Training Document for Comprehensive Automation Solutions

Totally Integrated Automation (TIA)

MODUL E04

PROFINET

with

IO Controller CPU 315F-2 PN/DP

and

IO Device ET 200S

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The following symbols are used as a guide through Module E04:



1. PREFACE

In terms of its contents, Module E04 is part of the teaching unit entitled '**IT Communication with SIMATIC S7**'.



Learning Objective:

In Module E04, the reader learns how the PROFINET -with the CPU 315F-2PN/DP as IO controller and the ET 200S as IO device- is started up. Module E04 illustrates the method in principle, using a short example.

Prerequisites:

To successfully work through Module E04, the following knowledge is assumed:

- Knowledge in handling Windows
- Fundamentals of PLC programming with STEP 7 (for example, Module A3 'Startup' PLC Programming with STEP 7)
- Fundamentals of network engineering (for example, Appendix V Basics of Network Engineering)

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Hardware and software required

- 1 PC, operating system Windows 2000 Professional starting with SP4/XP Professional starting with SP1/Server 2003 with 600MHz and 512RAM, free hard disk storage 650 to 900 MB, MS Internet Explorer 6.0 and network card
- 2 Software STEP7 V 5.4
- **3** PLC SIMATIC S7-300 with the CPU 315F-2 PN/DP Sample configuration:
 - Power supply: PS 307 2A
 - CPU: CPU 315F-2 PN/DP
- 4 Distributed periphery ET 200S for PROFINET with 2 digital inputs and 4 digital outputs Sample Configuration:
 - Interface Module IM151-3 PN HIGH FEATURE
 - Power module PM-E DC 24V ...48V/AC 24V...230V
 - Electronic module: 2DI Standard DC 24V
 - Electronic module: 4DO Standard DC 24V/0.5A
- 6 Ethernet connection between PC, CPU 315F-2 PN/DP and ET200S with IM 151-3 PN



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2. NOTES ON USING THE CPU 315F-2 PN/DP

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The CPU 315F-2 PN/DP is a CPU that is shipped with two integrated interfaces.
The first interface is a combined MPI/PROFIBUS-DP interface that can be used on the DDOFIDUS DD as master as along for appreciate distributed parisher. *(field devices with vield devi*

PROFIBUS DP as master or slave for connecting distributed periphery/field devices with very fast response timing.

In addition, the CPU can be programmed here by means of MPI or also PROFIBUS DP

- The second interface is an integrated PROFINET interface.
 It allows for using the CPU as A PROFINET IO controller for operating distributed periphery on PROFINET. The CPU can also be programmed using this interface!
- Fault-tolerant periphery devices can also be used on both interfaces.

Notes:

- In Module E04, the CPU 315F-2 PN/DP is used on the PROFINET as IO controller.
- To run this CPU, a Micro Memory Card is required!
- The addresses for input and output modules can be parameterized at this CPU.

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3. NOTES ON USING THE ET200S WITH THE IM 151-3 PN HF



The SIMATIC ET 200S is a decentral IO device configured in a highly modular mode. It can be operated with different interface modules:

IM 151-1 BASIC, IM 151-1 STANDARD and **IM 151-1 FO STANDARD** for connecting a maximum of 63 IO modules (all types except PROFIsafe) to the PROFIBUS DP; alternatively, bus connection with RS 485 Sub-D connector or by means of an integrated fiber-optic connection

IM 151-1 HIGH FEATURE for connecting a maximum of 63 IO modules (all types, including clocked mode for PROFIsafe) to PROFIBUS DP; bus connection with RS485 Sub-D connector

IM 151-3 PN for connecting a maximum of 63 IO modules (all types, including the clocked mode for PROFIsafe) to PROFINET IO controllers; bus connection by means of RJ45 connector

IM 153 PN HF (HIGH FEATURE) for connecting a maximum of 63 IO modules (all types; including the clocked mode for PROFIsafe) to PROFINET IO controllers; bus connection with 2 x RJ45 connector

IM 151-7/F-CPU, IM 151-7/CPU or **IM 151-7/CPU FO** for connecting a maximum of 63 IO modules (all types; PROFIsafe only with IM151-7/F CPU) to PROFIBUS DP; alternatively bus connection with RS 485 Sub-D connector or by means of an integrated fiber-optic connection; with integrated CPU 314 of the SIMATIC S7-300, for preprocessing process data.

