

**PROFIBUS DP Configurator  
for CRP 811  
Typ: 332 SPU 931 01  
(incl. Modsoft and SPU832 Parts)  
Version 3.10**

**User instructions**  
DOK-33000 244.01-0898 / 840 USE 469 00

Accompanying software packages 332 SPU 833 01



## Overview

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# **General Information Contents**





## Notes

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### Application Note



**Caution** The relevant regulations must be observed for control applications involving safety requirements.

For reasons of safety and to ensure compliance with documented system data, repairs to components should be performed only by the manufacturer.

### Data, Illustrations, Alterations

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# Terminology

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**Note** This symbol emphasizes very important facts.



**Caution** This symbol refers to frequently appearing error sources.



**Warning** This symbol points to sources of danger that may cause financial and health damages or may have other aggravating consequences.



**Expert** This symbol is used when a more detailed information is given, which is intended exclusively for experts (special training required). Skipping this information does not interfere with understanding the publication and does not restrict standard application of the product.



**Path** This symbol identifies the use of paths in software menus.

Figures are given in the spelling corresponding to international practice and approved by SI (Système International d' Unités).

I.e. a space between the thousands and the usage of a decimal point (e.g.: 12 345.67).




## Objectives

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### List of Abbreviations

<b>AWP</b>	User Program
<b>BP</b>	Backplane (Quantum)
<b>C</b>	Client
<b>CCMP</b>	Coordination Channel Manager (profile specific module)
<b>CIM</b>	Computer Integrated Manufacturing
<b>CPU</b>	Central Processing Unit
<b>CRP 811</b>	PROFIBUS-DP-Modul for TSX Quantum
<b>DDB</b>	Device Data Base = GSD (German)
<b>DP</b>	Decentralized Peripherals
<b>DPM</b>	DP-Master (PROFIBUS-DP) or Dual Ported Memory
<b>DDL</b>	Direct Data Link Mapper (PROFIBUS-DP)
<b>IEC</b>	International Electronic Committee
<b>IEEE</b>	Institute of Electric and Electronic Engineers
<b>IF</b>	Interface
<b>GSD</b>	"Geräte Stamm Dateien" (German)=>see DDB
<b>HSA</b>	Highest station address
<b>I/O</b>	Input/Output
<b>IS</b>	International Standard




<b>ISO</b>	International Standardization Organization
<b>MAP</b>	Manufacturing Automation Protocol
<b>MB+</b>	Modbus+
<b>MMS</b>	Manufacturing Message Specification
<b>MMSE</b>	MMS over Ethernet
<b>NHP 811</b>	PROFIBUS-DP-Module for PC and for CRP 811, PCMCIA-Board
<b>OSI</b>	Open System Interconnection
<b>PBS</b>	PROFIBUS connector
<b>PLC</b>	Programmable Logical Control
<b>PNO</b>	PROFIBUS User Organisation e.V.
<b>PROFIBUS</b>	Process Fieldbus
<b>PUTE, (PDT)</b>	Program- and Test-Equipment
<b>Quantum</b>	Product name for Modicon PLC
<b>RS 485</b>	PROFIBUS-Interface for Modicon PLC (Recommended Standard for a Communication Interface)
<b>TIO</b>	Terminal I/O (decentrale node at PROFIBUS DP)

## **Arrangement of This Guide**

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This documentation is written for users, who want to configure and parameterize the CRP811 module for the PROFIBUS–DP communication with DP slaves.



Abbreviations, different functions and configuration modes will be explained in this documentation.

## **Related Documents**

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Modicon Ladder Logic  
Block Library, User Guide  
Mod. No.: 840 USE 101 00

Modicon Quantum Automation Series Hardware  
Reference Guide  
Mod.No.: 840 USE 100 00

Installationsrichtlinien der PROFIBUS Nutzerorganisation  
Mod. No.: 2.111  
PROFIBUS Nutzerorganisation e.V.  
Haid- und Neu-Straße 7  
D 76131 Karlsruhe

Modicon TSX Momentum  
E/A-Einheiten, Benutzerhandbuch  
Mod. No.: 870 USE 002 02

TSX Momentum  
Bus-Adapter Profibus DP, Benutzerhandbuch  
Mod No.: 870 USE 004 02

EN 50170 Fieldbus Part 2  
DIN 19249 Part 1 and 3

DEA 203 im Profibus DP Handbuch 27 00

## Validity Note

The following tables contain the relationships between Modsoft and the necessary software and firmware:

Required Mod-soft/Exec		At Modsoft V 2.32	At Modsoft V 2.4	At Modsoft >=V 2.51	At Modsoft >=V 2.61
Unit	Module	FW / SW	FW / SW	FW / SW	FW / SW
Exec	CPU x13	V2.00 Q186V200.bin	V2.11 Q186V211.bin	V2.14 (>= 2.11) Q186V214.bin	V2.20 Q186V220.bin
	CPU 424	V2.00 Q486V200.bin	V2.11 Q486V211.bin	V2.12 Q486V212.bin	V2.18 Q486V218.bin
	CPU 434 CPU 534	—	—	—	V1.05 Q58V105b.bin

For DP-Configura-tion:		At Modsoft V 2.32	At Modsoft V 2.4	At Modsoft >=V 2.51	At Modsoft >=V 2.61
Unit	Module	FW / SW	FW / SW	FW / SW	FW / SW
140 CRP 811 00	CRP 811	V1.11D	V2.04D V3.00D	>=V3.00D	>=V4.10D
	NHP811	V5.01A	V5.02E	> =V5.02I	> =V5.02I
332 SPU 833 01	SPU 931	V1.10	V2.00	>=V3.00	>=V3.10
	GSD 931	V1.10	V2.00	>=V3.00 (GSD 831)	>=V4.00 (GSD 831)
	SPU 832 (KON-DP)	V1.2 (EN / DE)	V1.4 (EN / DE)	>=V1.60 (with Dongle)	>=V1.60 (with Dongle)



# Handling 3 1/2" Diskettes

No cleaning of diskettes.

Store diskettes in protective containers and boxes.

Temperature 10 to 60°C  
Humidity 8 to 80%

Insert diskettes correctly.

No water on diskettes.

No heavy objects on diskettes.

No erasing on diskettes.

Diskettes tolerate no heat (sunshine).

Label diskettes at the right spot.

Don't move the metal slide.

No diskettes near magnetic fields.

No forcing diskettes into disk drive.

Always keep in mind





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# **Part I**

## **Getting started and Installation**

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# Chapter 1

## Getting Started

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This section will describe the configuration environment and the complete configuration process.

## 1.1 General Information

The goal of this documentation is to describe the SPU931 software package configuration steps in detail. But since this is not really possible without concise knowledge of the network environments, this and the interaction between the various software packages will be described.

### 1.1.1 DP Configuration

The description is based on the simplest case of a plant configuration consisting of a Quantum PLC and various SAD-I/O modules from the TIO series. These components are linked over an appropriate bus cable and a CRP 811 network option board with the Quantum PLC. An exchange of pure I/O data takes place over this connection, whereby the Quantum (CRP 811) is always characterized in the course of the configuration as the master, and the connected TIOs as slaves.

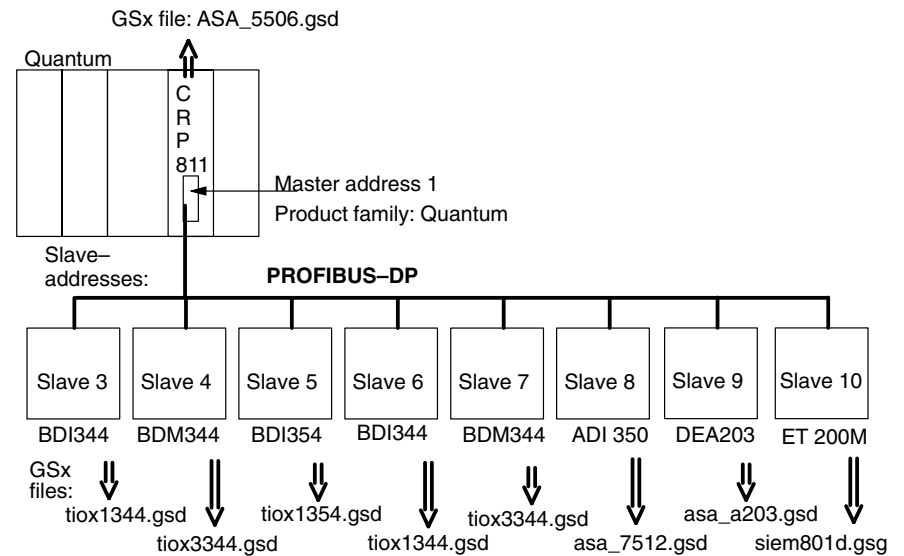


Figure 1 PROFIBUS-DP configuration for the example

Different manufacturer devices can be operated on this bus. A device data set is available and identifies of the differing device types on the bus.

For PROFIBUS–DP this is a device data base (DDB) set. These DDB sets are made available from the respective device manufacturer for each device type in the form of a GSD file.

A station specific Modsoft configuration file (.CFG) will be modified by the SPU931 mapping tool, in being supplemented with addresses and diverse parameters, as well as the number of state ram register ranges required with which the slave I/O signals are reflected. These data sets are also transferred into the PLC when user programs are loaded.

