

ENGEL DDE Server

for Microsoft Windows
and InTouch Applications

**User Manual
Ver 1.x Rev 1.1
DR 200 10**

KLINKMANN AUTOMATION
P.O. Box 38
FIN-00371 Helsinki Finland
tel. int. + 358 9 5404940
fax int. + 358 9 5413541
www.klinkmann.com

Table Of Contents

What is DDE?.....	1
Accessing a Remote DDE Item from ENGEL DDE Server.....	2
Installing the ENGEL DDE Server	2
Configuring the ENGEL DDE Server	3
DDE Server Settings Command	3
Com Port Settings Command	5
Saving ENGEL DDE Configuration File	6
Configuration File Location	6
Configure Topic Command.....	7
Item (Point) Naming.....	9
Using the ENGEL DDE Server with InTouch.....	10
Defining the DDE Access names.....	10
Defining the Tag names.....	12
Accessing the "STATUS" Item.....	14
Notes on Using Microsoft Excel.....	14
Reading Values into Excel Spreadsheets	14
Writing Values to ENGEL Points.....	15
Troubleshooting.....	16
WIN.INI entries	16
Troubleshooting menu	16

ENGEL DDE Server

The **ENGEL DDE Server** is a Microsoft Windows application program that acts as a DDE (Dynamic Data Exchange) *Server* and allows other Windows application programs to communicate with Machine Control Systems CC80-A05, CC80-A06, EC88-A01, EC88-A02, CC90-A01 and CC90-A02 (hereafter referred to as the Control Unit) through the serial interface. The run-time system consists of one IBM PC or compatible (host processor) connected to Control Unit (slave processor).

The *Server* is primarily intended for use with **Wonderware InTouch**, but it may be used by any Microsoft Windows (NT, 2000, XP or 95 (98)) 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 *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 *Topic Name* defined in WindowMaker "DDE Access Name Definition" section and the item name is the *DDE Item name* specified for some tag included 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 ENGEL DDE Server

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 ENGEL DDE Server the application portion of the DDE address is **ENGEL**.

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

Item indicates a specific data element within the specified topic. For the ENGEL DDE Server, an item is an individual point in the Control Unit. (The item/point names are described in the **Item (Point) Naming** section.)

Note: In some cases, the term "point" is used interchangeably with the term "item".

Installing the ENGEL DDE Server

The ENGEL DDE Server installation package can be supplied:

1. As a self-extracting archive 20010xxx.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 ENGEL DDE Server from the self-extracting archive, run the 20010xxx.EXE and proceed as directed by the ENGEL DDE Server Setup program.

To **install** the ENGEL DDE Server from CD or distribution disks (floppies), on MS Windows (NT, 2000, XP or 95 (98)):

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

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

ENGEL.EXE The ENGEL Server Program. This is a Microsoft Windows 32-bit

	application program.
ENGEL.HLP	The ENGEL Server Help file.
ENGEL.CFG	An example configuration file.
LICENSE.TXT	Klinkmann Automation software license file.
WWCOMDLG.DLL	Dynamic Link Library necessary for ENGEL Server.

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

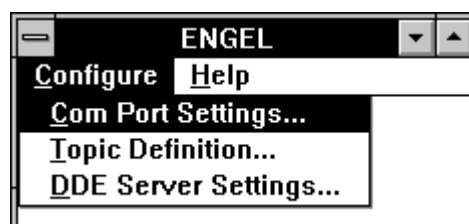
Note:

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

Configuring the ENGEL DDE Server

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

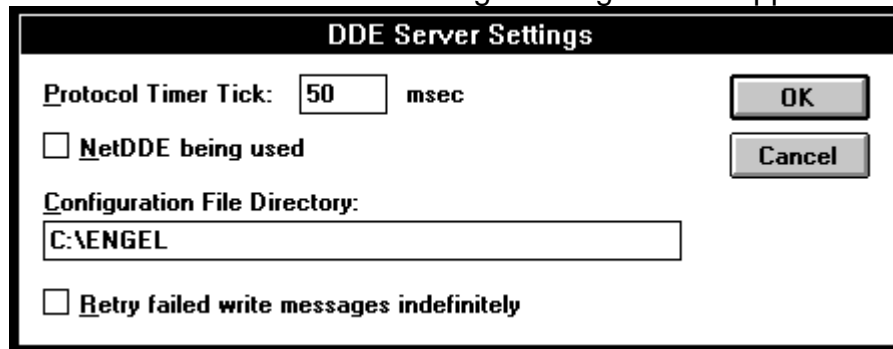
To perform the required configurations, start the ENGEL DDE program. If the Server starts up as an icon then double-click on the icon to open the server's window. To access the commands used for various configurations open the */Configure* menu:



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 `/Configure/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 is continuously activated (the Server checks for work to perform). This should be approximately 2 to 4 times faster than the rate desired to update data from Control Units units. For Windows 3.x if computer is very busy or some other 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. This is the minimum value for Windows 3.x. If the value lower than 50 is entered, the Server uses 50 milliseconds.

