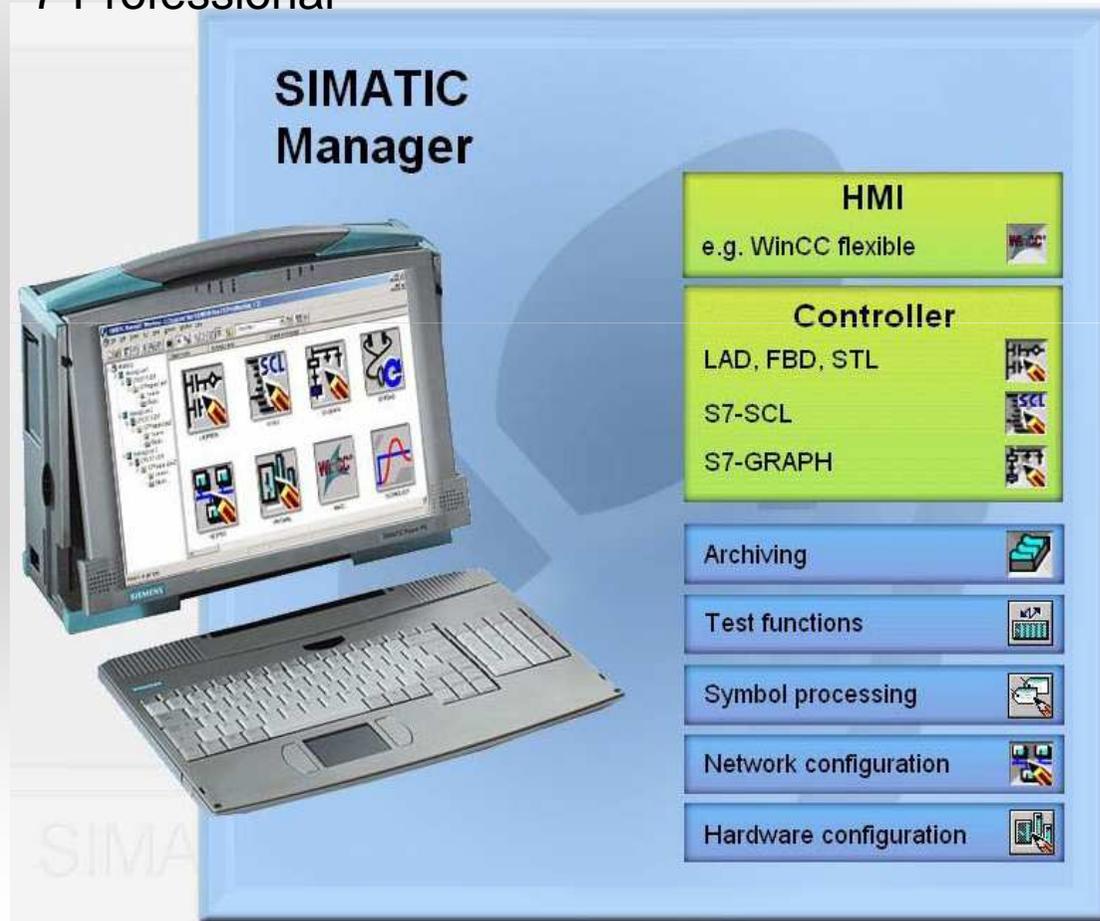
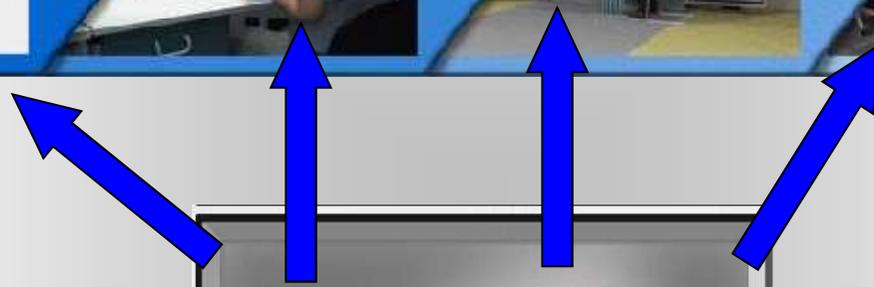
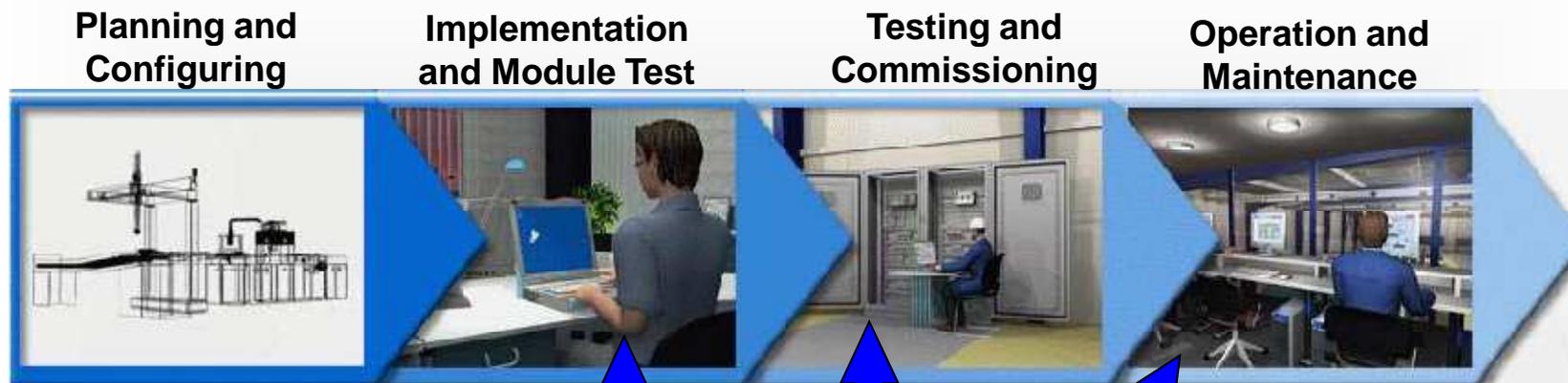