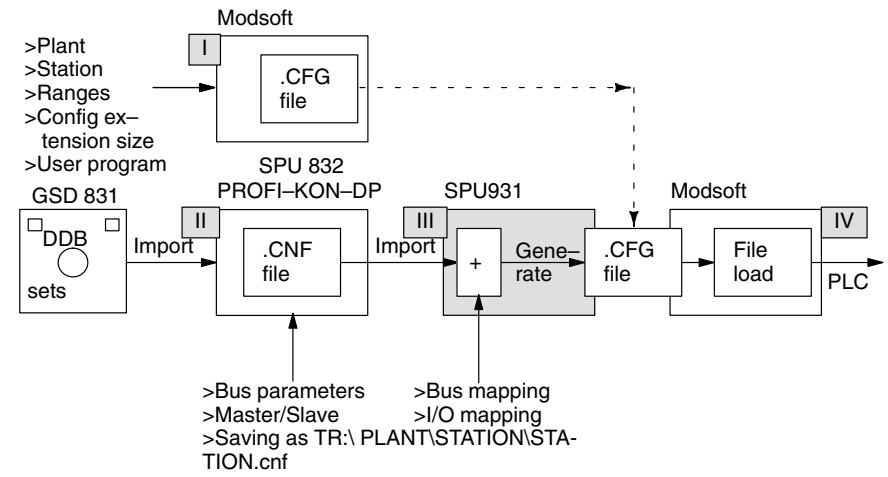
#### 1.1.1.1 DP Software Packages and their Features

Configuration of the DP communication takes place in 4 global steps done using the following sequence.

- Determining the plant and station specific data for the PLC using the **Modsoft** software package, in particular:
  - Plant name (**program name locations**)
  - Station name (**program .....**)
  - The communication parameters (e.g. Modbus 1 or MB+ – required for PLC load)
  - CPU type and surrounding hardware
  - **State ram ranges** (also for the I/O slaves)
  - Addition of the **CRP 811** interface module within the Modsoft I/O map configuration (DP bus)
  - **Config extension size**
  
- Determining any bus specific data using the **PROFI–KON–DP (SPU 832)** software configuration tool, such as:
  - **Import** of device data base sets (**GSD** files)
  - **Master/Slave** parameters
  - Definition and saving of a bus project into the path DR:\PLANT\STATION. DR means drive, PLANT means plant name, STATION means stationname (program).

- I/O and bus mapping (address assignments and topology of the bus and interface modules) using the **SPU 931** configuration software through:
  - **Import** of the bus specific data (originating from the PROFIBUS-DP tool)
  - Assignment of the slave I/O points to PLC state ram register addresses (state ram processing)
  - Assignment of all DP bus line controllers
  
- Initiating communication by using Modsoft:
  - User program load into the PLC
  - Start PLC

The following drawing should help illustrate the relationships of the processing steps.



The fields **I** to **IV** indicate the processing sequence.

**Figure 2 Quantum PROFIBUS-DP processing steps under Modsoft**





# Chapter 2

## Software Tools

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This chapter provides an overview of the installation steps for the required Profibus configuration software tools.

## 2.1 Overview

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### 2.1.1 PROFIBUS-DP

Operation & configuration of Profibus nodes within a PROFIBUS-DP network require both of the following tools in addition to the Modsoft configuration tool. A defined directory structure is rigidly prescribed for all 3 tools. For additional information refer to chapter 3.2.

The required software packages for the "I/O fieldbus" communication are:

- ❑ 332 SPU 832 01 (PROFI\_KON\_DP) for device data base import and master/slave parameter determination.

The software protection requires the presence of a token during program installation and normal program operation.

A supplementary diskette 332 GSD 931 01 containing the device data base is also required.

The program runs under Windows 3.xx and Windows95 and WindowsNT; installation is menu-assisted.

- ❑ 332 SPU 931 01 (abbreviated SPU931) define bus and I/O mapping.

The program runs under Windows 3.xx and Windows 95 (until release V1.4) and WindowsNT (up to release V1.6); installation is menu driven.

## 2.2 Which Programming Panel (Utility PC)?

---

The standard Windows 3.xx prerequisites must be met. Thus a typical PC with at least a 80386 CPU, 4 MB of RAM and on the harddisk a free space of at least 30MByte.

The standard Windows 95 prerequisites must be met. Thus a typical PC with at least a 80486 CPU, 8 MB of RAM and on the harddisk a free space of at least 30MByte.

The standard Windows NT prerequisites must be met. Thus a typical PC with at least a 80586 CPU (Pentium), 32 MB of RAM and on the harddisk a free space of at least 30 MByte.







# Chapter 3

## Installation

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In this chapter the **installation** and **execution** of the software packages

- Modsoft
- SPU832 (PROFI-KON-DP )
- SPU931

are described.

## 3.1 Making a Program Backup Copy

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### 3.1.1 General Information



**Note:** It is highly recommended that, before attempting to produce backup copies, any viruses on the PC should be eliminated first (all recent Operating System versions contain an anti-virus tool).

A complete set of backup diskettes should be made of all the original software package program diskettes **excepting the Token disk**. The necessary number of empty diskettes should be available before starting the actual backup procedure.

The PROFIBUS-DP (332 SPU 833 01) software package contains the following diskette sets:

- 332 SPU 931 01 (DP mapping tool, 3 diskettes)
- 332 GSD 831 01 (DDB files for DP modules, 1 diskette)
- 332 SPU 832 01 (DP bus configuration tool, 1 program diskette and 1 dongle)



**Note:** Make sure all Original diskettes are write protected.

### 3.1.2 Making Backup Copies of the Original Diskettes

Open the "MS-DOS Prompt" icon under the Windows 3.xx or Windows 95 or Windows NT. Process with the copy process as follows:



**Note:** The PROFI-KON-DP (SPU832) software package consists of 1 diskette with the executable configuration software and one dongle (hard lock). To make use of the software the dongle must also be plugged into the LPT 1 port of the PC.

**Step 1** Enter "Diskcopy a: a." and close with <Return>

**Step 2** Follow the on screen instructions.

**Step 3** Continue to answer with "Y" in response to the question "Copy another diskette (Y/N)?" until all of the original diskettes have been copied. Then close the program with a "N" input.



**Note:** Label each of the backup diskettes in accordance with the original diskettes. Store the original diskettes in a secure place safe from destruction.



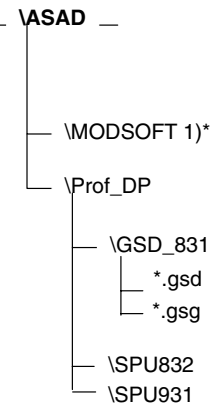
**Note:** Use of PROFI-KON\_DP (SPU832)

## 3.2 Directory Structure for Programs and Data

A **common** directory structure is essential in guaranteeing correct interaction between software packages participating in communications configuration. A common directory structure is also essential for the different stations within a plant's network. This is not essential for the names.

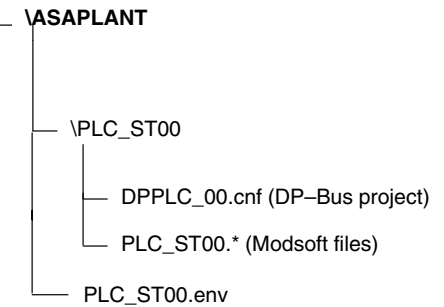
**Program (.exe) directories:**  
(not necessary, but recommended)

Drive: (e.g. E:\)



**Data or plant directories:**  
(necessary for the structure)

Drive: (e.g. F:\)



1)\* The name is determined by the software; all other names are determined by the user.

**Figure 3** Program and data directory structures



**Note:** The plant directory have to be placed in the root directory (e.g. e:\ plant\_name). The station and the program name must have the same name.



## 3.3 Modsoft Installation

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### 3.3.1 Installing Modsoft under MS-DOS

This software is to be installed using **MS-DOS** to the **hard drive** of your utility PC (programming panel). Make use of the previously made **diskette backup copies**.

Proceed with the installation as described in your Modsoft documentation.



**Note:** An example for the installation directory might be: E:\ASAD (also refer to chapter 3.2 )



**Note:** Start with the installation as started in the Modsoft user instructions. The directory named "Modsoft" is created by the software.



**Note:** Once the installation has been completed successfully without an error message, Modsoft can be started from its directory with "modsoft" and no further parameters. For an existing plant directory the invocation might be e.g. "modsoft F:\ASAPLANT" as per chapter 3.2.

### 3.3.2 Installing Modsoft under Windows NT 4.0

Because both the installation and the operation of Modsoft require 4 megabytes of extended memory, shortcuts must be generated that allocate that much memory to each of these. To install Modsoft, you must first generate a shortcut for the installation program. Follow this procedure:

#### 3.3.2.1 \* Modsoft Installation

- Step 1** Insert Disk 1 of Modsoft in your "A" drive.
- Step 2** Right click your mouse on an empty area of your desktop screen.
- Step 3** Click on "New" and then "Shortcut".
- Step 4** Under "Command Line", enter "a:\install.exe" if this is a new installation or "a:\update.exe" if this is an upgrade, and click on "Next" or press Enter.
- Step 5** Under "Select a name for the shortcut", either leave the default or give the shortcut a name of your choice, and then click on "Next" or press Enter.
- Step 6** Under "Select an icon for the shortcut", click on the icon of your choice and then click on "Finish" or press Enter.

You should now have an icon on your desktop screen for installing or updating Modsoft.

