Windows NT 4.0

SPC - DDE-Server

Technical Information

Please keep for further use !

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Author:	SIS

TRSystemtechnik GmbH
Eglishalde 6
D-78647 Trossingen
Germany
Tel. +49 - (0) 7425 / 228-0
Fax +49 - (0) 7425 / 228-34

Imprint

TRSystemtechnik GmbH
D-78647 Trossingen
Eglishalde 6
Tel.: (++49) 07425/228-0
Fax: (++49) 07425/228-34

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This manual was edited using text formatting software on a DOS personal computer. The text was printed in *Arial*.

Fonts

Italics and **bold** type are used for the title of a document or to emphasize text passages.

Passages written in Courier show text which is visible on the display as well as software menu selections.

"< >" refers to keys on your computer keyboard (e.g. <RETURN>).

Note

Text following the "NOTE" symbol describes important features of the respective product.

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Revision History

Note:
The cover of this document shows the current revision status and the corresponding date. Since each individual page has its own revision status and date in the footer, there may be different revision statuses within the document.

Document created: 22.07.1997

Revision	Date
New Item-Formats created DDE-Execute included	11.05.1998
Datablock-copy Definition	28.05.1998
New Main-Screen Information	02.06.1998

Table of contents

1 SPC DDE-Server

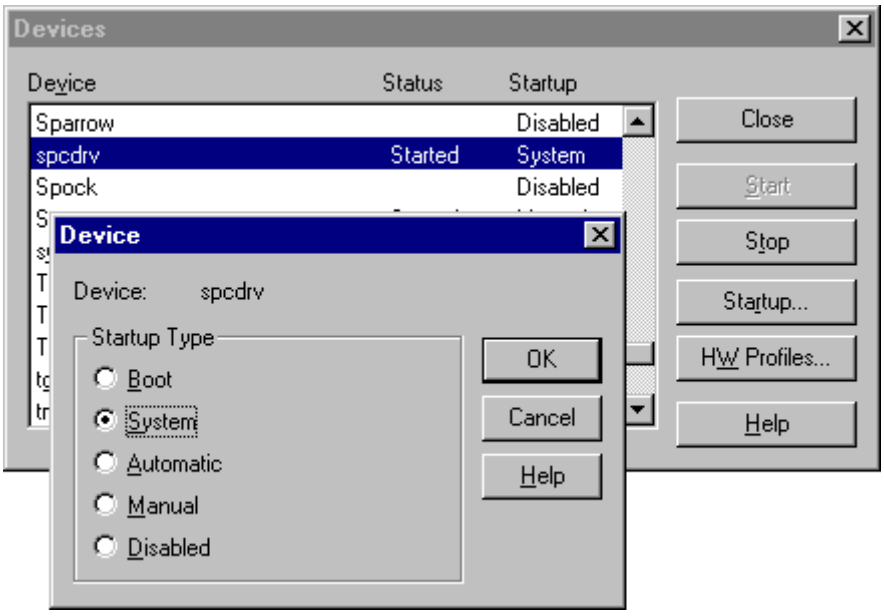
TRS-SPC is a DDE-Server for the TRS-Real-time-PLC running on the second CPU-Card.
It allows the user to easy access all data needed for visualisation.

The DDE-Server supports up to 8 SPC-Boards in one PC.

1.1 Installation

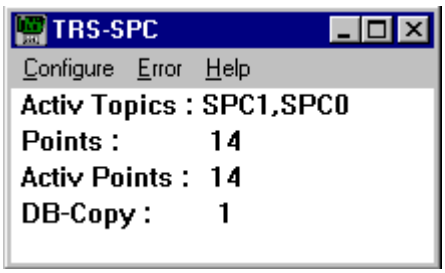
Do the following steps to install your DDE-Server:

1. Log in as Administrator
2. Copy files *TRS-SPC.EXE, TRS-SPC.HLP* and *WWDLG32.DLL* to a directory on your PC
3. Copy the file "SPCDRV.SYS" to "[Systemroot]\system32\drivers", where [Systemroot] is the installation-path of WindosNT .(e.g.: c:\winnt).
4. Start the program *REGSERV* which is on the disk.
5. Reboot your system.
6. When your system has started you can start the SPC-Device driver *SPCDRV* in the "Control Panel" "Devices" (See Pic. 1-1.).
   By setting "Start-up" to "System" your device driver will be started automatically the next time you boot your system.
7. Now start your DDE-Server
8. Configure the DDE-Server to your SPC-board and define the topics you want to use by clicking on the menu `Configure`



Pic. 1-1

1.2 Main Screen



The main screen displays information about its activ topics, points,activ points and DB-Copy definition.