INTRODUCTION TO THE SIMATIC MANAGER

- The four phases for creating an automation solution
- Runtime environment of the SIMATIC Manager
- Integrated tools in STEP 7 Professional



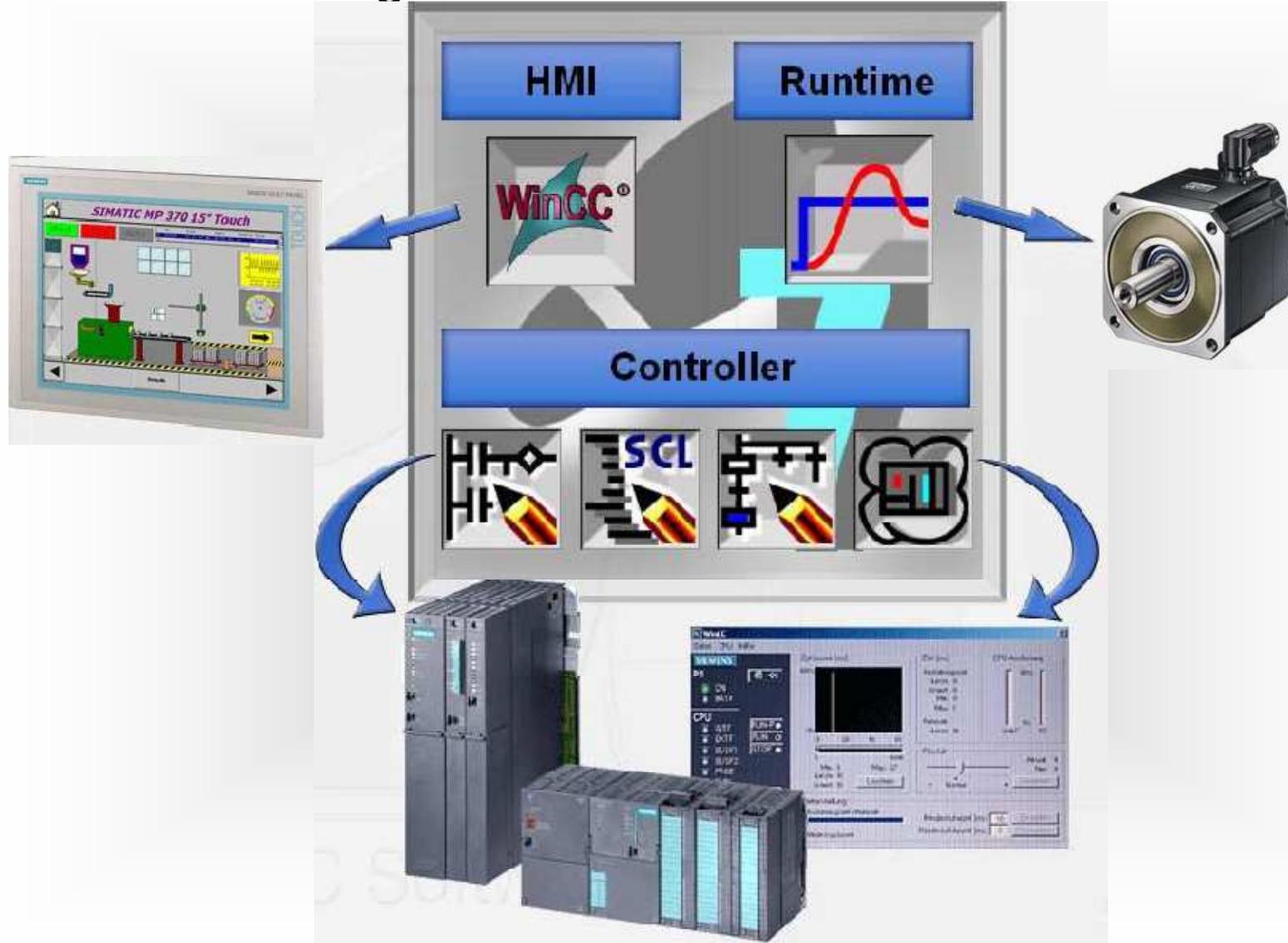
The four phases for creating an automation solution