The following IO modules can be used:

Power modules for individual grouping of load and encoder supply voltages and their monitoring

Digital electronic modules for connecting digital sensors and actuators

Analog electronic modules for connecting analog sensors and actuators

Sensor module for connecting IQ sense sensors

Technology modules Electronic modules with integrated technological functions, such as counting, positioning, data exchange, etc.

Frequency converters and motor starter modules

For training purposes, an integrated system is provided, suitable for teaching many technologies

Notes:

- In Module E04, the interface module IM151-3 PN HF is used as PROFINET IO device.
- A micro memory card is required for running the IM151-3 PN HF!

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4. STARTING UP THE PROFINET (IO CONTROLLER CPU 315F-2 PN/DP/IO DEVICE ET200S)



Below, the startup of a PROFINET network with the CPU 315F-2 PN/DP as IO controller and the ET200S as IO device is described.

To test the configuration, a program is written. In this program, an indicator lamp P1 is activated when two buttons, S0 and S1, are operated simultaneously.

Assignment List:

10.0	S0	Button Selection 1
10.1	S1	Button Selection 2
O0.0	P1	Indicator lamp



 The central tool in STEP 7 is the 'SIMATIC Manager'. Here, it is called with a double click. (→ SIMATIC Manager)



 STEP7 programs are managed in projects. We are now setting up such a project. (→ File → New)

SIMATIC Manager		-0
Datei Zielsystem Ansicht Extras Fenster Hilfe		
Neu	Ctrl+N	
Assistent 'Neues Projekt'		
Öffnen	Ctrl+O	
S7-Memory Card	•	
Memory Card-Datei	•	
Löschen		
Reorganisieren		
Verwalten		
Archivieren		
Dearchivieren		
Seite einrichten		
1 PROFIsafe02 (Projekt) F:\0_57_Projekte\PROFIs_2		
2 Profi Umrichter (Projekt) F:\0_S7_Projekte\Profi_Um		
3 Erreichbare Teilnehmer PROFIBUS		
Beenden	Alt+F4	
stellt ein neues. Projekt oder eine neue Bibliothek.		

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3. Now, the project is assigned the 'Name' 'ET200S_PN' (\rightarrow ET200S_PN \rightarrow OK)

Name	Abiageptiau
PROFIsate	02 F:\0_S7_Projekte\PR0FIs_2
In aktuelles	Yultiprojekt einfügen. Typ:
In aktuelles ame: T2005_PN	Aultiprojekt einfügen. Typ: Projekt
In aktuelles ame: T2005_PN blageort (Pfad)	Aultiprojekt einfügen. Typ: Projekt F-Bibliothek

4. Highlight your project and insert an 'Industrial Ethernet Subnet'. (\rightarrow ET200S_PN \rightarrow Insert \rightarrow Subnet \rightarrow Industrial Ethernet)

SIMAT	IC Manager	r - [ET2005_PN F:'	\0_57_Projekte\ET2005_I	P]	
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	S7-Software S7-Baustein M7-Software	3 Industrial Ethernet 4 PTP	MPI	29	
		Symboltabelle Textbibliothek Externe Quelle	•		
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i Fügt Induct	rial Ethernet	an der Curcorposition /	ain		

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5. Then a 'SIMATIC 300 Station' is inserted. (\rightarrow Insert \rightarrow Station \rightarrow SIMATIC 300 Station)

SIMAT	(C Manager	- [ET2005_PN F:\	0_57_Projekte\ET2005_P]		
🛃 Datei	Bearbeiten	Einfügen Zielsystem	Ansicht Extras Fenster Hilfe	•	_ 8 ×
	87 🐖 🔤	Station Subnetz	1 SIMATIC 400-Station 2 SIMATIC 300-Station	< Kein Filter >	• 70
ÐEI	200S_PN	Programm 🕨	3 SIMATIC H-Station	Тур	Gri
	S7-Software S7-Baustein M7-Software	4 SIMATIC PC-Station 5 Andere Station 6 SIMATIC 55 7 PG/PC	MPI Industrial Ethernet	25 27	
		Symboltabelle Textbibliothek Externe Quelle			
Fügt SIMATI	(C 300-Statio	n an der Cursorpositior	ein.		<u> </u>