Activ Topics	Displays all topics with a connection to a DDE-Client
Points	Displays the number of connected items
Activ Points	Displays the number of activ items
DB-Copy	Displays the number of defined DB-Copy functions

If any Line is in red the there is an error reading the SPC or in the connection to the DDE-Client.

1.3 Configure Menu

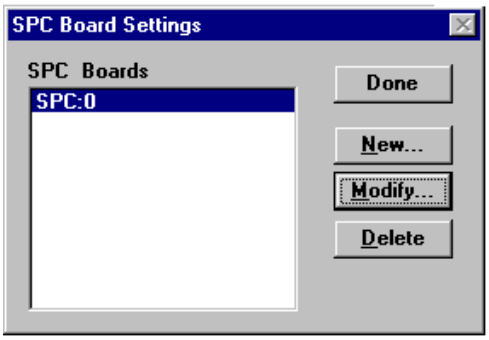
The *Configure*-Menu allows you to adjust the Server to your needs.
It offers the following commands

Board Configuration
Topic Definition
DDE Server Settings
General Settings
DB-Copy Definition

1.3.1 Board Configuration

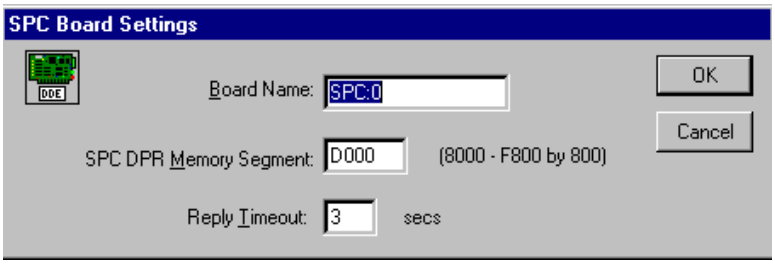
Use this command to adjust the Server to your SPC-Boards. Using this command will open the *SPC Board Settings Dialog* to do the adjustment you need

1.3.1.1 SPC Board Settings Dialog



Done :	Exit this dialog
New :	Define a new SPC-Board
Modify :	Modify an existing SPC-Board
Delete :	Delete an existing Board

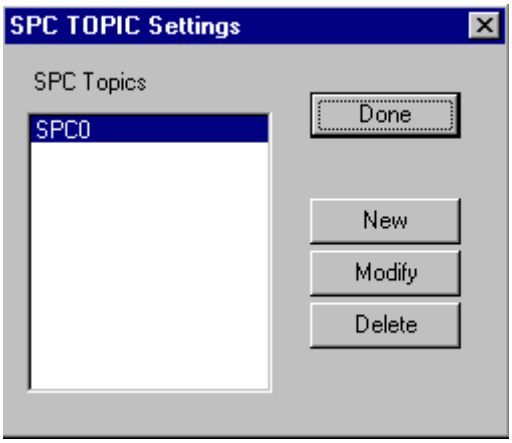
1.3.1.2 SPC Board Settings



Use this dialog to adjust the Server to your SPC Board.

Board Name :	Enter a name of your choice to define the SPC-Board. Use this name to define topics in the "SPC TOPIC Settings" dialog.
SPC DPR Memory Segment :	Tell the Server the segment address of the SPC-Board. (See documentation of your board)
Reply Time-out :	Used to react on an DDE-Time-out

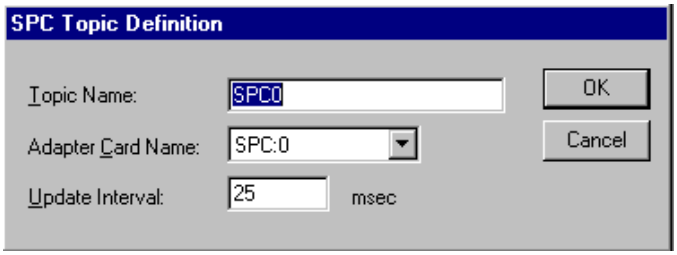
1.3.2 SPC TOPIC Settings



Use this dialog to define different topics which you use for communication with your Visualisation