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 ENGEL DDE Server will save its current configuration file. ENGEL DDE Server will use this path to load the configuration file the next time it is started.

Retry failed write messages indefinitely

If this option selected ENGEL DDE Server will retry failed write messages indefinitely.

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

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

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

Com Port Settings Command

This command is used to configure the communication port that will be used to communicate with Control Units. Invoke the `/Configure/Com Port Settings...` command. The "Communication Port Settings" dialog box will appear:

The following describes each field in this dialog box:

Com Port.

This field is used to select communication port to change or view the settings.

Reply Time-out.

This field is used to enter the amount of time (in seconds), all Control Units 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 settings used in all connected Control Units.

Note: The default Baud Rate is 9600.

Data Bits.

The selected Data Bits must match the settings used in all connected Control Units.

Note: The default is 8.

Stop Bits.

The selected Stop Bits must match the settings used in all connected Control Units.

Note: The default is 1.

Parity.

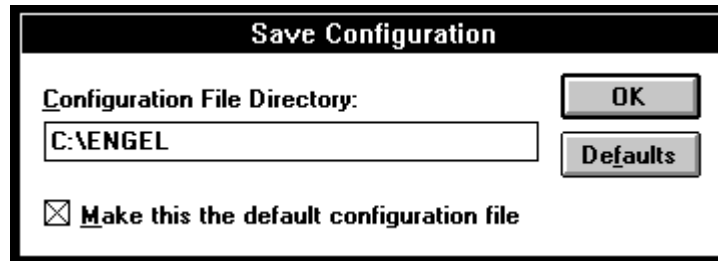
The selected Parity must match the settings used in all connected Control Units.

Note: The default is None.

When all entries have been made, click on **Done** to process the configuration for the communication port. To reset to the default values, click on **Defaults**.

Saving ENGEL DDE 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. If necessary path may be changed. Also, the path can optionally be recorded in the **WIN.INI** file by selecting the "**Make this the default configuration**" option. Doing so it will allow the ENGEL DDE Server to find the configuration file automatically each time it is started.

Configuration File Location

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

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

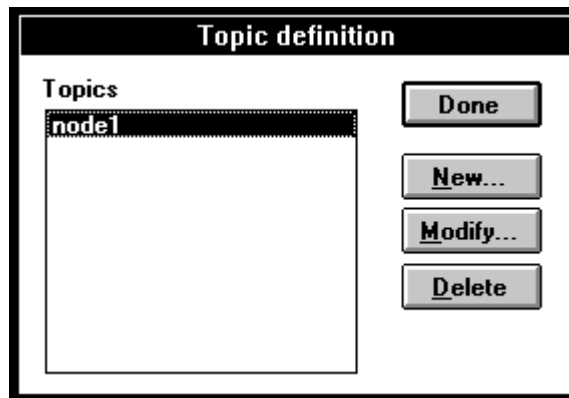
ENGEL /d:c:\directoryname

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

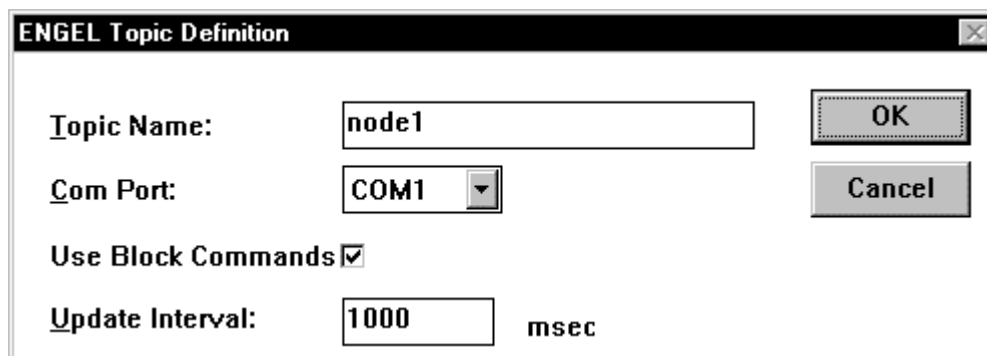
Configure Topic Command

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

To define the Topics (Control Units) connected invoke the */Configure/Topic Definition...* command. The "Topic Definition" dialog box will appear:



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



The following describes each dialog field in this dialog box:

Topic Name

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

Com Port

Select the **Com Port** to associate it with the topic. Additional topics may be associated with the same Com Port later.