Runtime environment of the SIMATIC Manager

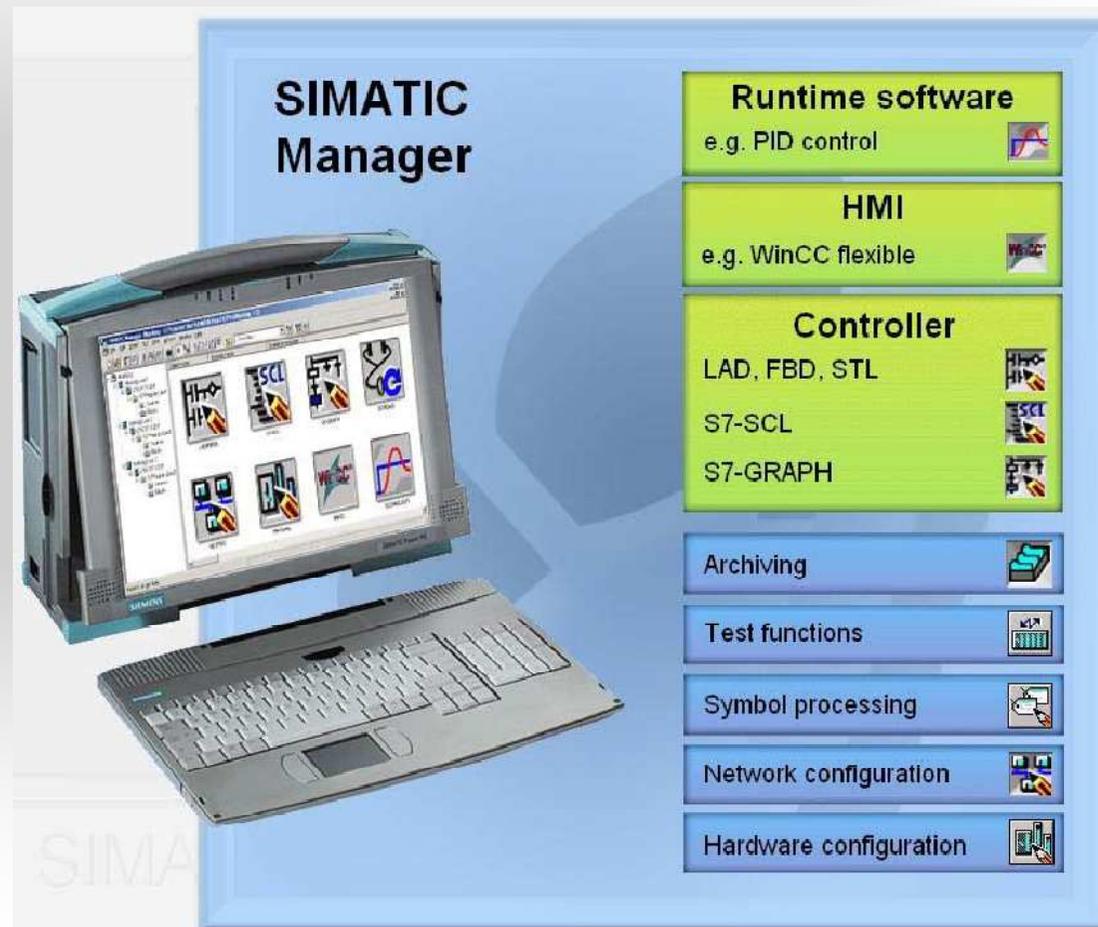


Integrated tools in STEP 7 Professional

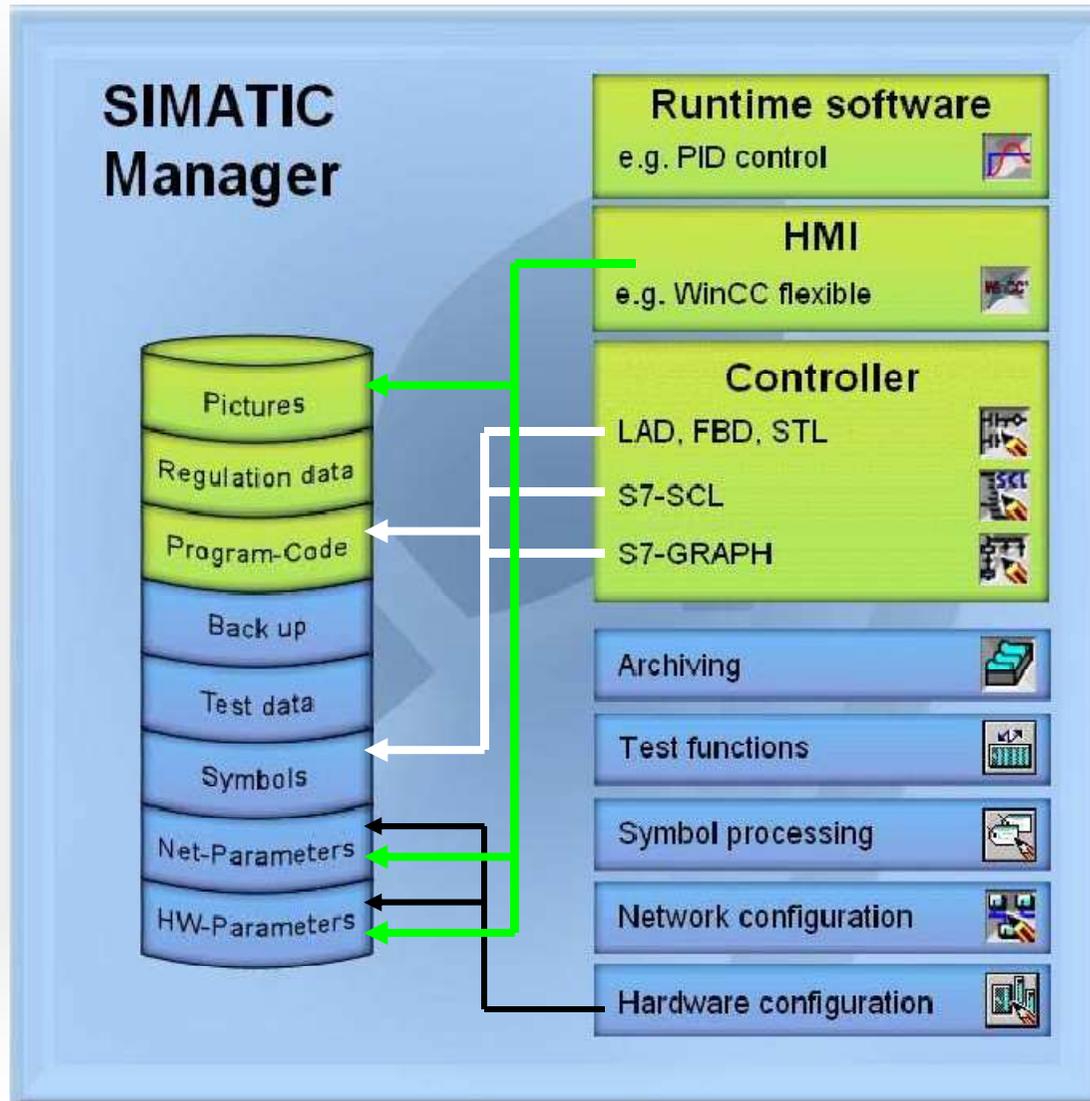


Block diagram of the SIMATIC Manager

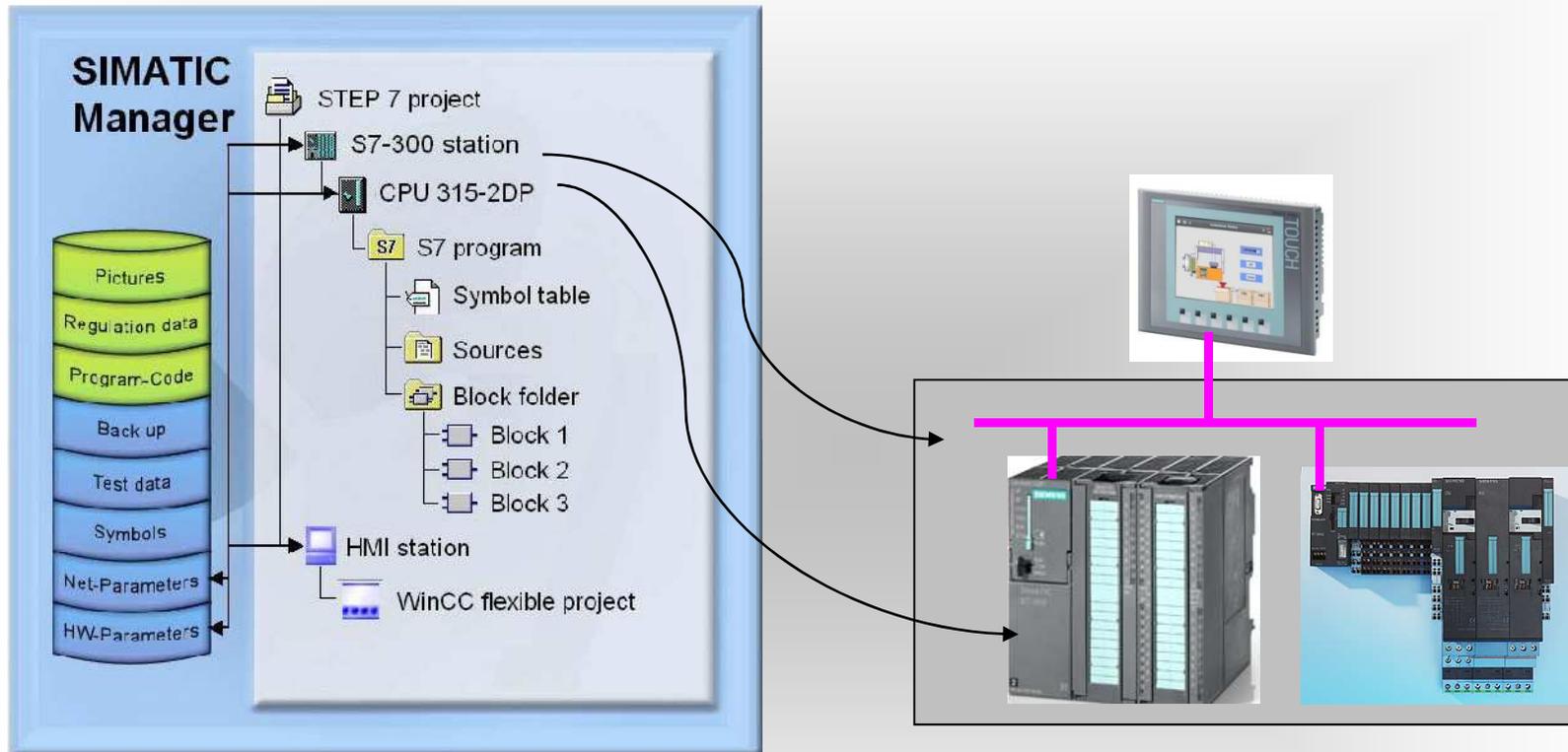
- ❑ Tasks of the SIMATIC Manager
- ❑ Project structure of an automation plant in the SIMATIC Manager



Tasks of the SIMATIC Manager

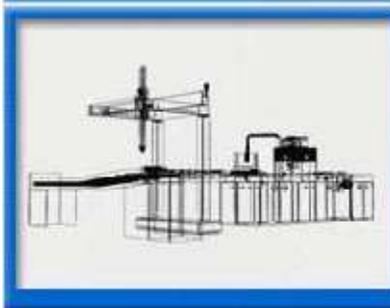


Project structure of an automation plant in the SIMATIC Manager



Demonstration of a typical project creation with the SIMATIC Manager

Planning and Configuring



- Laying out project with station
- Configuring hardware
- Projecting connection

Implementation and Module Test



- Create the symbols
- Develop the control program
- Program test module by module
- Configure the visualization