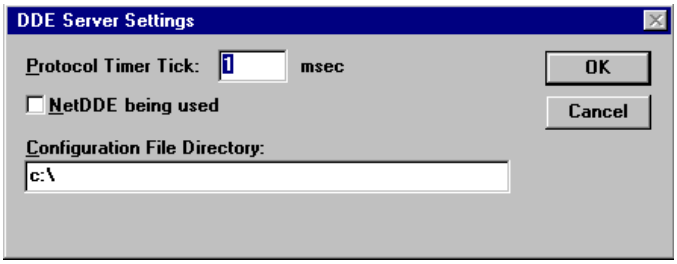
Done :	Exit this dialog
New :	Define a new SPC-Board
Modify :	Modify an existing SPC-Board
Delete :	Delete an existing Board

1.3.2.1 SPC Topic Definition



Topic Name :	Enter a name of your choice to define a topic
Board Name :	Enter the name of your SPC-Board
Update Interval :	Time interval used for updating data and sending data to Visualisation

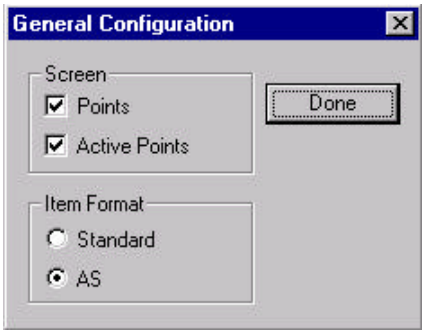
1.3.3 DDE Server Settings



Use this command to do some DDE-configuration

Protocol Timer Tick :	Time interval of the server used to update the Topic Timers
NetDDE being used :	Use NetDDE
Configuration File Directory :	Location where to store the Servers configuration data

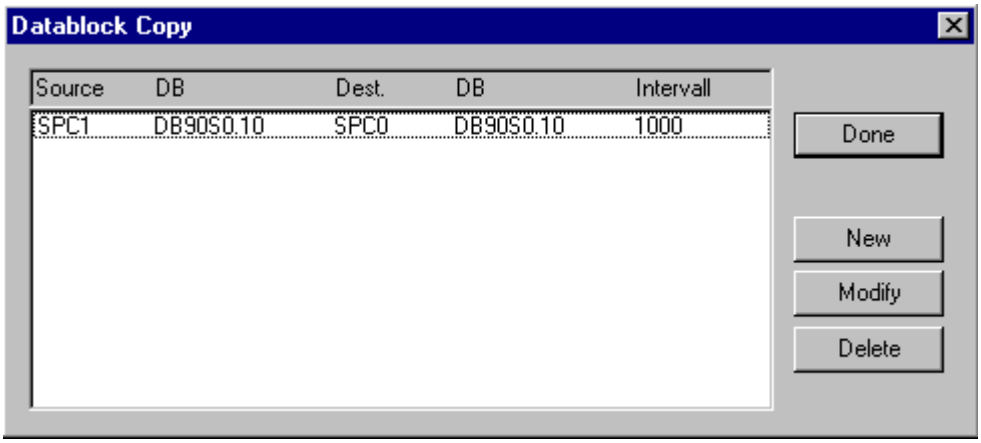
1.3.4 General Settings



Points	Display number of created points
Active Points	Display number of connected Points
Standard	Use standard Itemformat for Datablocks (see Items)
AS	Use AS-Itemformat for Datablocks (see Items)

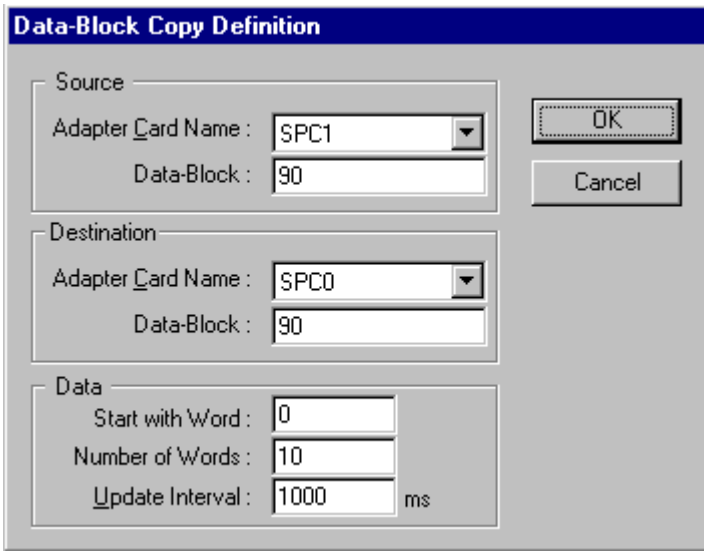
1.3.5 DB-Copy Definition

Use this command to tell the Server to copy datablocks from SPC to SPC



Done :	Exit this dialog
New :	Define a new Copy-Block
Modify :	Modify an existing Copy-Block
Delete :	Delete an existing Copy-Block