6. With a double click, open the configuration tool 'Hardware'. (\rightarrow Hardware)

🛃 SIMATIC Manager - [ET20	005_PN F:\0_57_P	rojekte\ET2005_P]		
🞒 Datei Bearbeiten Einfüge	n Zielsystem Ansich	t Extras Fenster Hilfe		_ & ×
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🖃 🎒 ET2005_PN	Objektname	Symbolischer Name	Тур	Gri
SIMATIC 300(1)	Hardware		Stationskonfigurati	on
	•			Þ
Drücken Sie F1, um Hilfe zu erhalt	en.		PC Adapter(MPI)	

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	F
H	

7. Open the hardware catalog by clicking on the symbol ¹ (→). (→).
There, arranged in the following directories:
PROFIBUS DP, PROFIBUS PA, PROFINET IO, SIMATIC 300, SIMATIC 400, SIMATIC PC Based Control, and SIMATIC PC Station, all racks, modules and interface modules are provided for configuring your hardware. Insert 'Rail' with a double click. (→ SIMATIC 300 → RACK-300 → Rail)



Drücken Sie F1, um Hilfe zu erhalten.

After that, a configuration table is displayed automatically for configuring Rack 0.

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8. From the hardware catalog, you can now select all modules that are also in your real rack, and insert them in the configuration table.

To this end, click on the name of the respective module, hold the mouse key and drag the module to a line in the configuration table.

We are starting with the power unit '**PS 307 2A**'. (\rightarrow SIMATIC 300 \rightarrow PS-300 \rightarrow PS 307 2A)

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1 PS 2 3 4 5 6 7 2	307 2A							Suchen: nt nt Profit Standard Brofit S
(0) L Steckplatz	IR Baugruppe	Bestellnummer	Firmware	MP	E	A	• •	
1 2 3 4 5 6 7	PS 307 2A	6ES7 307-1BA00-04A0						PS 307 10A PS 307 2A PS 307 5A PS 307 5A RACK-300 SM-300
8 9 10 Drücken Sie F1, un) Hilfe zu erhalten.						_	Laststromversorgung 120/230V AC:24VDC/2A



Note: If your hardware differs from the one displayed here, simply select the corresponding modules from the catalog and insert them in your rack. The order numbers of the individual modules -that are also indicated on the components- are displayed in the footer of the catalog.

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Next, we are dragging the 'CPU 315F-2 PN/DP' to the second slot. The order number and the version of the CPU can be read off the front of the CPU. (→ SIMATIC 300 → CPU-300 → CPU 315F-2 PN/DP → 6ES7 315-2FH10-0AB0 → V2.3)

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4											🖻 🦲 CPU	314 IFM	
5			- 11									314C-2 DP	
6	-											314U-2 PtP 315	
1/8	-		-									315-2 DP	
10	+		-								E CPU	315-2 PN/DP	
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2						-						317-2 PN/DP	
$\frac{3}{4}$						-		-	-			317F-2 217E-2 DN/DE	,
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10. When entering the CPU, the following window appears. In it, assign an '**IP** Address' to the CPU 315F-2 PN/DP, specify the '**Subnet screen form**' and select the '**Ethernet**' network that has already been generated. Optional: for net-overreaching communication, a '**Router** Address' can be selected. Confirm your inputs with '**OK**' (\rightarrow IP Address: 192.168.1.10 \rightarrow Subnet form screen: 255.255.255.0 \rightarrow Ethernet(1) \rightarrow Use Router \rightarrow Address: 192.168.1.1 \rightarrow OK)

Bei Anwahl eines Subnetzes werden die nächsten freien Adressen vorgeschlagen IP-Adresse: 192.168.1.10 Subnetzmaske: 255.255.0 Subnetz: 	Ilgemein Parameter	
P-Adresse: 192.168.1.10 Subnetzmaske: 255.255.0 Subnetz : 		Bei Anwahl eines Subnetzes werden die nächsten freien Adressen vorgeschlagen
Subnetz: nicht vernetzt Ethernet(1) Eigenschaften Löschen	IP-Adresse: 192.168. Subnetzmaske: 255.255.	1.10 Netzübergang C Keinen Router verwenden 255.0 Image: Router verwenden Adresse: 192.168.1.1
Eigenschaften	Subnetz: nicht vernetzt Ethernet(1)	Neu
Löschen	enono(r)	Eigenschaften
		Löschen

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Notes on networking on the Ethernet (additional information in Appendix V of the Training Document):

MAC Address:

The MAC address consists of 2 parts: a fixed and a variable part. The fixed part ("Basic MAC address") indicates the manufacturer (Siemens, 3COM, ...). The variable part of the MAC address differentiates the various Ethernet stations, and should be assigned unique world-wide. On each module, a MAC address assigned by the factory is imprinted.

