Connecting UniOP to Siemens Drives

This Technical Note contains the information needed to connect UniOP to Siemens drives using the USS communication protocol.

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1. Introduction

UPLC139.DLL is the file containing the driver for Siemens USS protocol. Siemens drives are configured by connections to function blocks. Connectors can be dword values, word values and bit values. Configuration of the protocol by parameters is also necessary for proper operation with UniOP.

2. Setting up the Drive for Communication

To configure the drive for communication with UniOP a number of parameters must be programmed, as described in this chapter. You will need to run Simovis software, select the correct drive model and connect to the drive. Parameters are identified as Pnnn. Some parameters can also have an index and are identified as Pnnn.n. Connections to parameters / functions are identified as K for 16 bit, KK as 32 bit and B for 1 bit. For more information refer to the Siemens CD for documentation and block diagrams.

The following drive parameters need to be set in the order shown. (Master drives VC(CUVC))

Note: the Simovis software will only show the first two words as active, it was not developed for 8 PZD word control.

P53=111111
P50=English

Settings shown for serial port 1 on the front of the drive.
P701.1=9600 baud to start with
P702.1=127 PKW words

P703.1=8 PZD words

Parameters needed by UniOP to read back bit pattern of words 5 and 6.
P44=K2005
P46=K2006

Words transmitted from the drive to UniOP, minimum.
P707.1=K32 status word 1
P707.2=KK151 Speed actual double word (SW)
P707.3=KK151 Speed actual (DW)
P707.4=K33 status word 2

Command bits from UniOP to the drive, minimum.
P554=B2100 Start/Stop
P555=B2101 E-Stop
P565=B2107 Fault Reset

Additional control can be connected with
P556-P575=B2102-B2115 command word one
P576-P591=B2400-B2415 command word two

P443=K2002 or KK2032 DW speed setpoint

If you would like to run the drive without the main bus being charged, set P372=1.
This puts the CUVC into a simulation mode. Then power up the electronics by putting 24VDC on connector X9.1, 2. This will not work in closed loop vector.

2.1 The Full List of Setpoints and Feedbacks

Drive Receive Words

PZD Words	Read register
Word1-K2001	r550 Command word One
Word2-K2002	Process setpoint 1, If a DW is used it will use Word2 &3 and is seen as KK2032
Word3-K2003	Process setpoint 2
Word4-K2004	r551 Command word Two
Word5-K2005	r31 Free Bit Command word one (Drive PAR P44=K2005)
Word6-K2006	r33 Free Bit Command word Two(Drive PAR P46=K2006)
Word7-K2007	Process setpoint 3, If a DW is used it will use Word7&8 and is seen as KK2037
Word8-K2008	Process setpoint 4
Word9-K2009	Process setpoint 5, If a DW is used it will use Word9&10 and is seen as KK2039
Word10-K20010	Process setpoint 6
Word11-K20011	Process setpoint 7, If a DW is used it will use Word11&12 and is seen as KK2041
Word12-K20012	Process setpoint 8

Table 1 – Data Receive Words

Drive Transmit Words

PZD Words	Value
Word1-P707.1	K32 Status word One
Word2-P707.2	KK151 Process setpoint 1 speed feedback DW
Word3-P707.3	KK151 Process setpoint 2 speed feedback DW
Word4-P707.4	K33 Status word Two
Word5-P707.5	Process setpoint 3
Word6-P707.6	Process setpoint 4
Word7-P707.7	Process setpoint 5
Word8-P707.8	Process setpoint 6
Word9-P707.9	Process setpoint 7
Word10-P707.10	Process setpoint 8

Table 2 – Data Transmit Words

3. UniOP Programming

To configure UniOP for operation with the drive follow the steps listed in this chapter.

1) Choose the communication driver 'Siemens USS' from the list in the 'Change Controller Driver…' dialog box.

2) Set Controller Comm to 9600, Even, 8, 1

3) Set the Slave ID to the value contained in P700.

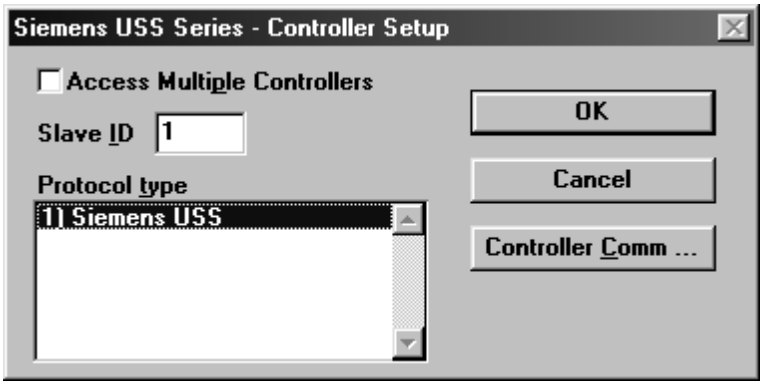

Figure 1 – Controller Setup dialog box

4) The RDA (Reserved Data Area), mailbox and alarms should be used in the Internal Work Buffer memory

5) Dynamic data fields (variables) can be defined in the conventional way using the Data Field Definition dialog box (see figure)

