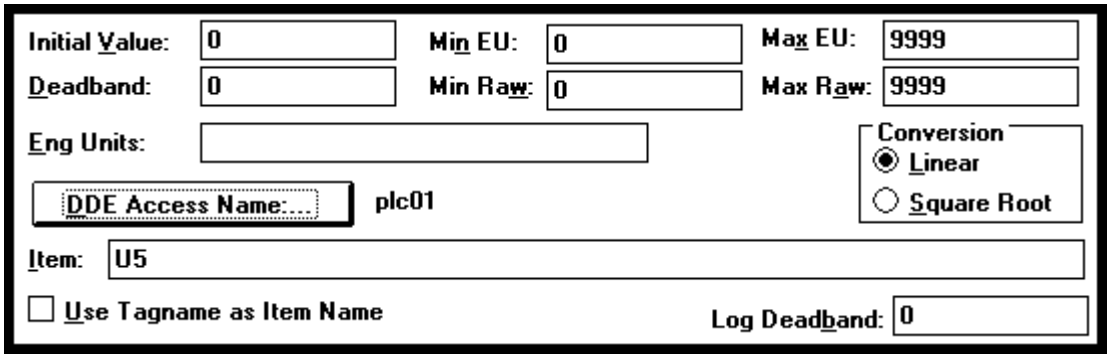
Select the appropriate topic name and click on **Done**. (If the DDE Access Name has not been defined as previously described, click on **Add** and define the DDE topic now.)

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



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

Enter the USS item/point name to be associated with this tag name in the **Item** field in the "Details" box:



(Refer to the **Item (Point) Naming** and **Item (Point) Naming for 6RA22** section below for complete details.)

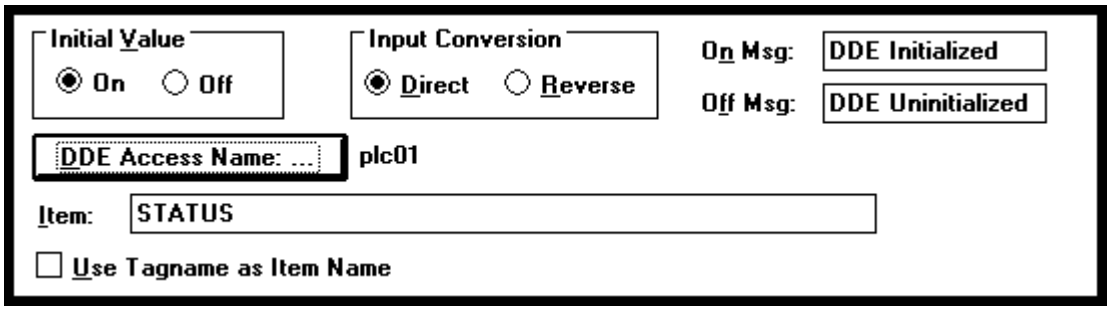
Where applicable, the **Use Tag name as Item Name** option may be selected to automatically enter the tag name in this field. ***Note:*** *The tag name can only be used if it follows the conventions listed in the* ***Item (Point) Naming*** and ***Item (Point) Naming for 6RA22*** *section.*

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

Converter "STATUS" Item

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

From **InTouch** the state of communications with the Converter may be read by defining a DDE Discrete tagname and associating it with the topic configured for the Converter and using **Status** as the *Item* name.



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

=USS|topic!STATUS

Item (Point) Naming

This chapter deals with Item (Point) naming for communication with all types of converters **except** 6RA22.

The USS Server can access up to 1023 Parameter Words from the Converter internal memory. The Server supports additional items representing Process Data Words and bits of these words, which allows user to check the contents of messages and to control the data exchanging between Server and Converter, as well as to control the Converter performance.

Parameter Items

The Items representing **Parameter Words** are used to access the Converter internal parameters. Item/point names representing Parameter Words generally may be described as:

PnImE

Where **P** - prefix which identifies the type of Item. The following characters can be used: D(d) - Discrete Item; I(i) - signed Integer Item; U(u) - unsigned Integer Item; F(f) - Float Item (Item with value adjusted in 0.1 steps); R(r) - Float Item (Item with value adjusted in 0.01 steps).

n - specifies the Parameter number. Do not use Parameter numbers unsupported on your Converter.

I - optionally used suffix (I or i), indicating that Item value is accessible by *Indexed* parameter value request or *Indexed* parameter value change message.

m - Index for Parameter Number. Value **m** will be set in the PKW Word 2 of message. Index **m** is used only with suffix I (i).