Value range for the IO address:

The IP address consists of 4 decimal numbers from the value range 0 to 255. They are separated by a period; for example, 141.80.0.16

Value range of the subnet screen form:

This screen form is used for recognizing whether a station or its IP address is part of the local subnet, or whether it can only be accessed by means of a router.

The subnet screen consists of 4 decimal numbers from the value range 0 to 255, separated by a period; for example: 255.255.0.0

In binary representation, the 4 decimal numbers of the subnet screen form have to contain, from the left, a series of gapless values "1" and from the right, a series of gapless values "0".

The values "1" determine the area of the IP address for the network number. The values "0" determine the area of the IP address for the station address.

Example:

 Correct values:
 255.255.0.0 Decimal = 1111 1111.1111 1111.0000 0000.0000 0000 binary

 255.255.128.0 Decimal = 1111 1111.1111 1111.0000 0000.0000 0000 binary

 255.254.0.0 Decimal = 1111 1111.1111 1110.0000 0000.0000 binary

 Incorrect value:
 255.255.1.0 Decimal = 1111 1111.1111 1111.0000 0000.0000 binary

Value range for the address of the network transition (Router):

The address consists of 4 decimal numbers from the value range 0 to 255, separated by a period; for example, 141.80.0.1.

The relationship of IP addresses, router address and the subnet screen form:

The IP address and the address of the network transition may differ only at those positions where there is an "0" in the subnet screen form.

Example:

You entered: for subnet screen form 255.255.255.0; for IP address 141.30.0.5 and for the router address 141.30.128.1.

The IP address and the address of the network transition may have a different value only in the 4th decimal number. In the example, however, the 3rd position is already different.

In the example, you have to change alternatively:

- the subnet screen form to: 255.255.0.0 or

- the IP address to: 141.30.128.5 or

- the address of the network transition to: 141.30.0.1

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11. After you have made the network settings, a bar appears on the right of the CPU315-2 PN/DP, the 'PROFINET IO System', where you can arrange PROFINET IO devices. This is done by clicking on the desired module (here 'ET 200S' with 'IM151-3PN HF') in the hardware catalog in the path 'PROFINET IO' and dragging it to the 'PROFINET IO System'. (→ PROFINET IO → I/O → ET 200S → IM151-3PN HF)



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12. By double clicking on 'IM151-3 PNHF', its properties are opened. (\rightarrow IM151-3 PNHF)

HW Konfig - [SIMATIC 300(1) (Konfigur 	ation) ET2005_PN] Ansicht Extras Fenster I	Hilfe				× &×
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0 UR 1 PS 307:- 2 DCPU 31 X7 MR/DF X2 PN/IO 3 4 5 c 1 UI IM151:2PNHE	Ethernet(1): PROFINET	10-System (100)		Adressen	► ►	Image: Sucher: Image: Standard Profit Standard Image: Standard Image: Standard Image: Standard Image: Standard Image: Standard Image: Standard
Steckplatz Baugruppe 0 JM151.3PMHF 1 2 3 4 5 6 7 8 9 10 10 11	Bestellnummer 6E.S.7.151-384.20-04.80	E-Adresse	A-Adresse	Diagnos 2044*		⊕ GSD ⊕ IM151-3 PN ⊕ Mathbergang ⊕ Sensors ₩ Weitere FELDGERÄTE ⊕ SIMATIC 300 ⊕ SIMATIC 400 ♥ SIMATIC 400 ♥ BSA20-0ABD PROFINCT ID-Device Interfacemodul IM 151-3 PN HF (ERTEC200) für ET 2005 Elektronikmodule, unterstützt Packen

13. Each IO device has to be assigned a '**Device name**' that is unique within the PROFINET IO system and an IP address on the '**Ethernet**'. (\rightarrow Device name: IM151-3PNHF \rightarrow Ethernet)

enschaften - IM151	l-3PNHF		2
Allgemein 10-Zyklus			
Kurzbezeichnung:	IM151-3PNHF		
	PROFINET IO-Device Int Elektronikmodule, unterst	erfacemodul IM 151-3 PN HF (ERTEC200) fü utzt Packen	ir ET 2005 🔺
Bestell-Nr:	6ES7 151-38A20-0AB0		
Familie:	ET200S		
Gerätename:	IM151-3PNHF		
- Teilnehmer / PN-IO	System		
Gerätenummer:	1	PROFINET-IO-System (100)	_
IP-Adresse:	192.168.1.11	Ethernet	
☑ IP-Adresse durc	h 10 -Controller zuweisen		
Kommentar:			
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OK		Abbrechen	Hilfe