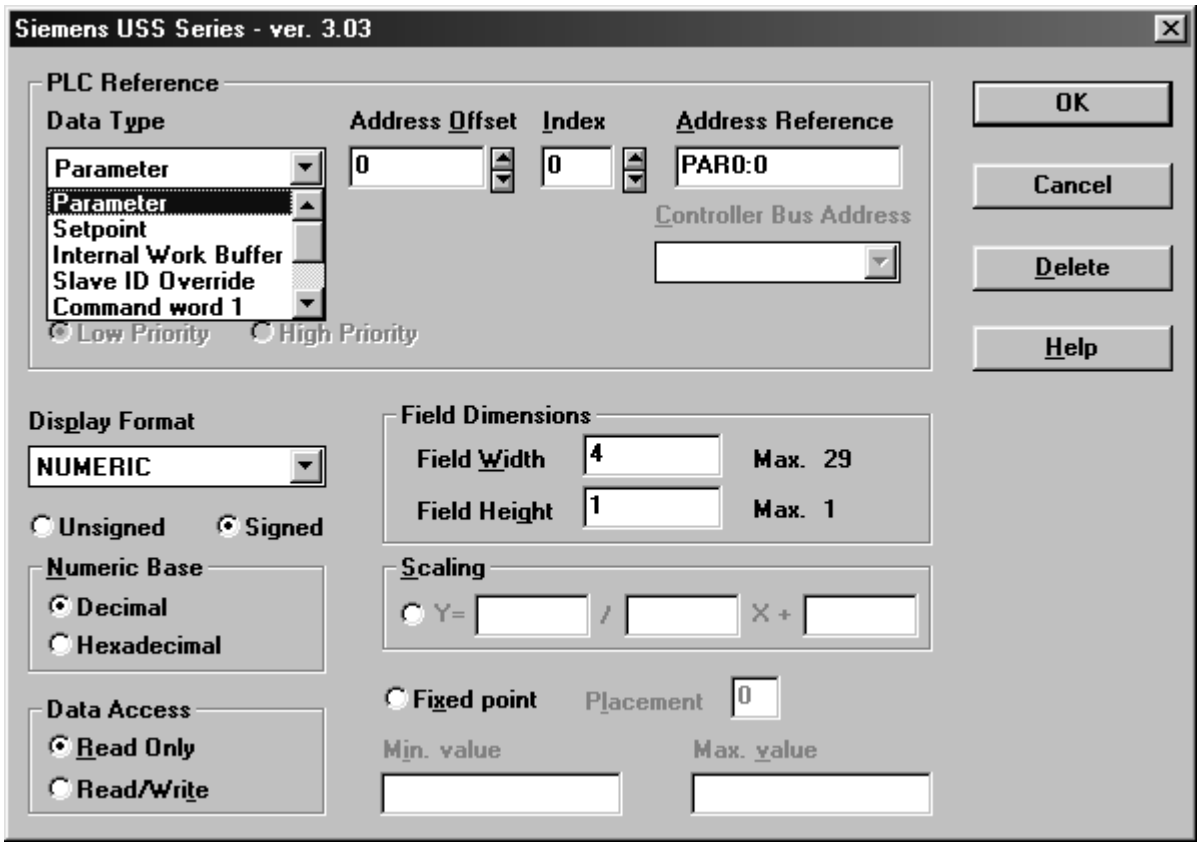

Figure 2 – Data Field Definition dialog box

6) Slave ID Override. If a slave ID override is defined in the project file, the value contained in the field will be the drive unit number to which UniOP will communicate to. This allows the unit number to be changed during run time by the operator.

7) Internal Work Buffer. It is UniOP memory. Internal work buffer 0 – 255 can be freely used (RDA, mailbox, etc.).

8) PZD words. PZD1 is control word 1. PZD2 is the setpoint. PZD2 – 8 are user defineable bit manipulations. You can use PZD3 as control word 2. PZD3 is selected as PZD offset zero. PZD3 is offset 1, P:ZD4 is offset 2, PZD5 is offset 3, PZD6 is offset 4, P:ZD7 is offset 5 and PZD8 is offset 6. A special condition applies to PZD3-8. You must write to command word one bit 0A, after altering and of the contents of PZD3-8. For example, to alter PZD4, use the 'Write to controller' macro, then another Write to controller macro to command word 1.

9) Drive receive words. You can monitor what the drive receives as PZD1-8 by displaying P709.1 – P709.8

10) Setpoint. The setpoint sent to the drive is in a 16-bit format. When the setpoint is read from the drive it is scaled into 32 bits.

11) Actuals. The PZD receive words 3 – 8 represent the Actuals returned in relationship to PZD3-8. Actual 3 is offset zero, offset one is actual 4 and so on.

Appendix A. Communication Error Codes

Current communication status is displayed in the System Menu of the UniOP.
A message and a numeric error code describe the error status.
The message reports the current communication status. The number shows the code of the current communication error or, if the communication is correct, the code of the last error encountered. When the error code 0 is shown, it means there have been no communication errors since this system start-up.

Code	Description	Notes
0	No error	There are no communication errors and there have been no errors since start-up.
1	Not accepted	Incorrect reply for the request
5	Time out	A request was sent without the reply
6	Response error	Too many characters received for the reply
11	Line error	UART framing error

Appendix B. Technical Data and Connection Information

Connect with baud rate of 9600, Even, 8, 1.

Use cable CA174 for RS-232 connection.

UniOP -- Drive
3 ---------- 2
2 ---------- 7
5 ---------- 5