E - optionally used suffix (E or e), indicating that Item value must be changed both in RAM and EEPROM.

If two suffixes "**E**" ("**e**") and "**I**" ("**i**") are used simultaneously then Indexed parameter value must be changed both in RAM and EEPROM.

Set the item type according to your hardware (see Converter manual). For example, the MicroMaster parameter P015 has only two possible values (0 and 1) and item type can be Integer or Discrete. Valid item names are: D15, I15 and U15.

The MicroMaster parameter P016 has three possible values. In this case item type must be Integer and valid item names are: I16 and U16.

The MicroMaster parameter P012 values may be set between 0.0 and 650.0 Hertz, i.e. parameter value is adjusted in 0.1 steps. In this case the data format is scaled to 0.1 and item name F12 is useful. If poke F12 then the Server takes the Float value of F12, converts it to 16 bit Short Integer scaled in 0.1 steps and puts it into VAL field of send telegram. For example, if poked F12 value is 30.1 then the VAL field in telegram will contain 301.
So, to poke value 30.1 into parameter P012 the following Item names with corresponding values can be used:
Item F12 with value 30.1,
Item R12 with value 3.01,
Item I12 with value 301,

Item U12 with value 301. In all these cases the same telegram will be transferred to the drive.

Items representing Parameter Words (**PnImE**) usually are *Read/Write* type. The server does not check whether Item value can be changed in the Converter. See Converter manual before try to write new value into Converter memory.

Process Data Words Items

The USS Server supports a list of Items that allow to control the contents of messages sent to the controlled Converter and to check the response received from Converter. Item names mainly depend on Siemens USS protocol (for MicroMaster, 6SE21) message fields naming as well as on this protocol extension for 6RA24 converters.

The number of Process Data Words in message depends on Converter and protocol type and can be configured during topic configuration. The default values (after server start-up) for items representing Process Data Words (and Bits of Process Data Words) are zeroes (0). When the Server is restarted the Process Data Words have default values (zeroes) again.

To perform the Converter control by items representing Process Data Words or Bits of Process Data Words the corresponding Items must be activated in user application and necessary values must be assigned to them. For example, to allow the MicroMaster to run, the user application must set an Item STW value to 3199. If any Process Data Words Item value is changed the Server sends message with changed Process Data Word value. All next messages sent by the Server will contain the changed Process Data Word value until the user application changes the Process Data Word value again. To recognise the right sequence for changing of Process Data Word values see your hardware manual.

The table below lists the Item/point names representing **Process Data Words** and bits of these words.

Item name	Type	DDE Tag Type	Value Range	n Range	Default Value
STW	Word	Integer	0...65535		0*
STW.n	Bit	Discrete	0,1	0 to 15	
HSW	Word	Signed Integer	-16384...16384		0
UHSW	Word	Integer	0...65535		0
ZSW	Word	Integer	0...8191		0
ZSW.n	Bit	Discrete	0,1	0 to 15	0
HIW	Word	Signed Integer	-16384...16384		0
UHIW	Word	Integer	0...65535		0
FHIW	Word	Real	0...65535		0
PKE_CONTROL	Word	Integer	0...15		
ERROR_COD	Word	Integer	0...255		
PZDSn	Word	Signed Integer	-32768...32767	2 to 15	0
UPZDSn	Word	Integer	0...65535	2 to 15	0
PZDRn	Word	Signed Integer	-32768...32767	2 to 15	0
UPZDRn	Word	Integer	0...65535	2 to 15	0

(*) For Server versions from v1.0 to v1.3 the default value of STW is 3191. In Server version 1.4 and later the default value is 0 (zero).

Notes:
1. The item **STW** represents first Process Data Word in the send message. Items **STW.0**...**STW.15** represent bits of the first Process Data Word (STW). For 6RA24 the item STW is used instead of PZD0 Word. Each bit in STW Word has a predefined meaning, which depends on Converter and protocol type.

2. The item **HSW** is second Process Data Word in the send message and represents the frequency demand. For 6RA24 the item HSW is used instead of PZD1 Word. For MicroMaster the values 0...32767 represent 0...200%, values 32768...65535 represent reversed 0...200%. For 6SE21 the negative demand is not supported and frequency demand above 100% is clipped to 100%. If only positive frequency demand values are supported then the item **UHSW** can be used. For 6RA24 the frequency demand to the converter is scaled as follows: the value 16384 represents 100%, value -16384 represents -100% (i.e. reverse), therefore an Item HSW must be used.