1.3.5.1 Data-Block Copy Definition



Use this command to define a new or modify an existing Datablock-Copy-Definition

Source	Adapter Card Name	Name of Board to copy Data from (see Board Configuration)
	Data-Block	Source Datablock
Destination	Adapter Card Name	Name of Board to copy Data to (see Board Configuration)
	Data-Block	Destination Datablock
Data	Start with Word	First word to copy
	Number of Words	Number of words to copy
	Update Intervall	Timeintervall for copying data

1.4 Error Menu

Clear	Clear all errors

1.5 Help Menu

Check SPC	Check if SPC can be found at the defined memory segment
Contents	Displays help information
About Server	Use this command to display the copyright notice and version number of your Server.

2 Item Data Format

Following items are defined for reading and writing data to and from the SPC-Board.

T	Timer
Z	Counter
M	Flag (marker)
A	Outputs
E	Inputs
K	K-Flag (couple-marker)
D	Data-Blocks
S	Status
X	Extended
B	Block

2.1 Timer

Use this item to read a timer value.

Data Format	Item	Suffix	DDE Type	Range
Word	Tx		Integer	0 - 999
Real	Tx	KT	Real	0.0 - 999.3

x = 0 - 255
All Timers are **Read Only**

Example:

Job	Item
Read Timer 12 as Word	T12
Read Timer 22 as Real	T22KT

2.2 Counter

Use this item to read a counter value.

Data Format	Item	Suffix	DDE Type	Range
Word	Zx		Integer	0 - 999

x = 0 - 255
All Counters are **Read Only**

Example:

Job	Item
Read Counter 12 as Word	Z12

2.3 Flag (marker)

Use this item to read a flag value.

Data Format	Item	Suffix	DDE Type	Range
Bit	Mx.y		Discrete	0 or 1
Byte	MBx		Integer	0 to 255
		KF	Integer	-128 to 127
Word	MWx		Integer	0 to 65535
		KF	Integer	-32768 to 32767
		KT	Real	0.0 to 999.3

x = 0 - 255 y = 0 - 7
All Flags are **Read Only**

Example:

Job	Item
Read Flag 10 Bit 1	M10.1
Read Flag 123 as Byte	MB123
Read Flag 123 as Word	MW123
Read Flag 123 as Signed Word	MW123KF

2.4 Outputs

Use this item to read an output value.

Data Format	Item	Suffix	DDE Type	Range
Bit	Ax.y		Discrete	0 or 1
Byte	ABx		Integer	0 to 255
		KF	Integer	-128 to 127
Word	AWx		Integer	0 to 65535
		KF	Integer	-32768 to 32767

x = 0 - 255 y = 0 - 7
All Outputs are **Read Only**

Example:

Job	Item
Read Output 10 Bit 1	A10.1
Read Output 123 as Byte	AB123
Read Output 123 as Word	AW123
Read Output 123 as Signed Word	AW123KF

2.5 Inputs

Use this item to read an input value.

Data Format	Item	Suffix	DDE Type	Range
Bit	Ex.y		Discrete	0 or 1
Byte	EBx		Integer	0 to 255
		KF	Integer	-128 to 127
Word	EWx		Integer	0 to 65535
		KF	Integer	-32768 to 32767

x = 0 - 255 y = 0 - 7
All Inputs are **Read Only**

Example:

Job	Item
Read Input 10 Bit 1	E10.1
Read Input 123 as Byte	EB123
Read Input 123 as Word	EW123
Read Input 123 as Signed Word	EW123KF

2.6 K-Flags (Koppelmerker)

Use this item to read or write to a K-Flag.