- Step 7** Right Click your mouse on the shortcut.
- Step 8** Click on "Properties" to open the properties dialog box.
- Step 9** Click on the "Memory" tab in the properties dialog box.
- Step 10** In the "Conventional Memory" section, under "Total", either enter or choose 640.12.

- Step 11** In the "Expand" (EMS) Memory" section under "Total", either enter or choose 4096 and click on "OK".
- Step 12** The shortcut for the install or update is now complete. Double click on it to start the installation.
- Step 13** Follow the normal procedure for installing or updating Modsoft, including setting up the UPF file.
- Step 14** When the installation is complete you may delete the installation program shortcut.



### 3.3.2.2 \* Modsoft Operation

A new shortcut must be generated for the Modsoft program that allocated the proper amount of memory. To do this, follow this procedure:

- Step 1** Right click your mouse on an empty area of your desktop screen.
- Step 2** Click on "New" and then "Shortcut".
- Step 3** Under "Command Line", enter "modsoft.exe" along with the path (example: "c:\modsoft/modsoft.exe"), and click on "Next" or press Enter.
- Step 4** Under "Select a name for the shortcut", either leave the default or give the shortcut a name of your choice, and then click on "Next" or press Enter.
- Step 5** You should now have an icon on your desktop screen for running Modsoft.
- Step 6** Right click your mouse on the shortcut.
- Step 7** Click on "Properties" to open the properties dialog box.
- Step 8** Click on the "Memory" tab in the properties dialog box.



- Step 9** In the "Conventional Memory" section under "Total", either enter or choose 640.10.
- Step 10** In the "Expanded (EMS) Memory" section under "Total", either enter or choose 4096 and click on "OK".
- Step 11** The shortcut for running Modsoft is now complete. Double click to start Modsoft.

## 3.4 Installation PROFIBUS–DP Diskettes

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### 3.4.1 SPU 832

There is a change regarding copy protection from SPU832 V1.4 to SPU832  $\geq$ V1.60.

- SPU832 V1.60 for Windows 3.xx or Windows 95 or Windows NT:  
Copy protection by a dongle (hard lock).
- SPU832 V1.4 for Windows 3:xx or Windows 95:  
Copy protection by a token diskett.

#### 3.4.1.1 SPU832 $\geq$ V1.60 with dongle

This software is to be installed using **Windows 3.xx or Windows 95 or Windows NT** onto the **hard drive** of your utility PC (programming panel). To use the software after installation the dongle must also be plugged into the LPT1 port of the PC



**Note:** Plug the dongle into the LPT1 connector of the PC.



**Note:** Modsoft must have already been installed.

Proceed with the installation as follows:


- Step 1** Switch on the utility PC and start Windows.
- Step 2** Place the diskette in the **A** floppy drive.
- Step 3** Select File/Run/Browse using the Windows Program Manager or Start/Run for Windows 95/NT to select the installation file.



- Step 4** First select the A: drive and then the "Setup.exe" file, passing it back to the Run window with a click (i.e. A:Setup.exe).
- Step 5** Start the installation with a click of the Run window's OK button.

**3.4.1.2 SPU832 V1.4 with token still in use**


This software is to be installed using **Windows 3.xx or Windows 95** onto the **hard drive** of your utility PC (programming panel). During the installation procedure both the program and the token must be installed to the destination drive.

 **Note:** The token can only be accepted from an original diskette.

 **Note:** Modsoft must have already been installed.

Proceed with the installation as follows:

- Step 1** Switch on the utility PC and start Windows.
- Step 2** Place the diskette in the **A** floppy drive.

 **Note:** Pay attention that there is no write protection. Otherwise an error message will be produced reporting the access denial.

- Step 3** Select File/Run/Browse using the Windows Program Manager or Start/Run for Windows 95 to select the installation file.
- Step 4** First select the A: drive and then the "Setup.exe" file, passing it back to the Run window with a click (i.e. A:Setup.exe).

**Step 5** Start the installation with a click of the Run window's OK button.

**Response** The installation begins. The determination of the directory structure defined in chapter 3.2 should be utilized.



**Note:** An example for the directory specification might be:  
E:\ASAD\PROF\_DP

**Response** After completion of the installation the program can be started by clicking the mouse on the corresponding icon.

### 3.4.2 GSD 831

The DP specific files will be copied to the **hard drive** of your utility PC (programming panel). For utilization they should also be placed into the directory structure. Refer to example illustration in chapter 3.2.

The suggested subdirectory is F:\ASAD\PROF\_DP\GSD\_DP.

Using the File Manager, copy all files from the diskette directories gsd\_dp.crp / .tio into the above named directory. Copy all files for the master (ASA\_5506.gsd) as well as for the slave modules (TIOxxxx.gsd for TIO modules. ASA-a203.gsd for DEA203 modules and ASA\_7512 for Momentum modules)

### 3.4.3 SPU 931

This software is to be installed using **Windows 3.xx or Windows 95 or Windows NT** onto the **hard drive** of your utility PC (programming panel). Make use of the previously made **diskette backup copies**.



**Note:** Modsoft must have already been installed.

Proceed with the installation as follows:



**Step 1** Switch on the utility PC and start Windows.

**Step 2** Place the diskette in the **A** floppy drive.

**Step 3** Select File/Run/Browse using the Windows Program Manager or Start/Run for Windows 95 to select the installation file.

**Step 4** First select the A: drive and then the "Setup.exe" file, passing it back to the Run window with a click.

**Step 5** Start the installation with a click of the Run window's OK button.

**Response** The installation begins the determination of the directory. The structure defined in chapter 3.2 should be utilized.



**Note:** An example for the installation directory might be:  
**E:\ASAD\SPU931**

**Response** After completion of the installation the program can be started by clicking the mouse on the corresponding icon.



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**Part II**  
**Modsoft Configuration**  
**PROFIBUS-DP**

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# Chapter 1

## Configuration of Stations

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Hereafter the individual configuration portions for connection of PROFIBUS–DP will be described.



**Note:** The configuration guide is equally applicable as an **example** for DP networks.

Standard defaults (plant and station(s)) under Modsoft

Define and parameterize a DP bus with SPU 832 (PROFI–KON–DP)

Finalize and generate a DP bus with SPU 931, PLC loading under Modsoft

## 1.1 General Points for PROFIBUS-DP



**Note:** The reader of this documentation should be well informed of the involved principles and functional relationships of PROFIBUS-DP (e.g. DIN 19245, Parts 1, 2 and 3).

Now follows a description of the configuration steps for the individual software packages concerned, within the framework of PROFIBUS communication.

**Part II, Chapter 1.2** Modsoft portions for DP

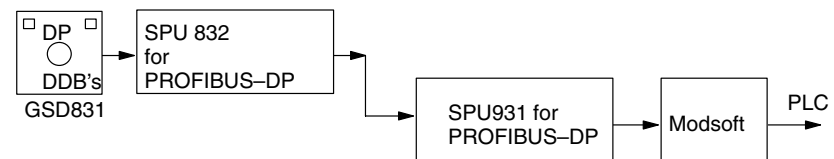
**Part III, Chapter 1** for DP bus projects

**Part III, Chapter 2** for DP bus and I/O mapping

As previously outlined and illustrated in Part I, the following general sequence of tasks applies:

- Project specification (plant and stations) with the **Modsoft** software package.
- Inclusion of the device data sets with parameter modifications using the software package **SPU 832** for PROFIBUS-DP.
- Address mapping and topology determination for bus controllers with the **SPU 931** software package for PROFIBUS-DP networks.
- Downloading the generated data into the PLC using Modsoft.

The following drawing demonstrates the relationships between the concerned configuration tools:



**Figure 4** Configuration tool relationship

The device data base files (GSD files) are manufacturer specific and available on diskette. There are separate device data base files for the DP and Master CRP811 and Schneider DP Slaves on the same diskette.

The required device data base files are imported by the SPU 832 tool and used for configuring of a bus project. The bus project has to be stored in a file.

The file produced is then imported with the SPU931 tool and further modified as needed. The result is then automatically integrated into an existing Modsoft file and subsequently loaded into the PLC with the user program.



## 1.2 Modsoft Configuration Portions (DP)

In the subsequent discussion configuration steps related to **DP** configuration will be handled.



**Note:** The representation offered in Figure 5 only pertains to the DP configuration portions.

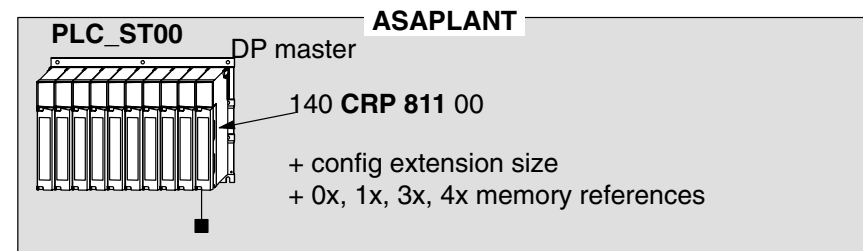


Figure 5 Quantum hardware for the Modsoft PROFIBUS-DP configuration portion

### Names and their Meanings

ASAPLANT: Plant name (characterizes the program directory)

PLC\_ST00: PLC station name (program name)

140 CRP 811 00: DP option board (bus controller)

After the installation under MS-DOS and a corresponding start up program start the following screen appears. Operation within the Windows "DOS box" is also possible.