3. The item **ZSW** represents first Process Data Word in the response message. Items **ZSW.0**...**ZSW.15** represent bits of the first Process Data Word ZSW. For 6RA24 the item ZSW is used instead of PZD0 Word.

4. The item **HIW** is the second Process Data Word in the response message and represents the output frequency of the Converter. For 6RA24 the item HIW is used instead of PZD1 Word. The item value is formatted in same way as for the HSW field. For MicroMaster, 6SE21 and other converters supporting only positive HIW values the item **UHIW** can be used. The 6SE21 returns the current value scaled to 0.1 Amps in HIW field if the STW field bit 15 was set to 1. In this case the item **FHIW** must be used.

5. The item **PKE_CONTROL** value is extracted from the response message's PKE word (control bits with addresses 12, 13, 14 and 15). The possible values are: 0 - no action, 1 - parameter value is in the response VAL field, 4 - indexed parameter value transferred, 7 - error in the received command, 8 - the Converter is in Local Control (parameter change request not possible).

6. If the PKE_CONTROL value is 7 then the item **ERROR_COD** value contains the error code. The possible error codes are: 0 - Illegal Parameter Number, 1 - Read Only Parameter (not supported on 6SE21), 2 - the parameter value requested in PKW word 3 is beyond the minimum or maximum limits of acceptable values, 3 - the index sent in PKW word 2 is undefined, 11 - the request code sent in PKW word 1 is not implemented, 101 - the request code function sent in PKW word 1 is not implemented, 102 - the parameter is an indexed parameter. If no errors, ERROR_COD value is 255.

7. The items **PZDS2**...**PZDS15** represent Process Data Words in the send message in case of 6RA24 converters. The items STW and HSW are used instead of PZDS0 and PZDS1. The values of items PZDS2... PZDS15 are interpreted as signed Integers. If values must be interpreted as unsigned integers the items **UPZDS2**...**UPZDS15** can be used.

8. The items **PZDR2**...**PZDR15** represent Process Data Words in the response message in case of 6RA24 converters. The items ZSW and HIW are used instead of PZDR0 and PZDR1. The values of items PZDR2... PZDR15 are interpreted as signed Integers. If values must be interpreted as unsigned integers the items **UPZDR2**...**UPZDR15** can be used.

Important: *In USS DDE Server version 1.4 and later the default values of all Process Data Words after Server startup are zeroes (0).*
The Server does not perform any communication while Process Data Word STW is default (zero). It allows the user application to set the necessary values into all Process Data Words before sending the first request to the equipment. Otherwise the Server can send to drive a command with incorrect Process Data Words and so interrupt good performance of equipment.
While STW is zero the Server does not create any write command, it is, the Server does not react to pokes of Parameter data words at all.
To make the Server to communicate the following should be done:
- Poke correct values into Process Data Words (except STW). For example, in case of MicroMaster drive, firstly poke value of HSW (e.g. 16384),
- poke into STW correct non-zero value, for example, value 3199 (in case of MicroMaster).

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

The items **STW**, **STW.n**, **HSW**, **UHSW**, **UPZDSn** and **PZDSn** are *Write Only*.
The items **ZSW**, **ZSW.n**, **HIW**, **UHIW**, **FHIW, PKE_CONTROL**, **ERROR_COD**, **PZDRn** and **UPZDRn** are *Read Only*.

Item/Point Naming Examples

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

I33	converter parameter number 33, interpreted as Integer.
U12E	converter parameter number 12, change in RAM and EEPROM, interpreted as unsigned Integer.
f51i2E	converter parameter number 51, indexed parameter change in RAM and EEPROM, index value 2, interpreted as Float.
i78i1	converter parameter 78, indexed parameter, index value 2, interpreted as Integer.
PZDS3	the third PZD Control Word for 6RA24 in send message.
STW.4	Bit number 4 in the STW Control Word.

Item (Point) Naming for 6RA22

This chapter deals with Item (Point) naming for communication with **6RA22** type converter.

The USS Server can access up to 390 Parameter Words from the 6RA22 Converter internal memory. The Server supports additional items representing Telegram Data Words, which allows user to check the contents of messages and to control the data exchanging between Server and Converter, as well as to control the Converter performance.