Testing and Commissioning



- Loading program
- Test in the regular operation
- Archiving and backup

Operation and Maintenance

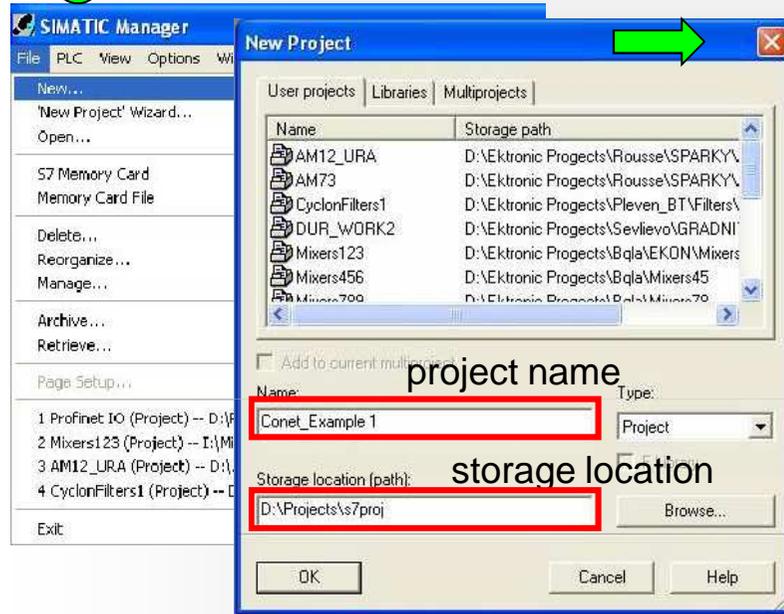


- Teleservice

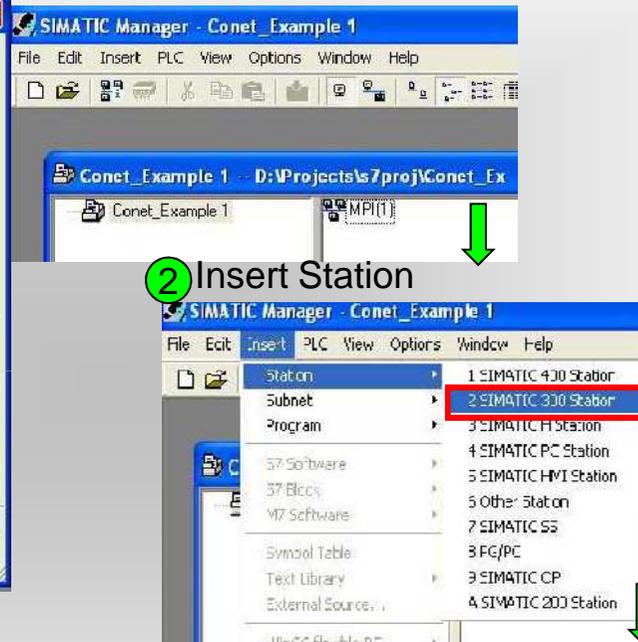
Planning and Configuring

Laying out project with Station

1 generate a new project



2 Insert Station



3 starting the hardware configuration tool



Planning and Configuring

Configuring Hardware – HW Config

The screenshot shows the HW Config interface for a SIMATIC 300 PLC. The rack configuration is as follows:

Slot	Module
1	PS 307 5A
2	CPU 315F-2PN
X1	MPV/DP
X2	PN-IO
X2 P1	Port 1
X2 P2	Port 2
3	DI16/DO16x24V...
4	AI4/AO2x8/8Bit
5	DI16/DO16x24V/0.5A
6	AI4/AO2x8/8Bit

Slot 3 is highlighted with a blue box and labeled "Non SIEMENS Hardware". The hardware catalog on the right is also highlighted with a red box and labeled "Hardware catalog".

Update Hardware catalog

The screenshot shows the 'Options' menu with 'Update Catalog' highlighted.

Install Manufacturer GSD file

The screenshot shows the 'Options' menu with 'Install GSD File...' highlighted.

Planning and Configuring

Configuring Hardware – HW Config

The screenshot displays the SIMATIC Manager HW Config interface. The main window shows a rack configuration for a SIMATIC 300(1) system. The rack is connected to an Ethernet(1) PROFINET IO-System (100) and a PROFIBUS(1) DP master system. The rack contains the following modules:

- (1) PS 307 5A
- (2) IM 151-3
- (3) WAGO
- (4) FL IL BK
- (5) bk.91J3
- (6) IE-XPBK

The PROFIBUS(1) DP master system is connected to two DP slaves:

- [1/7] IM 151-3
- [3/8] BK 3L DP-NORM

The left sidebar shows the hardware catalog with the following items selected:

- PS 307 5A
- LPU 315F-2PN
- MPI/DP
- PN-IO
- Port 1
- Port 2
- DI 16/DO 16x24V/0.5A
- N/A/AU 2x8/8Bit

The bottom window shows the 'Module Address and parameters' table for the rack configuration:

Slot	Module	Order number	Firmware	MPI ad...	I address	Q address	Comment
1	PS 307 5A	6ES7 307-1EA00-0AA0					
2	CPU 315F-2PN/DP	6ES7 315-2EJ14-0AB0	V3.1	2			
X1	MPI/DP			2	204*		
X2	PN-IO				2046*		
X21	Port 1				2045*		
X22	Port 2				2044*		
3							
4	DI16/DO16x24V/0.5A	6ES7 323-1BL00-0AA0			0..1	0..1	
5	N/A/AU 2x8/8Bit	6ES7 334-1UL01-0AA0			2/2..2/3	2/2..2/5	
6							
7							
8							

Planning and Configuring

Configuring Hardware – HW Config

Manual tuning

Negative result of the check

The screenshot displays the SIMATIC Manager HW Config interface. A 'Properties' dialog box for 'AI4/AO2x8/8Bit (R0/S5)' is open, showing the 'Addresses' tab. The 'System default' checkbox is highlighted with a red box. Another 'Properties' dialog box for '2DI DC24V ST - (R-/S2)' is also open, showing the 'Addresses' tab. A third 'Properties' dialog box is open, displaying an error message: 'The address you entered is not valid.' The 'New address' field contains the value '18'. The background shows a rack configuration table with various modules and their order numbers.