For reading use KE

Data Format	Item	Suffix	DDE Type	Range
Bit	KEx.y		Discrete	0 or 1
Byte	KEBx		Integer	0 to 255
		KF	Integer	-128 to 127
Word	KEWx		Integer	0 to 65535
		KF	Integer	-32768 to 32767
		KT	Real	0.0 to 999.3

x = 0 - 255 y = 0 - 7
All KE-Flags are Read Only

Example:

Job	Item
Read Flag 10 Bit 1	KE10.1
Read Flag 123 as Byte	KEB123
Read Flag 123 as Word	KEW123
Read Flag 123 as Signed Word	KEW123KF

For writing use KA

Data Format	Item	Suffix	DDE Type	Range
Bit	KAx.y		Discrete	0 or 1
Byte	KABx		Integer	0 to 255
		KF	Integer	-128 to 127
Word	KAWx		Integer	0 to 65535
		KF	Integer	-32768 to 32767
		KT	Real	0.0 to 999.3

x = 0 - 255 y = 0 - 7

Example:

Job	Item
Write Flag 10 Bit 1	KA10.1
Write Flag 123 as Byte	KAB123
Write Flag 123 as Word	KAW123
Write Flag 123 as Signed Word	KAW123KF

2.7 Data Blocks

There are two different Itemformats for reading and writing Datablocks. Use the 'General Settings' Command in the Menu to set the format you wish to use.

2.7.1 Standard-Format

Use this item to read or write to a Data Block

Data Format	Item	Suffix	DDE Type	Range
Bit	DBx Dy.z		Discrete	0 or 1
Left Byte	DBx DLy		Integer	0 to 255
		KF	Integer	-128 to 127
Right Byte	DBx DRy		Integer	0 to 255
		KF	Integer	-128 to 127
Word	DBx DWy		Integer	0 to 65535
		KF	Integer	-32768 to 32767
		T	Integer	0 to 65535
Double Word	DBx DDy		Integer	-2147483648 to 2147483647
		KG	Real	float value
		T	Integer	-2147483648 to 2147483647
String	DBx Sv.w		Message	-32768 to 32767
Array	DBx Av.w		Message	-32768 to 32767

x = 0 - 255 y = 0 - 255 z = 0 - 15
v = 0-255 w = 0-255
When data is transmitted as an array each value is seperated by a space-char (20H)
T is used to ignore the digital group symbol (.)

Example:

Job	Item
Data left 10 Block 5	DB5DL10
Dataword 123 Block 10	DB10DW123
Datadoubleword 6 Block 17	DB17DD6
Datword 12 Block 7 signed Word	DB7DW12KF
String Block7 start at Word 6 7 Words	DB7S6.7
Array Block7 start at Word 6 7 Words	DB7A6.7

2.7.2 AS-Format

Use this item to read or write to a Data Block

Data Format	Item	DDE Type	Range
Bit	DBx By.z	Discrete	0 or 1
Left Byte	DBx DLy	Integer	-128 to 127
Left Byte Unsigned	DBx UDLy	Integer	0 to 255
Left Byte BCD-coded	DBx BCDDLy	Integer	0 to 99
Right Byte	DBx DRy	Integer	-128 to 127
Right Byte Unsigned	DBx UDRy	Integer	0 to 255
Right Byte BCD-coded	DBx BCDDLy	Integer	0 to 99
Word	DBx Wy	Integer	-32768 to 32767
Word Unsigned	DBx UWy	Integer	0 to 65535
Word BCD-Coded	DBx BCDWy	Integer	0 to 9999
Double-Word	DBxLy	Integer	-2147483648 to 2147483647
Float	DBx Fy	Real	float Vale

x = 0 - 255 y = 0 - 255 z = 0 - 15
v = 0-255 w = 0-255

To transmit Data as an arry append 'An' at the end of your item, where n is the number of values which are transmitted. Each value is seperated by a space-char (20H).

Example:

Job	Item
Data left 10 Block 5	DB5DL10
Dataword 123 Block 10	DB10W123
Datadoubleword 6 Block 17	DB17L6
Datword 12 Block 7 unsigned Word	DB7UW12
Array Block7 start at Word 6 7 Words	DB7W6A7

2.8 PLC - Status

Use this item to read the PLC Status

Data Format	Item	Suffix	DDE Type	Range
Bit	S0		Discrete	0 or 1

PLC-Status is **Read Only**

1 PLC running
0 PLC stopped

2.9 Extended

Use this item to access any adress in the DPR of the SPC.