Parameter Items

The Items representing **Parameter Words** are used to access the Converter internal parameters. Item/point names representing Parameters generally may be described as:

PNn

Where **P** - prefix that identifies the type of Item. The following characters can be used: B(b) - Discrete Item; I(i) - signed Integer Item; U(u) - unsigned Integer Item (value 0...65535); F(f) - Float Item (Item with value adjusted in 0.1 steps); R(r) - Float Item (Item with value adjusted in 0.01 steps).
N - prefix that identifies the Parameter name. The following characters can be used:
P(p) - specifies the Parameters P00 to P177; **n** values 0...177 correspond to parameter numbers 00 to 177.
d(D) - specifies the Parameters d00 to d30; **n** values 0...30 correspond to parameter numbers 200 to 230.
H(h) - specifies the Parameters H00 to H89; **n** values 0...89 correspond to parameter numbers 300 to 389.
n - specifies the Parameter number. Do not use Parameter numbers unsupported on your Converter.

If the Server does not accept Item name without prefix that identifies the type of Item (is it Discrete or Integer or other type), then the error message in WWLogger file “Invalid item/point name: …” appears. In this case Item name should be modified so that type of Item is set in Item name by prefix. Define the item type according to your hardware (see Converter manual). For example, the parameter described in Converter manual as E73 has possible values 0...15 and item type can be integer or unsigned integer. Valid item names are: IP173, and UP173.

Float items are useful if parameter value is adjusted in 0.1 or 0.01 steps. In this case item names with prefix F(f) or R(r) are useful. If poke some value into such Float item then the Server takes the Float value, converts it to 16 bit Short Integer scaled in 0.1 or 0.01 steps and puts it into value field of send telegram. For example, if poked value of item with prefix F(f) is 30.1 then the value field in telegram will contain 301.
So, to poke value 30.1 the following Item names with corresponding values can be used:
Item name with prefix F(f) with value 30.1,
Item name with prefix R(r) with value 3.01,
Item name with prefix I(i) with value 301,
Item name with prefix U(u) with value 301. In all these cases the same telegram will be transferred to the drive.

Items representing Parameter Words (**Pn**) usually are *Read/Write* type. The server does not check whether Item value can be changed in the Converter. See Converter manual before try to write new value into Converter memory.

Additional DDE Discrete Items **P1022** and **P1023** are supported by the USS DDE Server in *broadcast* mode (for Topic number 255).
When value of P1022 is changed by application from 0 to 1, the Server sends a broadcast message where only the control commands of word E3 are processed by the converter.
When value of P1023 is changed by application from 0 to 1, the Server sends a broadcast message where only the control commands of word E3 and the setpoint of word E2 are processed by the converter.

Telegram Data Words Items

A 10-word telegram is used for communication with 6RA22 Converter. The USS Server supports a list of Items that allows to control the contents of messages sent to the 6RA22 Converter and to check the response received from Converter.

The default values for items representing Telegram Data Words in Host to Drive telegram are zeroes (0). To change the default values - add the following WIN.INI file Items 6RA22_E2, 6RA22_E3, 6RA22_E5, 6RA22_E6, 6RA22_E7, 6RA22_E8, 6RA22_E9 and 6RA22_E10 with necessary default values into WIN.INI file (see chapter *Troubleshooting*). The default values are set into the send messages after the Server startup. To change contents of message during Server performance an application must assign correct values to E2, E3, E5, E6, E7, E8, E9, E10 Items.
Important:
Set correct values to 6RA22_E2, 6RA22_E3, 6RA22_E5, 6RA22_E6, 6RA22_E7, 6RA22_E8, 6RA22_E9 and 6RA22_E10 in WIN.INI file before Server start-up. Otherwise the Server can send to drive a command with incorrect Telegram Data Words and so interrupt good performance of equipment.

If any Telegram Data Words value is changed the Server sends message with changed Telegram Data Word value. All next messages sent by the Server will contain the changed Telegram Data Word value until the user application changes the Telegram Data Word value again.

The table below lists the Item/point names representing **Telegram Data Words**.

Item name	Type	DDE Tag Type	Value Range*	n Range	Default Value
En	Word	Signed Integer	-32768...32767	2...10	0
Uen	Word	Unsigned Integer	0...65535	2...10	0
Sn	Word	Signed Integer	-32768...32767	1...10	0
Usn	Word	Unsigned Integer	0...65535	1...10	0

(*) Values of Speed Reference Items are limited to -16384 ... 16384 or 0 ... 16384.