Slot	Module	Order number
1	PS 307 5A	6ES7 307-1EA00-0AA0
2	CPU 315F-2PN	6ES7 315-2CG03-0AB0
X1	MP/DI	
X2	PN-DI	
X2 P1	Port 1	
X2 P2	Port 2	
3		
4	DI16/DO16x24V/0.5A	6ES7 323-1BL00-0AA0
5	AI4/AO2x8/8Bit	6ES7 334-1CG03-0AB0
6		
7		
8		

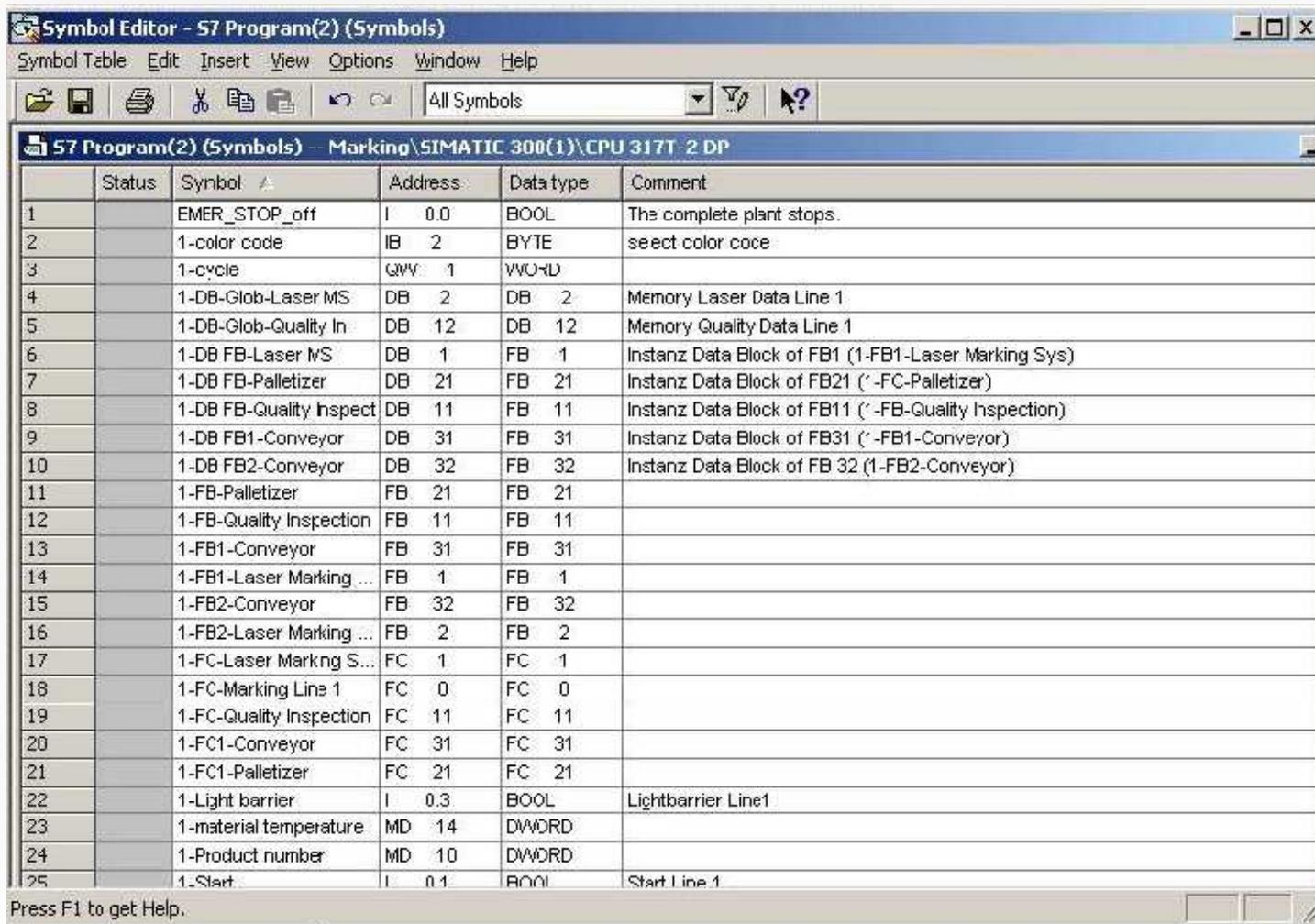
Planning and Configuring

Configure network

Station	Interface	IP address	MAC address	Device number
SIMATIC 300(1)	PN-IO	192.168.0.1	/- - - - -	0
SIMATIC 300(1)	SCALANCE-X208	192.168.0.2	/- - - - -	1
SIMATIC 300(1)	IM151-3	192.168.0.3	/- - - - -	2
SIMATIC 300(1)	WAGO-750-340	192.168.0.4	/- - - - -	3

Implementation and Module Test

Create the symbols



Symbol Editor - S7 Program(2) (Symbols)

Symbol Table Edit Insert View Options Window Help

4 All Symbols

S7 Program(2) (Symbols) -- Marking\SIMATIC 300(1)\CPU 317T-2 DP

	Status	Symbol	Address	Data type	Comment
1		EMER_STOP_off	I 0.0	BOOL	The complete plant stops.
2		1-color code	IB 2	BYTE	select color coce
3		1-cycle	QWV 1	WORD	
4		1-DB-Glob-Laser MS	DB 2	DB 2	Memory Laser Data Line 1
5		1-DB-Glob-Quality In	DB 12	DB 12	Memory Quality Data Line 1
6		1-DB FB-Laser MS	DB 1	FB 1	Instanz Data Block of FB1 (1-FB1-Laser Marking Sys)
7		1-DB FB-Palletizer	DB 21	FB 21	Instanz Data Block of FB21 (1-FB-Palletizer)
8		1-DB FB-Quality Inspect	DB 11	FB 11	Instanz Data Block of FB11 (1-FB-Quality Inspection)
9		1-DB FB1-Conveyor	DB 31	FB 31	Instanz Data Block of FB31 (1-FB1-Conveyor)
10		1-DB FB2-Conveyor	DB 32	FB 32	Instanz Data Block of FB 32 (1-FB2-Conveyor)
11		1-FB-Palletizer	FB 21	FB 21	
12		1-FB-Quality Inspection	FB 11	FB 11	
13		1-FB1-Conveyor	FB 31	FB 31	
14		1-FB1-Laser Marking ...	FB 1	FB 1	
15		1-FB2-Conveyor	FB 32	FB 32	
16		1-FB2-Laser Marking ...	FB 2	FB 2	
17		1-FC-Laser Marking S...	FC 1	FC 1	
18		1-FC-Marking Line 1	FC 0	FC 0	
19		1-FC-Quality Inspection	FC 11	FC 11	
20		1-FC1-Conveyor	FC 31	FC 31	
21		1-FC1-Palletizer	FC 21	FC 21	
22		1-Light barrier	I 0.3	BOOL	Lightbarrier Line1
23		1-material temperature	MD 14	DWORD	
24		1-Product number	MD 10	DWORD	
25		1-Start	I 0.1	BOOL	Start Line 1

Press F1 to get Help.