**Modsoft software tool execution (operation in the DOS box)**



-"Double-click on the Windows icon"

Utility **Offline** Online Combined Transfer Tools Quit

F1 — F2 — F3 — F4 — F5 — F6 — F7—Lev 8—F8—OFF — F9

(R)

# MODSOFT

Modsoft 984

Program Name:  
PLC Adress:  
PLC Type:

**Tab** moves between the Menu Bar and the Editing Screen.  
**ALT H** provides help on the menu item selected by the cursor.

Offline selections access programs, save files and change settings



## 1.2.1 Plant, Station and Station Dependent File Names

### Setting the "Plant name"

–"Offline", "Location of Program Names"

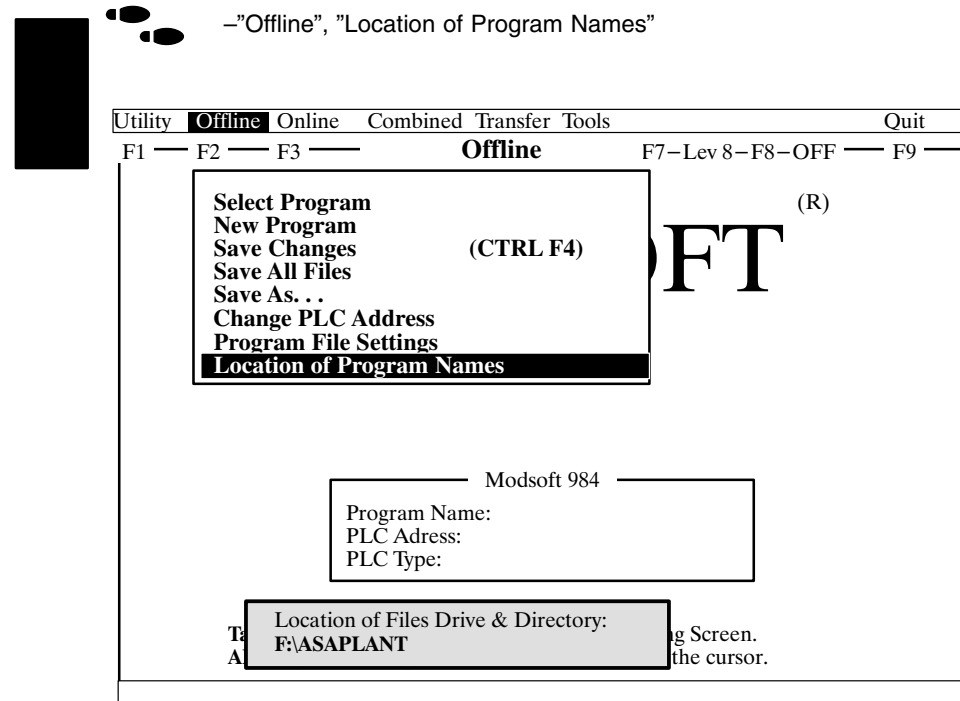


Figure 6 Define new (plant name) directory name

Setting the plant name directory under which the stations will be stored, as e.g. **ASAPLANT**.



## Specifying names for the station dependent files

☛ –"Offline", "New Program"

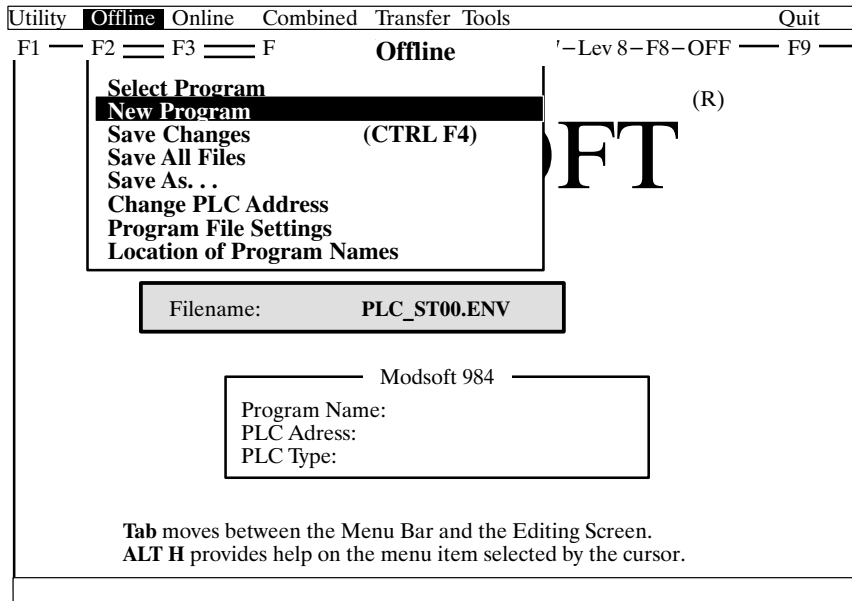
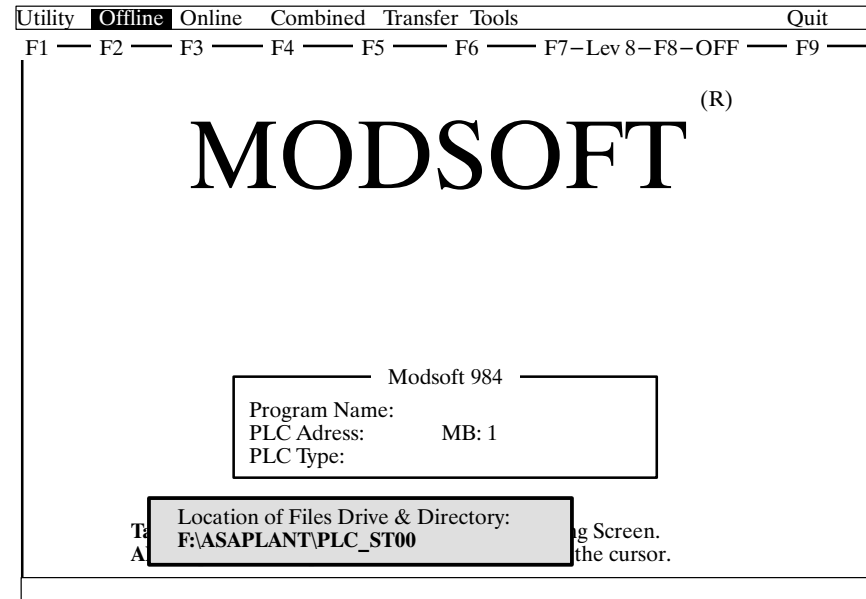


Figure 7 First station dependent file with the .ENV extension

Determination of the **file name** (e.g. PLC\_ST00), under which the station specific files will be stored. The pertinent **directory** name will be determined in the next step. For reasons of clarity the directory name should be derived from the name given to these files, or be identical, for instance **PLC\_ST00**. Refer to the next figure.



**Figure 8 Define new (plant name) directory name**

Setting the station name directory under which the files will be stored, as e.g. **PLC\_ST00**.

## 1.2.2 Define/Modify the remaining PLC Data

### Modbus 1 communication parameter definition

- Define the communication parameters appropriate for the initial station or changes may be made by selecting of:
  - "Offline", "Change PLC Address"

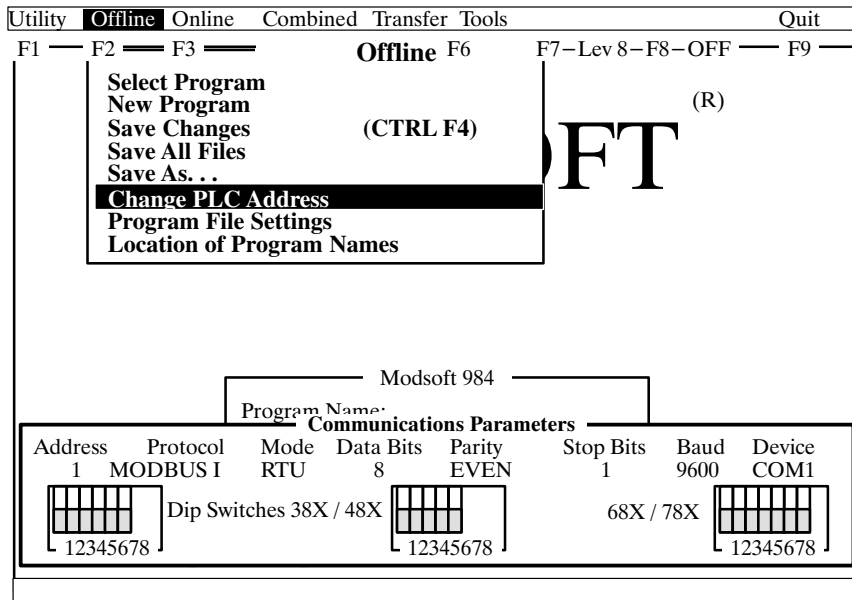


Figure 9 Communications parameters

Determine the communication parameters for transfer of the configured data into the controller.



**Note:** The dip switch settings relate to the MB+ and are only shown here.

### Determining PLC data

At the continuation of the previous entries a new menu line will be displayed.