Use Block Commands

Enter the type of communication used to request data from Control Units. If this checkbox is checked then group/block commands are used to request parameters; in this case Engel DDE Server can request up to 25 parameters in one command; this is a

recommended choice. If this checkbox is not checked then only one parameter is requested in one command; in this case the performance of communication is very low and could be used only if accessed Control Unit does not support group/block commands.

Note: *The default choice is "block commands used".*

Update Interval

Set the **Update Interval** field to indicate the frequency the items/points on this topic will be read (polled).

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

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

Item (Point) Naming

The DDE item names used in the ENGEL DDE Server generally may be described as:

GGMMs

where

GG - Group number, value can be 00 ... 99

MM - Member number, value can be 00 ... 99

s - Optional suffix specifying type of DDE item. Possible values can be:

none or **"I"** or **"i"** - DDE Integer, value range: -2147483648 ... +2147483647

"D" or **"d"** - DDE Discrete, values: 0 , 1

"R" or **"r"** - DDE Real, value range: -1e-37 ... 1e37

"S" or **"s"** - DDE Message, maximal length 200 bytes (InTouch supports only 131 bytes), can contain any characters except NULL (code 0x00) and GS (code 0x1D).

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

Item/Point Naming Examples

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

9000, 9900, 1903I, 1926i	Integers
9900	Discrete
1910R, 1943r	Reals
9009S, 9014s	Strings

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

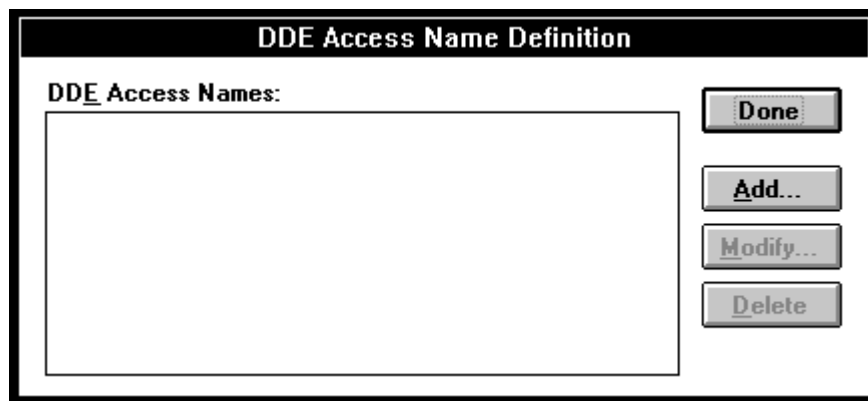
0, 12i, 888, 888S, 9r, 243R	Too few digits for Group number and Member number
00000, 13342i, 05549r, 11124D	Too much digits for Group number and Member number
0000U, 1234L, 0205p	Invalid suffix (item type)

Using the ENGEL DDE Server with InTouch

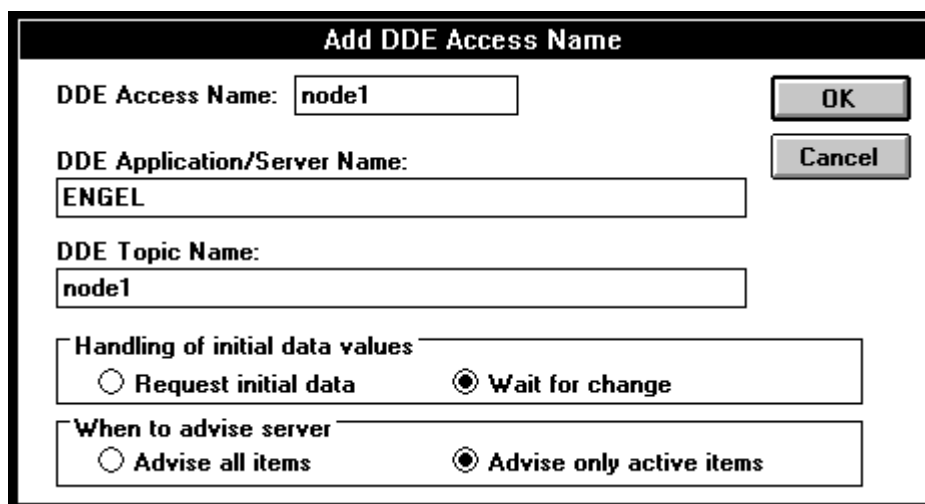
To access to items/points on the Control Units from **InTouch**, the DDE Access names and Tag names should be defined in **WindowMaker**.