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14. After the '**IP Address**' was assigned, it has to be accepted with '**OK**'. (\rightarrow IP Address: 192.168.1.11 \rightarrow OK \rightarrow OK)

<pre>Curzbezeic Eige</pre>	chnung: IM1 enschaften - Eth	151-3PNHF hernet Schnittstelle	IM151-3PNHF			l
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15. From the hardware catalog, you can now select all additional modules that are inserted in your real ET200S and add them to your configuration table. To this end, click on the name of the respective module, hold the mouse key, and drag the module to a line in the configuration table. We are starting with the power module 'PM-E DC24V...48V/AC24...230V' by dragging it to Slot 1. (→ PROFINET IO → I/O → ET 200S → IM151-3 PN HF → PM → PM-E DC24V...48V/AC24...230V)



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16. Next, we are dragging the digital input module '2DI DC24V ST' to the second slot. The order number and the version can be read from the module. (→ PROFINET IO → I/O → ET 200S → IM151-3 PN HF → DI → 2DI DC 24V ST)

HW Konfig - [SIMATIC 300(1) (Konfig Image: Station Bearbeiten Einfügen Zielsyst	uration) ET2005_PN] em Ansicht Extras Fenster	Hilfe					×
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(1) IM151-3PNHF Steckplatz Baugruppe 2 M/157/3PNH/F 1 PM-E DC24/48V/AC24/ 2 DI DC24V ST 3 4 5 6 7 8 9 10 11	Bestellnummer <i>6E S7 151-384,20,0480</i> 236 6E S7 138-4CB10-0AB0 6E S7 131-48801-0AA0	E-Adresse	A-Adresse	Adressen p Diagnos 23044* 2043*	acken	Imit 51-3 PN Hr	Ĩ

17. Then, we drag the digital output module '4 DO DC 24V/0.5A ST' to the 3rd slot. The order number and the version can be read from the module. (\rightarrow PROFINET IO \rightarrow I/O \rightarrow ET 200S \rightarrow IM151-3 PN HF \rightarrow DO \rightarrow 4 DO DC 24V/0.5A ST)



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18. Now, the addresses of the inputs and outputs in the ET 200S can be changed. This is done by double clicking on the corresponding input or output submodules in the ET 200S and setting them under the tab 'Addresses'. These addresses should be noted down for each case. Addresses are assigned automatically in the sequence in which the submodules are entered. (→ 4DO DC 24V/0.5A ST → Addresses → OK)