–"Overview"

or

–"Location of Program", "Select program", Station selection, "F5"

Utility			Overview	I/O Map	Ports	Segments	Loadable	Cfg Ext	Quit	
F1	F2	F3	F4	F5	F6	F7	Lev 8	F8	OFF	F9
<b>CONFIGURATION OVERVIEW</b>										
<b>PLC:</b>			<b>Quantum</b>			Size.....				
PLC Type			Model			.....				
			424 0x *)			I / O:				
System Memory			64.0K			.....				
Extendet Memory			96K			Specials:				
Redundant			N			.....				
DC DROP ID						ASCII:				
<b>Ranges:</b>										
0xxxx	000001	–001008								
1xxxx	100001	–100512								
3xxxx	300001	–300100								
4xxxx	400001	–402000								
4xxxx	SFC	None								
4xxxx	SFC	None								


\*) Permitted CPUs are the 424 0x and x13 0x together with required EXEC-Revisions. (see Validity Note at Preface)

**Figure 10 Overview of configuration settings**

Only the relevant PROFIBUS data were entered. The 486 CPU and the ranges shown are for our example.

## Define PROFIBUS memory utilization

To define the config extension size parameter the following menu command must be selected.


 -"Cfg Ext"  
 or  
 \_"F8"




Utility			Overview	I/O Map	Ports	Segments	Loadable	<b>Cfg Ext</b>	Quit
F1	F2	F3	F4	F5	F6	F7	Lev 8	F8	OFF
<b>CONFIGURATION OVERVIEW</b>									
<b>PLC:</b>			Size.....						
PLC Type			Quantum						
Model			424 0x			I / O:			
System Memory			64K						
Extendet Memory			96K						
Redundant			N			<b>Specials:</b>			
DC DROP ID									
<b>Ranges:</b>									
0xxxx	000001	-001008							
1xxxx	100001	-101008							
3xxxx	300001	-300800							
4xxxx	400001	-402500							
4xxxx	SFC	None							
						Config Extension Size		1/1024	
<b>ASCII:</b>									
4xxxx			SFC			None			

Start Value— \* 1/1024 Actual Value— \* 188/1024 after end of configuration SPU931

\* = for this example

Figure 11 Config extension size setting

### Steps for config size handling

- 
- Step 1** Set the value (i.e. 1024) as default
  - Step 2** Automatically calculate with the SPU 931 (Button Generate).  
Actual value is shown in Generate protocol.
  - Step 3** Optimize the default value depending upon the resulting calculated value using SPU931

Only the PROFIBUS relevant data were entered. In exemplary manner the value of 1024 (suggested value) was given here for the assumed system configuration.



**Note:** The start value will be corrected automatically after end of configuration. Then you can see the actual value.



**Note:** If you increase the CFG extension memory, you will reduce the full logic area size (memory) by the same amount.

## Module slot assignments

In the window as follows, you can select the necessary modules.

- "I/O Map"
- or
- "Location of Program", "Select program", Station selection, "F5", "F4"

With a click on the question mark a table of the permitted components is offered. Choose the desired component and enter in the appropriate slot.

Utility    Overview <b>I/O Map</b> Ports    Segments    Loadable    Cfg Ext    Quit				
F1 — F2 — F3 — F4 — F5 — F6 — F7—Lev 8—F8—OFF — F9				
<b>QUANTUM I / O MAP</b>				
Slot	Module	Input Ref	Output Ref	Desdription
101	140 CPS 214 00			DC PS 24V 10A
102	140 CPU 424 02			CPU 2MB 2xMB+
103	140 DDI 353 00	100001—100032		DC IN 24V 4x8
104	140 DDO 353 00		000001—000032	DC OUT 24V 4x8
105	140 AVI 030 00	300001—300009		AN IN 8CH BIPOLAR
106	140 AVO 020 00		400001—400004	AN OUT 4CH VOLT
107				
108				
109				
110	<b>140 CRP 811 00</b>			<b>PROFIBUS DP</b>
111				
112				
113				

Figure 12 I/O map settings for PLC\_ST00 at DP bus

The option board **140 CRP 811 00** is required for PROFIBUS–DP operation.

### A concluding backup of the configured data

- –"Esc", "Esc", "Esc", "Save all Files"
- or
- "Esc", "Esc", "Esc", "Save as ..."
- and
- close the Modsoft-Programm with "Quit".

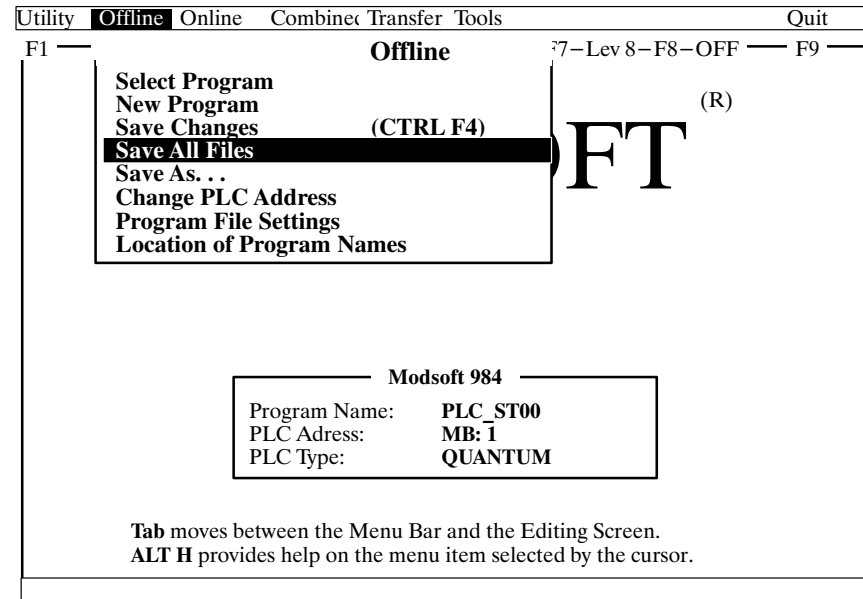


Figure 13 Save data for PLC\_ST00

The next step is configuration with the PROFI-KON-DP (SPU 832) software package.



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# **Part III**

## **DP–Configuration**

---





# Chapter 1

## Parameterization

### Bus Parameters

### SPU 832 (PROFI-KON-DP)

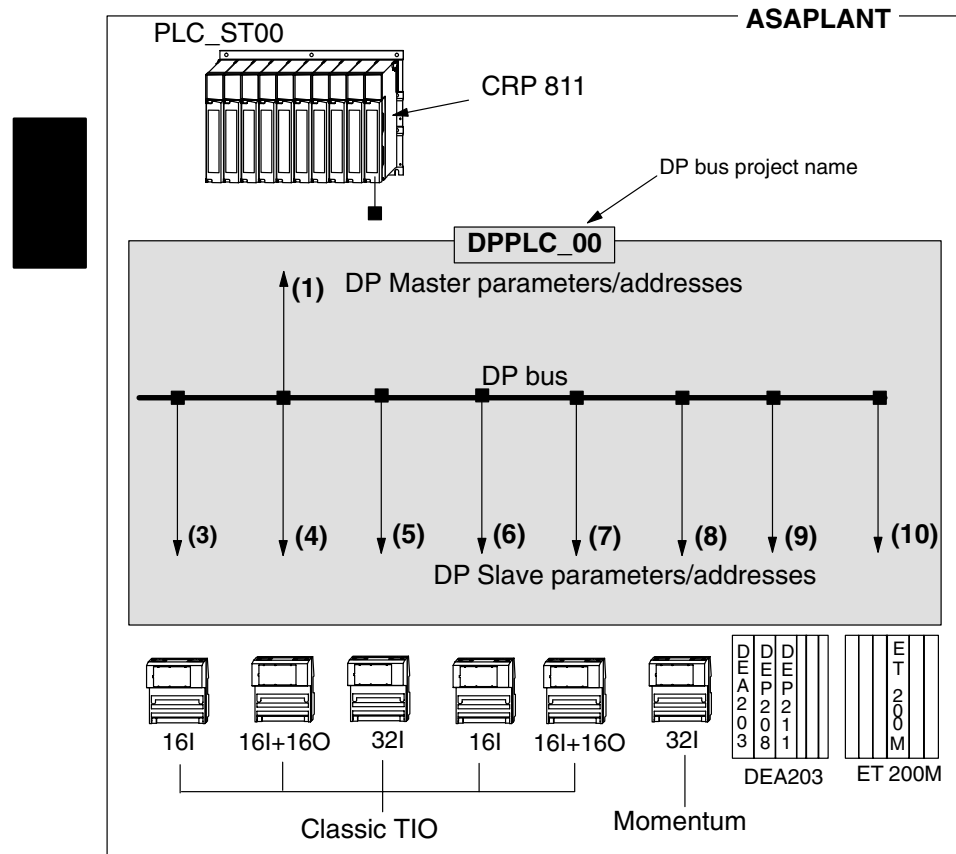
---



In this chapter the configuration steps for both the typical master bus parameters as well as the corresponding slave parameters complement will be determined.

**The bus topology to be configured**

The following part will only handle those configuration steps related to DP topology as shown below.