Data Format	Item	Suffix	DDE Type	Range
Word	Xv		Word	-32768 to 32767

v = Offset in DPR (0 to 8190) allways in HEX

Example:

Job	Item
Read Error in DPR at Adrress 1042H	X1042
Set data in special-functions at 1044H	X1044

2.10 Block

Use this item to access any adress in the DPR of the SPC as a block (string)

Data Format	Item	Suffix	DDE Type	Range
String	Bx.y		Message	0 to 65535

x = 0 to 8190 (adress in DPR)
y = 0 to 8190 (size of string)

Example:

Job	Item
Read all Flags (Merker) in DPR at adress 200H	B512.256

3 DDE (dynamic data exchange)

A form of interprocess communications that uses shared memory to exchange data between applications. Applications can use DDE for one-time data transfers and for ongoing exchanges in applications that send updates to one another as new data becomes available.
Following DDE-Communications are valid for this Server

Initiate
Terminate
Advise
Unadvise
Request
Poke
Execute

For the format of Item in the DDE-Communications see chapter Item-Format

3.1 DDE-Terminate

A DDE client posts a TERMINATE message to tell the Server to terminate a conversation.

3.2 DDE-Poke

A DDE client application posts a POKE message to the Server application. A client uses this message to request the server to accept an unsolicited data item.

For the format of Item in the DDE-Communications see chapter Item-Format

3.3 DDE-Request

A DDE client application posts a REQUEST message to the Server application to request the value of a data item.
For the format of Item in the DDE-Communications see chapter Item-Format

3.4 DDE-Advise

A DDE client application posts the WM_DDE_ADVISE message to a DDE server application to request the server to supply an update for a data item whenever the item changes.
For the format of Item in the DDE-Communications see chapter Item-Format

3.5 DDE-Unadvise

A DDE client application posts a UNADVISE message to inform the Server application that the specified item should no longer be updated. This terminates the warm or hot data link for the specified item.
For the format of Item in the DDE-Communications see chapter Item-Format

3.6 DDE-Initiate

A DDE client application sends a INITIATE message to initiate a conversation with a server application responding to the specified application and topic names. Upon receiving this message, all server applications with names that match the specified application and that support the specified topic are expected to acknowledge it.
Application and Topic Name for this Server is:

Application:	**TRS-SPC**
Topic:	see *Configure* Menu

3.7 Topic

A string that identifies the type of data requested by a dynamic data exchange (DDE) client application.
see also SPC Topic Definition

3.8 Application

A string that identifies the Server requested by a dynamic data exchange (DDE) client application.

Application:	TRS-SPC

3.9 DDE-Execute

A DDE client application posts a EXECUTE message to a DDE server application to send a string to the server to be processed as a series of commands. The server application posts a WM_DDE_ACK message in response.

Follwing Execute-command-strings are valid for Server:

C0:	Copy any Data from SPC to SPC
C1:	Copy Datablocks from SPC to SPC
C2:	Clear Errors

3.9.1 C0 - Command

The excute **C0**-command is used to copy data from the DPR of one SPC to the DPR of a second SPC.

Format:

C0:`SPC1,Offset1,Size1,SPC2,Offset2`

`SPC`	Board-Name of Source-SPC (see Board Configuration)
`Offset 1`	Offset in DPR of Source
`Size 1`	Number of Bytes to Copy
`SPC2`	Board-Name of Destination-SPC (see Board Configuration)
`Offset2`	Offset in DPR of Destination

Example:

Job	Command
Copy 64 bytes from SPC1 at DPR-Offset 1100H to SPC2 DPR-Offset 1140H	C0:SPC1,4352,64,SPC2,4416

3.9.2 C1 - Command

The excute **C1**-command is used to copy datablocks from one SPC to Datablocks of a second SPC.

Format:

C1:`SPC1,SourceDB,SPC2,DestinationDB`

`SPC1`	Board-Name of Source-SPC (see Board Configuration)
`SourceDB`	Source Datablock (defined as String)
`SPC2`	Board-Name of Destination-SPC (see Board Configuration
`DestinationDB`	Destination Datablock (defined as String)

Example:

Job	Command
Copy 50 bytes from datablock 10 beginning with dataword 2 in SPC1 to datablock 5 Word 10 in SPC2	C1:SPC1,DB10S2.50,SPC2,DB5S10.50

3.9.3 C2 - Command

The excute **C2**-command clears all errors the server found while reading one SPC-Board.