19. By clicking on ' $[\mathbb{F}_{1}]$, the configuration table is saved and compiled (\rightarrow $[\mathbb{F}_{1}]$)

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	IM151-3PNHF				Adressen <u>p</u> a	.▼ cken	÷		200 DC24V/05A ST 200 DC24V/05A ST 200 DC24V/2A HF 200 DC24V/2A HF 200 DC24V/2A ST 200 DC24V/2A ST 2R0 N0 DC24.120V/ 2R0 N0 DC24.120V/
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2	101/3/3/Whit			3	2043×				4 F-D0 DC24V/2A
7	PM-E DC24/48V/ AC24/2	2306ES7138-4CB10-0AB0			12040		1.12.01		
7	PM-E DC24/48V/ AC24/2 2DI DC24V ST	230 6ES7 138-4CB10-0AB0 6ES7 131-4BB01-0AA0	0.00.1		2045				4D0 DC24V/0.5A ST
7	PM-E DC24/48V/ AC24/2 2DI DC24V ST 4D0 DC24V/05A ST	230 6ES7 138-4CB10-0AB0 6ES7 131-4BB01-0AA0 6ES7 132-4BD01-0AA0	0.00.1	0.00.3	2043				4D0 DC24V/0,5A ST 4D0 DC24V/0,5A ST
7	PM-E DC24/48V/ AC24/2 PM-E DC24/48V/ AC24/2 20I DC24V ST 4D0 DC24V/0,5A ST	2306ES7138-4CB10-0AB0 6ES7131-4B801-0AA0 6ES7132-4BD01-0AA0	0.00.1	0.00.3	2045				4D0 DC24V/0,5A ST 4D0 DC24V/0,5A ST 4D0 DC24V/2A ST
	PM-5/3-979/7 PM-E DC24/48V/AC24/2 2DLDC24V ST 4D0 DC24V/0,5A ST	230 6ES7 138-4CB10-0A80 6ES7 131-4B801-0AA0 6ES7 132-4BD01-0AA0	0.00.1	0.00.3					4D0 DC24V/0,5A ST 4D0 DC24V/0,5A ST 4D0 DC24V/2A ST 4D0 DC24V/2A ST
7	M/3/3/97W// PM-E DC24/48V/ AC24/2 201 DC24/48V/ AC24/2 4D0 DC24//0.5A ST	230 6ES7 138-4CB10-0AB0 6ES7 131-4B801-0AA0 6ES7 132-4BD01-0AA0	0.00.1	0.00.3					4D0 DC24V/0,5A ST 4D0 DC24V/0,5A ST 4D0 DC24V/2A ST 4D0 DC24V/2A ST 4D0 DC24V/2A ST
7	PM-DC24/48//AC24/2 PM-E0C24/48//AC24/2 2DIDC24/48//AC24/2 4D0DC24V/0,5AST	230 6ES7 138-4CB10-0AB0 6ES7 131-4B001-0AA0 6ES7 132-4BD01-0AA0	0.00.1	0.00.3					4D0 DC24V/0.5A ST 4D0 DC24V/0.5A ST 4D0 DC24V/2A ST 4D0 DC24V/2A ST 4D0 DC24V/2A ST
	PM-EDC24/48// AC24/2 PM-EDC24/48// AC24/2 2DLDC24/48// AC24/2 4DD DC24//0.5A ST	23(EES7138-4CB10-0AB0 EES7131-4B801-0AA0 EES7132-4BD01-0AA0	0.00.1	0.00.3				B	4D0 DC24V/0,5A ST 4D0 DC24V/0,5A ST 4D0 DC24V/2A ST 4D0 DC24V/2A ST 4D0 DC24V/2A ST
	(M23/37/07/07 (PME DC24/49//AC24/2 (20) DC24/ ST (20) DC24/ ST (400 DC24//0.54 ST	230(6E57138-4CB10-0A80 6E57131-48801-0AA0 6E57132-48D01-0AA0	0.00.1	0.00.3			Image: A state of the state	B	4D0 DC24V/0,5A ST 4D0 DC24V/0,5A ST 4D0 DC24V/2A ST 4D0 DC24V/2A ST 4 4D0 DC24V/2A ST 4 4 4 4 4 4 4 4 4 4 4 4 4

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20. Now, highlight the IO device and assign it a name 'Assign device name'. (\rightarrow IM151-3PNHF \rightarrow PLC \rightarrow Ethernet \rightarrow Assign device name)





Note: A precondition for this is that the PG/PC interface is set to TCP/IP, and the network card of the PC is correctly configured. For example: IP address 192.168.1.99, Subnet 255.255.255.0 and router address 192.168.1.1. (refer to Module E02).



Note: Make sure your programming device is connected to the ET200S via the Ethernet.

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<u></u>

21. We now select the ET200S to assign the name 'Assign name'. (\rightarrow ET200S \rightarrow Assign name)

rätenamen	ı vergeben			
àerätename:	IM151-3PNHF	Gerätetyp:	ET 2005	
/orhandene G	Geräte:			
IP-Adresse	MAC-Adresse	Gerätetyp Gerätename		Name zuweisen
				Teilnehmer-Blinktest Dauer (Sekunden): 3 💽 Blinken ein Blinken aus
nur Geräte Aktualisi	e gleichen Typs anze erenExp	gen 🗖 nur Geräte ohne ortieren	Namen anzeigen	
Schließen]			Hilfe



Note: If several IO devices are on the network, the device can be identified using the imprinted MAC address.