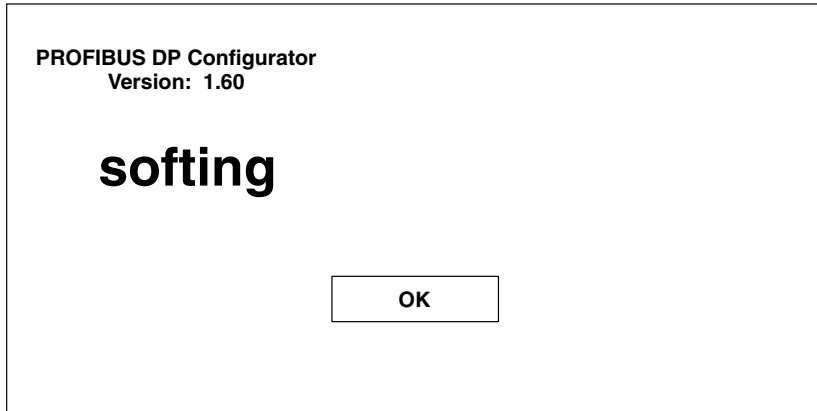


**Figure 14 The bus topology to be configured for the example**

The following screen appears after installing the Profibus DP Configurator and a subsequent program start.

**PROFI-KON-DP (SPU 832) software tool start**

 –"Double-click on the Windows icon"



## Relevant Icons for PROFIBUS DP Configurator Version 1.60

The following icons are located in the menu bar.



Select a Device.



Check a Configuration.



Calculate Bus Parameters.



Copy a slave.



Cut a slave.

## 1.1 Bus Project Definition (DP)

Importing the Device Data Base files for modules used in your topology and selected GSx-files for this project:

☛ –"DDB", "Import", "ADD"

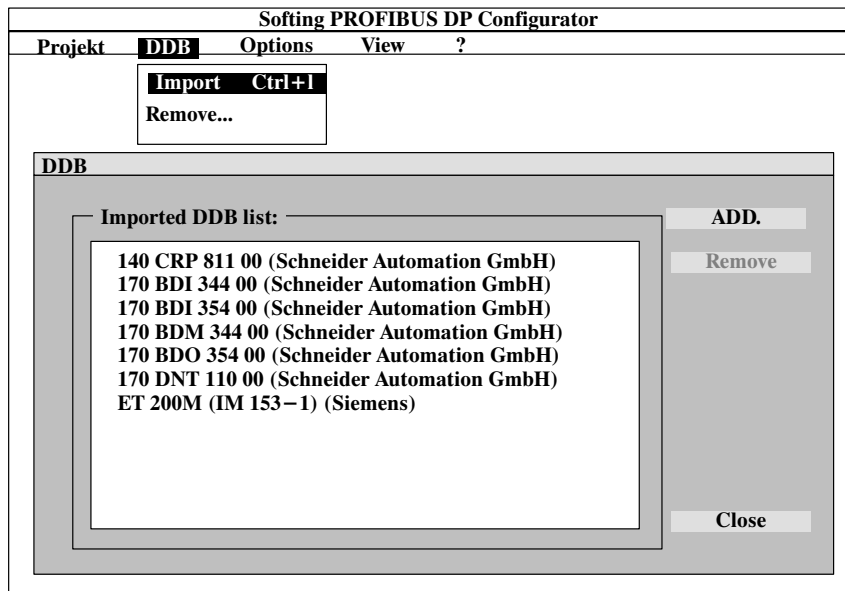


Figure 15 Import of any device data base files (adhering to the PNO standards)

– In accordance with the installation framework, device data base files are located (e.g.) in the E:\ASAD\PROF\_DP\GSD\_DP directory.

– The following steps should be carried out from within the Profibus DP Configurator:

Select the DDB file directory, select the required files and import them with "OK".

Import the required DDB (GSD) file within a double-click or mark one or max. 40 DDB (GSD) files and press the "OK" button.



**Note:** If an error occurs with the DDB (GSD) files all results and error messages are in the logging files gsd\_purs.log (reading) and gsd.log (writing).




**Note:** DDB files must be present for both, master and slave connections.

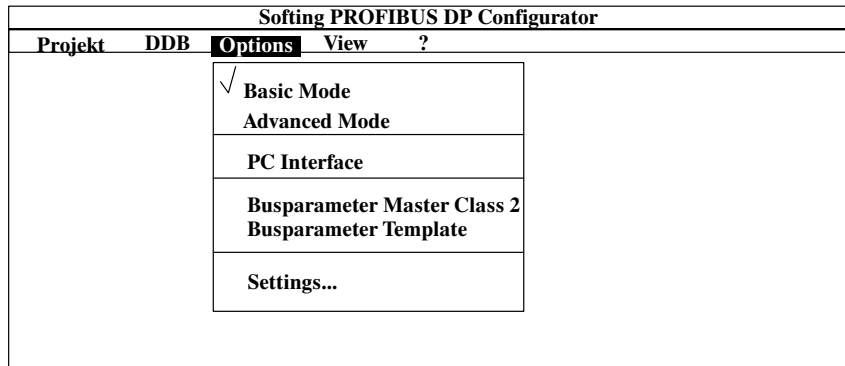


## 1.2 Bus Project Definition (DP)

---

Bus projekt file selection:

 –"Options", "Basic Mode"



### Basic Mode

Watchdog time will not optimized, using icon "Calculate Bus Parameters".  
(Watchdog time is only for fixable Advanced Mode)

### Advanced Mode

Watchdog time will also optimized, using "Calculate Bus Parameters".

### PC Interface

It is only for Softing PC-Card

### Busparameter Master Class 2


It is only for Softing PC-Card

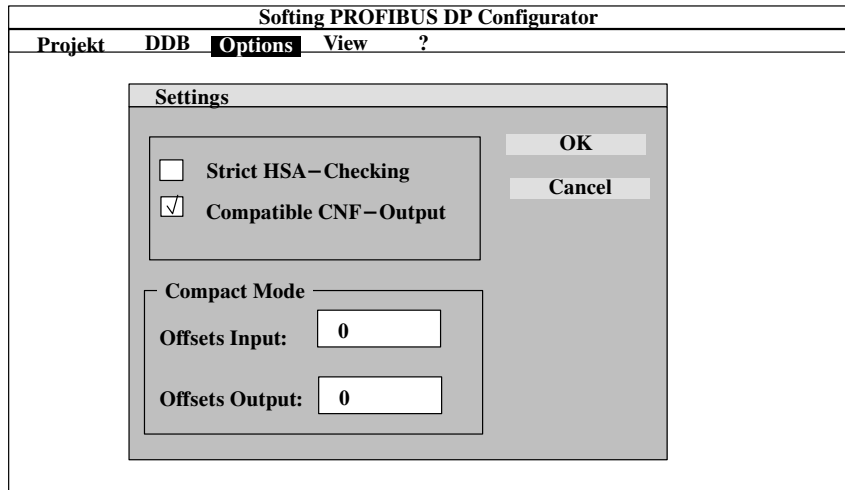
### Busparameter Template

Setting of the default values for DP Parameters. Each new project will start with the values of these parameters.

Softing PROFIBUS DP Configurator						
Project	Edit	Download	Options	View	Window	?
<b>Template Master Parameters</b>			<b>Busparameters</b>			
<b>Station Parameters</b>			<b>Baudrate:</b> 1,5 Mbaud			
Station Address	1		TTR (Master Class)	50000		
Min. Slave Interval	100	(æs)	Delta Ttr (in Bit)	0		
Poll Timeout	500	(ms)	Watchdog/Ttr (in %)	700		
Data Control Time	1500	(ms)	<b>Slot Time:</b>	300		
<input type="checkbox"/> Autoclear			Min. St. Delay Resp.:	11		
<b>Edit Busparameter...</b>			Max. St. Delay	150		
<b>OK</b>	<b>Cancel</b>		Quit Time:	0		
			Setup Time:	1		
			<b>Gap Update Factor:</b>	10		
			Highest Station Addr.:	126		
			Retry Limit:	1		
			<b>OK</b>	<b>Cancel</b>		

## Settings...

 –"Options" , "Settings..."



### Strict HSA-Checking

This is the necessary setting for Quantum.

### Compatible CNF-Output

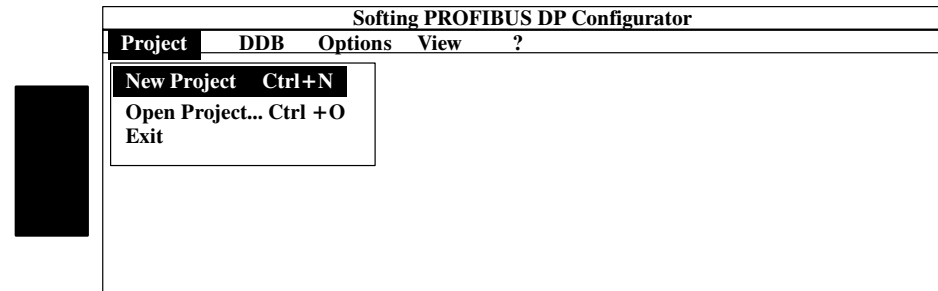
It is compulsory that this setting is used!