Implementation and Module Test

Develop the control program

The screenshot shows the SIMATIC Manager interface. On the left is a project tree for 'Marking' containing a SIMATIC 300 station with a CP 1.3 DP and an S7 Program. The main area displays a table of objects in the project.

Object name	Symbolic name	Created in language	Size in the work memory	Type
System data	---	---	---	SCE
DB1	Cycle		38	Organization Block
FB1	1-FB1-Laser Marking Sys	STL	38	Function Block
FB2	1-FB2-Laser Marking Sys	STL	38	Function Block
FB3		STL	00	Function Block
FB4		STL	38	Function Block
FB11	1-FB- Quality Inspection	STL	38	Function Block
FB13		LAD	00	Function Block
FC1	1-FC-Laser Marking Sys	STL	38	Function
FC2		STL	38	Function
FC3		FBD	38	Function
FC4		FBD	38	Function
DB1	1-DB FB-Laser MS	DB	38	Data Block
DB2	1-DB Glob Laser MS	DB	38	Data Block
DB3		DB	38	Data Block
UDT1	UDT Quality Inspection	STL	---	Data Type
UDT2		STL	---	Data Type
VAT_1	VAT_1		---	Variable Table

Implementation and Module Test

Develop the control program

Properties - Function Block

Name: FB5 Multiple Instance Capability

Symbolic Name:

Symbol Comment:

Created in Language: **STL** (selected from dropdown: LAD, STL, LAD, FBD)

Project path:

Storage location of project:

Date created: 04/10/2007

Last modified: 04/10/2007

Comment:

Ladder Editor

Network 2: Display lamp for Cooling Pump OFF
 Pump is in stop and the lamp for "switched off" is activated.

```

  #pump_stop L
  |---|/|---( )---#pump_off
  
```

SCL Editor

```

// Find the maximum of the lower part of the array
// and swap it with the last value of it.
// *****

// At the beginning, the whole array is unsorted
FOR Idx1:= MAXSIZE TO 0 BY -1 DO
  // Copy actual values
  MaxVal := arrValues[Idx1];
  MaxIdx := Idx1;

  // FIND maximum OF the unsorted ARRAY
  // go up to actual value - 1
  FOR Idx2:= 0 TO Idx1-1 DO
    IF arrValues[Idx2].Index > MaxVal.Index THEN
      MaxVal := arrValues[Idx2];
      MaxIdx := Idx2;
    END_IF;
  END_FOR;

  // If I have found a new maximum, then swap it with
  // the actual value

END_FOR;
  
```

Implementation and Module Test

Program test module by module – S7 PLCSIM

PLCSIM
Start Button

The screenshot shows the SIMATIC Manager interface with the S7-PLCSIM - SimView window open. The window displays the following components:

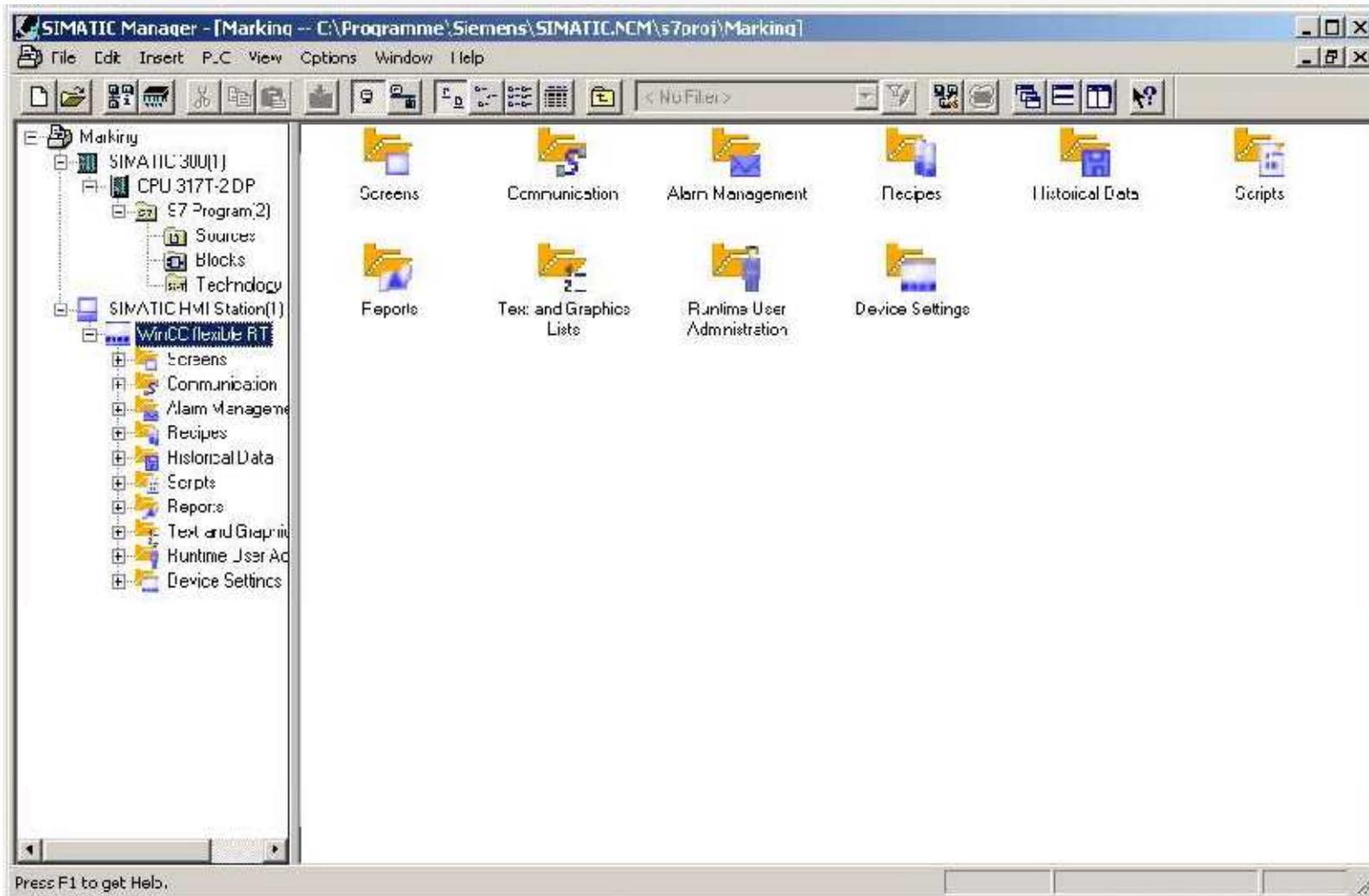
- Toolbar:** Contains various icons for simulation control, including a red box around the 'Start Button'.
- Object List:** Shows the project structure with SIMATIC 300(1) and CPU 317-2 DP.
- Simulated Inputs:** A section with two bit input registers:

IB 0	IB 1
Deciml	Bits
0	7 6 5 4 3 2 1 0
- Resulted Outputs:** A section with two bit output registers:

QB 0	QB 2
Hex	Bits
0	7 6 5 4 3 2 1 0

Implementation and Module Test

Configure the visualization – WinCC Flexible



Testing and Commissioning

Loading program

The screenshot shows the SIMATIC Manager interface. The top window is titled 'SIMATIC Manager - [Marking -- C:\Programme\Siemens\SIMATIC.NCM\s7proj\Marking]'. The 'Object name' table is as follows:

Object name	Symbolic name	Type	Size	Author	Last modified	Co
Hardware	...	Station configuration	...	...	24.09.2004 14:16:46	...
CPU 317T-2 DP	...	CPU	...	...	23.09.2004 14:09:55	...

A red box highlights the 'Program Download' button in the toolbar. A green arrow points to the 'Yes' button in the 'Download (13:4469)' dialog box, which contains the following text:

Do you want to delete the system data in the programmable controller completely and replace them with offline system data?

Do not display this message again

Buttons: Yes, No, Cancel, Help

Below the dialog box, another window titled 'SIMATIC Manager - [Marking -- C:\Programme\Siemens\SIMATIC.NCM\s7proj\Marking ONLINE]' is shown. A red box highlights the 'Show program Online' button in its toolbar.

Testing and Commissioning

Archiving and backup

Object name	Symbolic name	Type	Size	Author	Last modified	Com
SIMATIC 300(1)	...	SIMATIC 300 Station	...	...	24.09.2004 14:16:46	
CPU 317T-2 DP	...	SIMATIC HMI Station	...	...	24.09.2004 15:47:12	
S7 Program(2)	...	MPI	2984	...	22.09.2004 11:01:57	
Sources	...	PROFIBUS	7620	...	24.09.2004 13:30:37	
Elocks	...					
Technology	...					
SIMATIC HMI Station(1)	...					

```

C:\PROGRA~1\Siemens\SIMATIC.NCM\57BIN\pkzipc.exe
<74.8%>, done.
Adding File: Marking/HmiEs/ICONS/Folder-NavControlSettingsFolder.ICO Deflating
<82.6%>, done.
Adding File: Marking/HmiEs/ICONS/Folder-Reports.ICO Deflating <69.0%>, done.
Adding File: Marking/HmiEs/ICONS/Folder-RTUserAdmin.ICO Deflating <67.0%>,
done.
Adding File: Marking/HmiEs/ICONS/Folder-Screen Navigation.ICO Deflating
<73.7%>, done.
Adding File: Marking/HmiEs/ICONS/Folder-SettingsFolderPath.ICO Deflating
<87.2%>, done.
Adding File: Marking/HmiEs/ICONS/Folder-Users.ICO Deflating <80.5%>, done.
Adding File: Marking/HmiEs/ICONS/GraphX.HmiScreen.ICO Deflating <69.8%>, do
ne.
Adding File: Marking/HmiEs/ICONS/Project.HmiFolder.ICO Deflating <45.0%>, d
one.
Adding File: Marking/HmiEs/PROJECT_1/PROJECT_1.hmi Deflating 64%
    
```

Operation and Maintenance

Teleservice

The screenshot shows the SIMATIC Manager interface with the Teleservice menu open. The 'Establish...' option is selected, and the 'Establish Connection' dialog box is displayed. The dialog box contains the following information:

Plant	
Name:	Making
Number to dial:	12345
Modem Connection	
Modem:	Spotster 28800-33600 External
Location:	Ruse
Status	
Ready	

Buttons at the bottom of the dialog box include 'Dial', 'Cancel', and 'Help'.

Literature

1. **Berger Hans, Automating with Simatic, Controllers, Software, Programming, Data communication, Operator Control and Process Monitoring**
2. **SIMATIC Configuring Hardware and Communication Connections with STEP 7, Manual, A5E00706939-01, SIEMENS Edition 03/2006.**