Notes:
1. The items En represent Telegram Data Words in the send message. Value of En is interpreted by the Server as signed integer. If values must be interpreted as unsigned integers the items UEn can be used.
Value of E1 is generated by the Server and is not accessible by application.
Value of word E4 (UE4) is set by the Server, when operates not in a broadcast mode: for read messages - 0, for write messages - value to be placed in the parameter identified in word E1. When in a broadcast mode this word value is set by application and contains a bit mask to allow selective operation of the control bits in word E3.
All other Telegram Data Word values can be changed by an application (Write only type).

2. The items Sn represent Telegram Data Words in the response message. Value of Sn is interpreted by the Server as signed integer. If values must be interpreted as unsigned integers the items USn can be used.
All Item (S1...S10) values are accessible by application, but can not be changed by application (Read only type). Parameter value (S4) is extracted by the Server and given to application as correspondent parameter Pn value.

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

Item/Point Naming Examples

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

id9	converter parameter number 209, interpreted as signed Integer.
Ud10	converter parameter number 210, interpreted as unsigned Integer.
E3	Telegram Data Word number 3 in send message interpreted as signed Integer.
S10	Telegram Data Word number 10 in response message interpreted as signed Integer.
US3	Telegram Data Word number 3 in response message interpreted as unsigned Integer.

Notes on Using Microsoft Excel

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

=USS|topic!item

Sometimes, Excel requires the topic and/or item/points 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/point names described in the **Item (Point) Naming** or **Item (Point) Naming for 6RA22** section.

Reading Values into Excel Spreadsheets

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

=USS|plc01!U33i4E
=USS|pc!PZDR6
=USS|converter1!HIW

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

=USS|topic!STATUS

Writing Values to USS Points

Values may be written to USS 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("USS","topicname")
=POKE(channel,"itemname", Data_Reference)
=TERMINATE (channel)
=RETURN()

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

channel=INITIATE("USS","topicname")
Opens a channel to a specific topic name (defined in the Server) in an application with name USS (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 parameter on the drive) via the **channel** number returned by the previously executed **INITIATE** function. **Data_Reference** is the row/column ID of the cell containing the data value. For **"itemname"**, use some of the valid item names described in the ***Item (Point) Naming*** 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 **unit1** item **U33i4E**:

```
PokeMacro -Ctrl a
=INITIATE("USS","unit1")
=POKE(A2,"U33i4E",B2)
=ON.TIME(NOW()+0.01,"TerminateDDEChannel")
=RETURN()

TerminateDDEChannel
=TERMINATE(A2)
=RETURN()
```

***Note: R**efer 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 USS Server configuration, most of the items in the following list will automatically appear in the WIN.INI file. It is usually in the C:\WINDOWS directory. It is an ASCII file and can be altered manually if you wish with any text editor, e.g. MS Windows Notepad (*do not use a program that formats text, such as MS Word or Write unless the file is saved as DOS text*). The following is a typical entry for the USS Server:

[USS]
ProtocolTimer=50
RequestTimer=1000
ValidDataTimeout=60000
DDEBlockSize=4096
WriteRetryIndefinitely=0
ConfigurationFile=C:\USS
WinIconic=0
WinFullScreen=0
WinTop=112
WinLeft=0
WinWidth=200
WinHeight=168
ShowSend=0
ShowReceive=0
ShowErrors=1

For **6RA22** device the following Items can be added to change the default values for communication telegram words E2, E3, E5, E6, E7, E8, E9 and E10:
6RA22_E2=0
6RA22_E3=0
6RA22_E5=0
6RA22_E6=0
6RA22_E7=0
6RA22_E8=0
6RA22_E9=0
6RA22_E10=0

Set values you need instead of zeroes.

Troubleshooting menu

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

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

Show Send - if checked then all outgoing data is displayed in hexadecimal format.
Show Receive - if checked then all incoming data is displayed in hexadecimal format.
Show Errors - if checked then all information about errors is displayed.
Dump - displays all information about opened ports, active topics and data items.

All debug is displayed via the Wonderware Logger, which must be active for these commands to work.

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

KLINKMANN AUTOMATION
USS DDE Server
Revision History

Aug 95	Rev 1.0	First Release
Jan 96	Rev 1.1	Changed Default Values of Process Data Words
Jan 96	Rev 1.2	Added Access to 6RA22 Converter
Oct 96	Rev 1.3	Modification of manual contents Chapters: Files on the USS Distribution Disks Installing the USS DDE Server
Sep 97	Rev 1.4	Manual file name changed. Minor changes.
Jan 2001	Rev 1.5	Corrected Item/Point naming for 6RA22 Converter.
Mar 2001	Rev 1.6	Corrected Item/Point naming.
Mar 2002	Rev 1.7	Installation from CD information added.