Offsets Input – only for Softing PC\_Card  
Offsets Output – only for Softing PC\_Card

## Building a new bus project

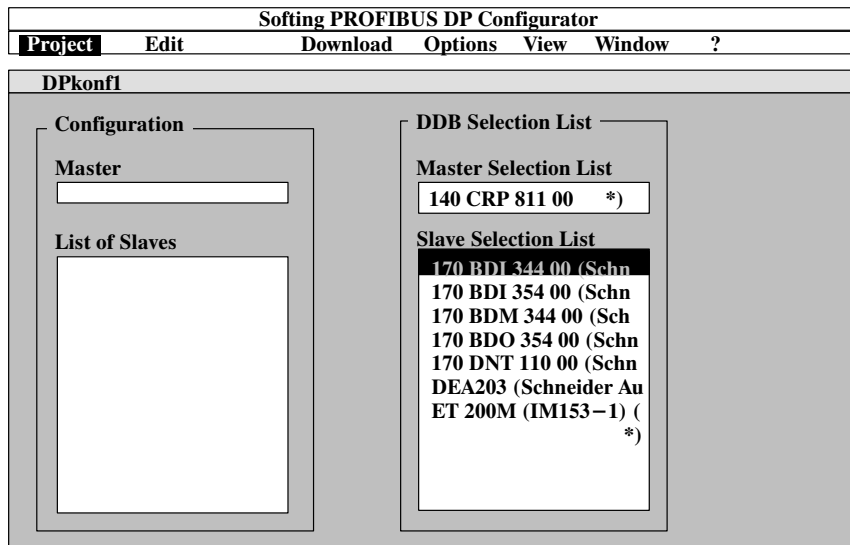
 –"Project", "New Project"

The initial definition of a **bus project** begins here.





**Note:** In the following windows you will see all the parameters from the selected module. But typically only 4 parameters have to be modified for a correct configuration. These parameters are following:

- Min. Slave Interval (master parameter)
- Data Control Time (master parameter T\_DC)
- Max. Station Delay Response Time (master parameter T\_SDR)
- Watch Dog Time (max. T\_WD of a slave)



\*) imported device data base entries \*.gsd ore \*.gsg

### Bus parameter manipulation

- 
 –"Double-click on the selected line"
- or
- 
 –"Click" icon "Select a Device" (see also Relavant Icons)

If bus parameter changes are to be performed, then the entry in the master line must be activated with a double-click.

## 1.3 Master Parameter Entry



–"Project", "Select"

or

–A double-click on the selected master (140 CRP 811 00)

**Softing PROFIBUS DP Configurator**

**Project** Edit Download Options View Window ?

**DP-Master-Configuration**

**Info**

Schneider Automation 140 CRP 811 00  
Ident No: 5506 V3.00

**Parameters**

Station Address 1  
Min. Slave Interval 5000 (T\_Bit)  
Poll Timeout 500 (ms) \*)  
Data Control Time 1500 (ms)  
 Autoclear

**Busparameters**

Baudrate: 12MBaud Edit ..

OK Cancel

\*) Parameters are grey scalled and not changeable in Basic Mode. Changes are possible in Advanced Mode.

### 1.3.1 General

This field contains fixed information:

- The DP master supplier
- DP master type identifier
- Ident no., as determined by the PNO (PROFIBUS User Organization)
- DP master revision index

## 1.3.2 Parameters

### Station Address

The (class 1) controller's project dependent address is to be specified here.

Permitted value range / the default: 1 ... 126 / 1

### Min. Slave Interval

If the slave has passed no data, then only after expiration of this time interval may the next slave be polled. Otherwise the next slave is polled directly after completion of such a data transfer.

Permitted value range / the default: 1 ... 65535 (T\_BIT) / 2000



**Caution:** This parameter will be automatically corrected according to the slave which contains the maximum value of "Min. Slave Interval" (after selection the icon "Check a Configuration").

### Poll Timeout

is the time following an error, after which a (class 1/2) DP master is reset.

Permitted value range / the default: >>100ms / 500

### T\_DC, Data Control Time (dependent upon the baudrate and the slave watch dog time)

is the time frame required to check DP slave status when autoclear mode is active.



**Caution:** This T\_DC-value has to be 6 times of slave T\_WD (T\_DC = 6 x T\_WD). Are there different times, if there is more than one slave, you have to use the greatest value.

□ Permitted value range / the default: 10...655350 / 1000 (600 for the example)

### Autoclear (not supported by CRP 811)

Autoclear is a (class 1) DP master operating mode. The master updates the clear status (if enabled), when at least one DP slave no longer participates in bus communications.

Softing PROFIBUS DP Configurator

Project Edit Download Options View Window ?

DPkonfl

Configuration

Master

001: 140 CRP 811 00

List of Slaves

DDB Selection List

Master Selection List

140 CRP 811 00 (\*)

Slave Selection List

170 BDI 344 00 (Schne  
170 BDI 354 00 (Schne  
170 BDM 344 00 (Scne  
170 BDO 354 00 (Shne  
170 DNT 110 00 (Schne  
DEA203 (Schneider Au  
ET 200M (IM153-1) (\*

\*) imported device data base entries \*.gsd ore \*.gsg



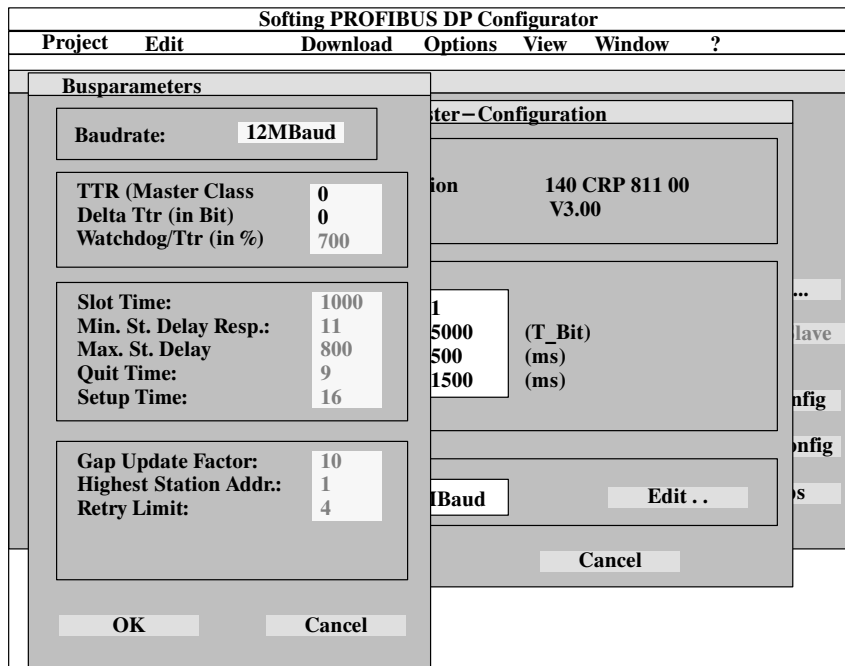
### 1.3.3 Busparameters

#### Baudrate

is the bus speed of the (class 1) DP master. It can be chosen from a selection list.

- Possible bus speeds: 9,6 / 19,2 / 93,75 / 187,5 / 500 Kbaud,  
1,5 / 3 / 6 / 12 Mbaud
- Default bus speed: 1,5 Mbaud

☛ –"Double-click" on the Master (140 CRP 811 00)" , "Edit"





**Note:** All parameters are changeable only with Advanced Mode, exclude T\_TTR.

**Edit.... (the detailed specification of bus parameters)**

The following parameter values are suggested for the determined bus speeds. They should be altered by the user as needed. The following values are suggested for use with Quantum under Modsoft:

**Table 1 CRP 811 bus parameters / reactiontimes for DP–Master**

Parameter	<=187,5 KBd	500 KBd	1,5 MBd	3 MBd	6 MBd	12 MBd
T_TTR (multi master)	50 000	50 000	50 000	50 000	50 000	50 000
Watchdog/T_TTR Ratio 1	1	1	1	1	1	1
Slot Time	500	1000	1500	1500	2000	2000
Min. St. Delay Resp.	11	11	11	11	11	11
Max. St. Delay Resp.	60	100	150	45	55	75
Quiet Time	0	0	0	3	6	9
Setup Time	1	1	1	1	1	1
Gap Update Factor	10	10	1	1	1	1
Highest St. Address	126	126	126	126	126	126
Retry Limit	1	1	1	2	3	4

**T\_TTR, Total Token Rotation Time (only for multi master)**

Before token hold time pass on to the next master. A single master passes the token on to itself. This entry is meaningless for passive nodes.

Possible value range: 1 ...  $2^{24} - 1$  (T<sub>Bit</sub>)

The possible default : refer to Table 1.

### **Watch Dog/T\_TTR Ratio**

is the (master) Watchdog Time ratio to TTR.

Possible value range: 1 ... 10

The possible defaults: refer to Table 1.

### **Slot Time (T\_SL)**

The slot time is applied to bus protocol monitoring in two ways. First, a node sending a request telegram expects a response telegram within the allocated time slot. Secondly, after receiving the token a station must send a request telegram of its own within the slot time, or pass off the token. The declaration is made in bit times (1/baudrate).



Possible value range:  $1 \dots 2^{16} - 1$  ( $T_{\text{Bit}}$ )

The possible default varies with the bus speed: refer to Table 1.

### **Min. St. Delay Resp. (min T\_SDR)**

Minimum responder station delay time, i.e. a responder may only send a response telegram after this time has expired.

Possible value range:  $1 \dots 2^{16} - 1$  ( $T_{\text{Bit}}$ )

The possible default varies with the bus speed: refer to Table 1.

### **Max. St. Delay Resp. (max T\_SDR)**

Maximum responder station delay time, i.e. a responder must have started to send its response telegram before this time has expired.

Possible value range:  $1 \dots 2^{16} - 1$  ( $T_{\text{Bit}}$ )

The possible default varies with the bus speed: refer to Table 1.



**Caution:** The max.  $T_{SDR}$  of master = equal or greater than the max.  $T_{SDR}$  of the slave with the max. time.