22. The new device name is then displayed in the area 'Available devices'. 'Close' the dialog. (→ Close)

eratename:	IM151-3PNHF	-	Gerätetyp:	ET 2005	
rhandene (aerate:				
P-Adresse	MAC-Adresse	Gerätetyp	Gerätename		Name zuweisen
					Teilnehmer-Blinktest Dauer (Sekunden): 3 Blinken ein Blinken aus

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23. Clicking on ' $\overset{()}{\underline{m}}$ ' loads the configuration table to the PLC. The operating mode switch on the CPU should be on Stop! (\rightarrow)

🖳 HW Konfig - [5IMATIC 300(1) (Konfig	uration) ET2005_PN]						
III Station Bear	beiten Einfügen Zielsyste	em Ansicht Extras Fenster	Hilfe					. 8 ×
0 🕞 🔓 🖬	R 6 6 6	🛍 🋍 🗈 🔡 K?						
(0) UR 1 PS 2 CP X7 M# X2 PA 3 4 5 c	307 : A U 31 7/0F 40 	Laden in Baugruppe	10-System (100)		Adressen n	A P arken	Sucher: Profit Standard PROFIBUS-DP PROFIBUS-PA PROFIDUS-PA PROFINET IO SIMATIC 300 SIMATIC 400 SIMATIC 400 SIMATIC PD Based Control 300/400 SIMATIC PD Station	- 0x ht mi -
Steckplatz	Baugruppe	Bestellnummer	E-Adresse	A-Adresse	Diagnos	K		
	M/37-3FWHF	6257 757-388204860			2042*	-		
2	2010C24/46V/AC24/2	6ES7 131-4BB01-0660	0.0.01		2045			
3 4 5	4D0 DC24V/0,5A ST	6ES7 132-48D01-0AA0	0.00.1	0.00.3	2			
6 7 8 9							PROFINET ID-System	- _t
Lädt aktuelle Statio	n in Ladespeicher der aktuel	len Baugruppe.		-		Ŧ		



Note: Make sure your programming device is connected to the CPU via the Ethernet.

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24. The CPU 315F-2 PN/DP is confirmed a destination module of the loading process. (\rightarrow OK)

augruppe	Träg	er Steckplatz
PU 315F-2 PN/DP	0	2
ulles markieren		

25. In the dialog below, you can have the connected devices in the network '**Display**'(ed). (→ Display)

Über welche Teilnehmeradresse ist das PG mit der Baugruppe CPU 315F-2 PN/DP verbunden? Baugruppenträger: 		e auswählen			
Baugruppenträger: 0 == Steckplatz: 2 == Steckp	Über welche Teilne	hmeradresse ist das Pl	G mit der Baugruppe CF	PU 315F-2 PN/DI	P verbunden?
Steckplatz: 2 = Zielstation: © Lokal © Über Netzübergang zu erreichen Anschluß an Zielstation eingeben: IP-Adresse MAC-Adresse Baugruppentyp Stationsname CPU-Name 192.168.1.10	Baugruppenträger:	0 -			
Cielstation: C Lokal C Über Netzübergang zu erreichen Anschluß an Zielstation eingeben: IP-Adresse MAC-Adresse Baugruppentyp Stationsname CPU-Name 192.168.1.10	iteckplatz:	2 =			
Über Netzübergang zu erreichen Anschluß an Zielstation eingeben: IP-Adresse MAC-Adresse Baugruppentyp Stationsname CPU-Name 192.168.1.10	Zielstation:	🕼 Lokal			
Anschluß an Zielstation eingeben: IP-Adresse MAC-Adresse Baugruppentyp Stationsname CPU-Name 192.168.1.10		C Über Netzüberg	ang zu erreichen		
IP-Adresse MAC-Adresse Baugruppentyp Stationsname CPU-Name 192.168.1.10	Anschluß an Ziels	station eingeben:			
192.168.1.10	IP-Adresse	MAC-Adresse	Baugruppentyp	Stationsname	CPU-Name
	192.168.1.10				
	<u>.</u>				
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Anzeigen	٩]		Anzeigen		Þ

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26. Then, the CPU's MAC address in the Ethernet is selected. If you are connected to only one CPU, accept with '**OK**'. (→ OK)

Baugruppenträger:				
Steckplatz:	2 🚊			
Zielstation:	🖲 Lokal			
	C Über Netzübergang	j zu erreichen		
Anschluß an Zielst	tation eingeben:			
IP-Adresse	MAC-Adresse	Baugruppentyp	Stationsname	CPU-Name
		the second se		
•	08-00-06-6B-A2-D8	57-300	Î)
✓ I	08-00-06-68-A2-D8 mer: 08-00-06-68-A2-D8	57-300 S7-300)
<	08-00-06-68-A2-D8 mer: 08-00-06-68-A2-D8	\$7-300 \$7-300		þ
∢ irreichbare Teilnehn	08-00-06-68-A2-D8 mer: 08-00-06-68-A2-D8	\$7-300 \$7-300		
< trreichbare Teilnehr	08-00-06-68-A2-D8	\$7-300 \$7-300		2



Note:

If several IO controllers are on the network, the device can be identified with the imprinted MAC address.