Defining the DDE Access names

To define the DDE Access Names in WindowMaker for Control Unit invoke the `/Special/DDE Access Names...` command. The "DDE Access Name Definition" dialog box will appear.



Click on **Add**. The "Add DDE Access Name" dialog box will appear:



Note: This dialog box will be blank when it initially appears. Data has been entered here to illustrate the entries which are made.

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

DDE Access Name

Enter an arbitrary name which will be used in **InTouch** tag name definitions to refer to the topic (Control Unit). For simplicity, it is recommended that the name defined for the topic in ENGEL DDE Server also should be used here.

DDE Application/Server Name

Enter the application name, **ENGEL**, which is the DDE Server to be used to access the Control Units.

DDE Topic Name

Enter the name defined for the topic in ENGEL DDE Server to identify the Control Unit that will be accessed by the DDE Server. This will usually be the same as the "DDE Access Name", but if desired they may be different. However, the **DDE Topic Name** must be the same name used when the *Topic* was configured in the ENGEL DDE 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 ENGEL DDE Server.

Wait for Change

This option should be selected when the DDE application is the ENGEL DDE Server.

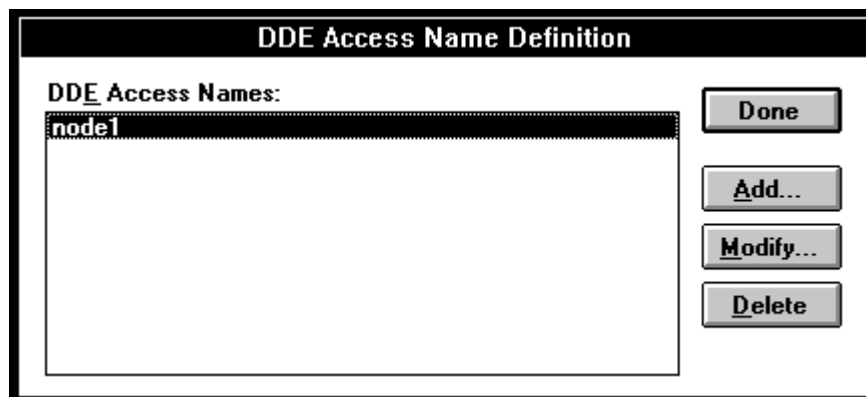
Advise all Items

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. The use of this option is not recommended.

Advise only active Items

Selecting this option will cause the ENGEL DDE Server to poll only points in visible windows and points that are alarmed, logged or trended.

When all entries have been made, click on **OK** to return to the "DDE Access Name Definition" dialog box:



Click on **Done** to accept added DDE Access name.

Defining the Tag names

To define the Tag names associated with the new "DDE Access Name", invoke the */Special/Tag Name Dictionary* command (in **WindowMaker**). The "Dictionary - Tag Name 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 ENGEL DDE Server does not see this name.)

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

To access ENGEL DDE items, the type must be **DDE Discrete** or **DDE Integer**. Select the DDE type.

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

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

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

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

When 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**.

Accessing the "STATUS" Item

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

From **InTouch** the state of communication with the Control Unit may be read by defining a DDE Discrete tag name and associating it with the topic configured for the Control Unit and using **STATUS** as the *Item* name.

The screenshot shows a configuration dialog box with the following fields and options:

- Initial Value:** Radio buttons for **On** (selected) and **Off**.
- Input Conversion:** Radio buttons for **Direct** (selected) and **Reverse**.
- On Msg:** An empty text input field.
- Off Msg:** An empty text input field.
- DDE Access Name:** A dropdown menu showing **Unassigned**.
- Item:** A text input field containing **STATUS**.
- Use Tagname as Item Name:** A checked checkbox.

Notes on Using Microsoft Excel

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

=ENGEL|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 (Point) Naming* 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:

```
=ENGEL|node1!1903i
=ENGEL|EC88!0002R
=ENGEL|CC90A2!0731
```

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

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

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

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

Opens a channel to a specific topic name (defined in the Server) in an application with name ENGEL (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 ENGEL DDE Server item name 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 **EC88** item **1903i**:

```
PokeMacro -Ctrl a
=INITIATE("ENGEL","EC88")
=POKE(A2,"1903i",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 ENGEL DDE 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. Windows Notepad (*do not use a program that formats text, such as Word or Write unless the file is saved as DOS text*). The following is a typical entry for the ENGEL DDE Server:

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

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 means that you can suspend access to the Control Units.

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

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

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

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

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

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

KLINKMANN AUTOMATION
ENGEL DDE Server
Revision History

Dec 97	Rev 1.0	First Release
Mar 2002	Rev 1.1	Installation from CD information added.