27. Now, the correct IP address has to be assigned to the IO controller if it has not been set correctly yet. Confirm the following dialog with 'Yes'. (\rightarrow Yes)



<<The selected station does not have an IP address. Do you want to assign the address 192.168.1.10 now?>>

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28. After you loaded the hardware configuration, you can start creating the program. From the 'SIMATIC Manager', select the block 'OB1' with a double click. (\rightarrow OB1)

SIMATIC Manager - [ET2005_PN	F:\0_57_Projekte\ET	2005_P]	
🞒 Datei Bearbeiten Einfügen Zielsyst	em Ansicht Extras f	Fenster Hilfe	_ & ×
		🗄 🔝 💽 🛛 Kein Filter >	• 70
ET200S_PN SIMATIC 300(1) CPU 315F-2 PN/DP S7-Programm(1) Quellen Bausteine	Objektname Systemdaten OB1	Symbolischer Name 	Erstellsprache
Drücken Sie F1, um Hilfe zu erhalten.		TCP/IP -> R	ealtek RTL8139/810×1

29. Select the 'Programming language FBD' and accept with 'OK'. (\rightarrow FBD \rightarrow OK)

Eigenschaften - Organis	ationsbaustein		×
Allgemein - Teil 1 Allgen	nein - Teil 2 Aufrufe Attribute	8	
Name:	0B1		
Symbolischer Name:			
Symbolkommentar:			
Erstellsprache:	FUP		
Projektpfad:			
Speicherort des Projekts	F:\0_S7_Projekte\ET200S_P	č.	
Erstellt am:	Code 03.01.2006 11:02:03	Schnittstelle	
Zuletzt geändert am:	03.01.2006 11:02:03	03.01.2006 11:02:03	
Kommentar:			*
OK		AbbrechenHi	ilfe

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30. With 'LAD, STL, FBD - Program S7 blocks', you now have an editor with which you can generate your STEP7 program accordingly. To this end, OB1 has already been opened with the first network. To generate your initial operations, highlight the first network. Now you can write your first STEP7 program. In STEP7, individual programs are usually arranged in networks. A

new network is opened by clicking on the network symbol The STEP7 program that is to be tested can now be loaded.

In our case, this is only OB1. Save OB1 'B' and click on Load ' i. The CPU's key switch should be on STOP! (\rightarrow H, sin -

KOP/AWL/FUP - [OB1 ET2005_PN\SIMATIC 300(1)\CPU 315F-2 PN/DP]			×
🕞 Datei Bearbeiten Einfügen Zielsystem Test Ansicht Extras Fenster Hilfe		_ 8	×
	HHO [8	IDICE CH M	
Inhalt von: 'UngeLadenSchnittstelle'		<u> _</u>	×
= 5 % «nhnit+ et alla 📰 Name		have a second seco	
OB1 : Titel:		E 🛞 Bitverknüpfung	
Kommentar:		🗄 <u> </u> Vergleicher 🗄 🍓 Umwandler	
Netzwerk 1/: Titel:		E - En Zähler F - Ima DB-Aufruf	
Kommentar:		E G Sprünge	
	_ []	Erestpunkt-Fkt. Erestpunkt-Fkt.	
8		🗄 🔂 Verschieben	
B0.0 - A0.0		Programmsteuerung Schieben/Potieren	
B0.1-	Ē		
	E	🗄 🔞 Zeiten	
		Wortverknuprung FB Bausteine	
		FC Bausteine	
		SFB Bausteine	
		± <u><</u>	
•	J []	Programmeleme	ſ
	E 01		
The rehier A 2: Into A 3: Querverweise A 4: Uperandeninto A	5: Steu	ern A 5: Diagnose A 7: Vergleic	<u>n</u>
Lädt aktuellen Baustein in Zielsystem. 🛛 😨 offline	Abs	< 5.2 Nw 1 Einfg	11.

31. By setting the operating mode switch to RUN, the program is started. By clicking on the symbol 60 for monitoring, the program can be monitored in 'OB1'.



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Note: Make sure the CPU is connected to the ET200S via the Ethernet.

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