#### **Quiet Time ( $T_{QUI}$ )**

is the modulator delay time after the end of telegram. It is only pertinent when repeaters and modulators are used.

Possible value range: 0 ... 255 ( $T_{Bit}$ )

The possible default varies with the bus speed: refer to Table 1.

#### **Setup Time ( $T_{SET}$ )**

Def.: The reaction time between the arrival of an interrupt request and execution of the necessary response.

Possible value range: 1 ... 255 ( $T_{Bit}$ )

The possible default varies with the bus speed: refer to Table 1.

#### **Gap Update Factor (G)**

This factor dictates the number of token passes that can be made after a GAP telegram to accept a new station into the logical ring is sent. This entry is meaningless for passive nodes.

Possible value range: 1 ... 255

The possible default: refer to Table 1.

### Highest Station Address (HSA)

is the highest bus address up to which the presence of master nodes is examined. The gap update factor determines how many token passes will be performed afterwards.



**Note:** To achieve the most efficient response time between node actualizations, your address for the highest station should be as low as possible.

Possible value range: 2 ... 126

The possible defaults: refer to Table 1.

### Retry Limit (max\_retry\_limit)

This value determines how often layer 2 must repeat a request telegram if it does not receive a response telegram from a known station within the allocated time frame/slot.

Possible value range: 1 ... 8

The possible default : refer to Table 1.



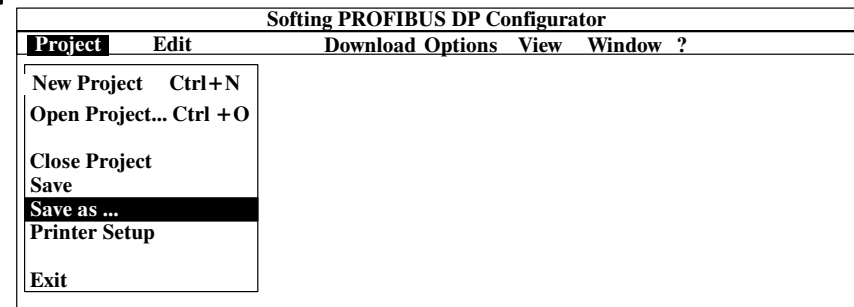
## 1.4 Initial Safeguarding of Data

---

 –"Project", "Save as ..."


The station directory defined and saved earlier under Modsoft will be displayed.  
Example: **DPPLC\_00**


After completing entries for the master, make an initial backup. (The master is taken from the list in the configuration section). Data storage takes place as shown in the example under the **DPPLC\_00** file name. The complete path is then **F:\ASAPLANT\PLC\_ST00\DPPLC\_00**



**Note:** Assignment of the master address is designated after the backup. (Refer to the next figure)

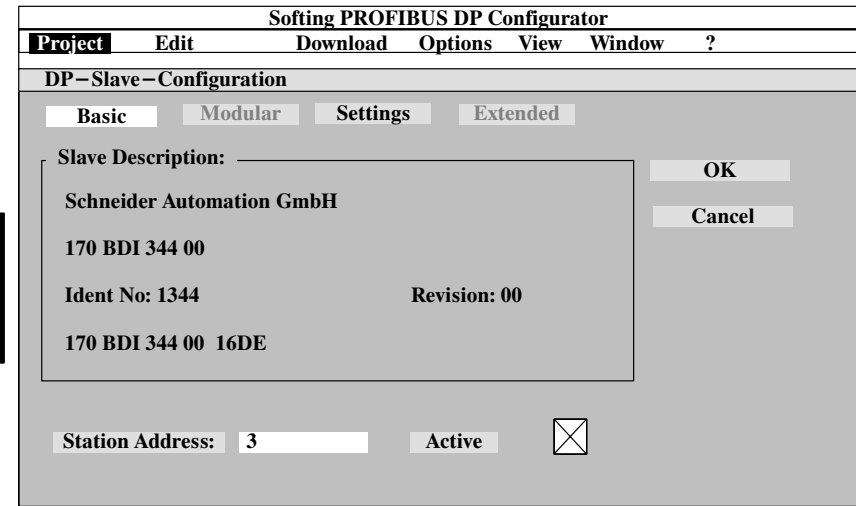
## 1.5 Slave Parameter Entry

 **Note:** The appropriate parameters must be entered or selected for all bus-active slaves.

-  –Double-click on the selected slave mode
- or
- Click icon "Select a Device" (see also Relevant Icons)

Softing PROFIBUS DP Configurator					
Project	Edit	Download	Options	View	Window ?
<b>DPkonfl</b>					
<b>Configuration</b>			<b>DDB Selection List</b>		
<b>Master</b>			<b>Master Selection List</b>		
<input type="text" value="140 CRP 811 00"/>			<input type="text" value="140 CRP 811 00"/>		
<b>List of Slaves</b>			<b>Slave Selection List</b>		
<input type="text"/>			<input type="text" value="170 BDI 344 00 (Schne"/>		
			<input type="text" value="170 BDI 354 00 (Schne"/>		
			<input type="text" value="170 BDM 344 00 (Schn"/>		
			<input type="text" value="170 BDO 354 00 (Schne"/>		
			<input type="text" value="170 DNT 110 00 (Schn"/>		
			<input type="text" value="DEA203 (Schneider Au"/>		
			<input "="" type="text" value="ET 200M (IM153-1) ("/>		

## DP Slave Configuration



Softing PROFIBUS DP Configurator

Project Edit Download Options View Window ?

DP - Slave - Configuration

Basic Modular Settings Extended

Slave Description:

Schneider Automation GmbH

170 BDI 344 00

Ident No: 1344 Revision: 00

170 BDI 344 00 16DE

Station Address: 3 Active

OK

Cancel

### Basic/"Slave" Description

This field contains fixed information:

- The DP slave supplier
- DP slave type identifier
- Ident no., as determined by the PNO (PROFIBUS User Organization)
- DP slave module revision index

### Basic/Station Address

Here the slave node's project dependent bus reference number is allocated.



**Note:** The address designation within the plant is arbitrary.



- ❑ Permitted value range / default : 3 ... 99 / The next free will always be offered.,

**Basic/Active**

This parameter is always set for Schneider Automation products (non-existent control function).

**Settings/Operation Mode**

Under this menu command reside control functions, which can be activated/deactivated here.  
 (Sync Req. and Freeze Req. are **not** supported by the CRP 811.)



**Softing PROFIBUS DP Configurator**

**Project**   Edit   Download   Options   View   Window   ?

---

**DP-Slave-Configuration**

Basic   Modular   **Settings**   Extended

**Operation Mode**

Min. Station Delay Responder    (TBit)

Sync Req

Freeze Req.

Fail Save

Watchdog Time (ms):

**Groups**

1    2    3    4

5    6    7    8

**User Prm Data**

1.	00
2.	00
3.	00
4.	00
5.	00
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	

OK   Cancel

#### Operation Mode/Min. Station Delay Responder:

Minimum responder station delay time, i.e. a responder may only send its response telegram after expiration of this time.

□ Permitted value range / default : 1 ... 255 / 11 (T\_Bit)

#### Operation Mode/Sync Req.

Is not supported by the CRP 811.

#### Operation Mode/Freeze Req.

Is not supported by the CRP 811.

#### Operation Mode/Watchdog Time (T\_WD)

The supervision time within which the master must have polled the slave. If not polled by the master, any resident slave node outputs are placed in the secure state.



**Caution:** The T\_DC value of master has to be 6 times of slave T\_WD ( $T_{DC} = 6 \times T_{WD}$ ). Are there different times, if there is more than one slave, you have to use the greatest value.



**Caution:** T\_WD = more greater than "Min. Slave Interval" ( $T_{WD} \gg \text{Min. Slave Interval}$ ).

Enabled: Watchdog timer is active (as shown in the example).

Not enabled: Watchdog timer is not active.

□ Permitted value range / default : 1 ... 655350 ms / 100



**Note:** The value is depending on user specifications and the selected module.

**Table 2 Typical Values for 10 to 15 slaves**

Parameter	<=19,2KBd	93,75 KBd	187,5 KBd	1,5 MBd	<=12 MBd
Watch dog time	500	400	300	200	100



**Note:** In the Advanced Mode (up to version 1.60) the watchdog time will be calculated automatically.



**Note:** You can see the description of Basic- and Advanced Mode in chapter 1.2 (Page 47).

### Groups

Is not supported by the CRP 811.

### User Prm Data (User Parameter data)

Supplier specified parameter set. (see supplier documentation)



**Caution:** Before saving select the icon "Calculate Bus Parameters" first and then the icon "Check a Configuration" to test the functionality between master and slave.

Softing PROFIBUS DP Configurator

Project Edit Download Options View Window ?

DPkonfl

Configuration

Master

140 CRP 811 00

List of Slaves

003: 170 BDI 344 00 (A

004: 170 BDM 344 00 (

005: 170 BDI 354 00 (

006: 170 BDI 344 00 (

007: 170 BDM 344 00 (

008: 170 DNT 110 00

009: DEA203 (Schneid

010: ET 200M (IM 153

DDB Selection List

Master Selection List

140 CRP 811 00

Slave Selection List

170 BDI 344 00 (Schne

170 BDI 354 00 (Schne

170 BDM 344 00 (Schn

170 BDO 354 00 (Schne

170 DNT 110 00 (Schne

DEA203 (Schneider Au

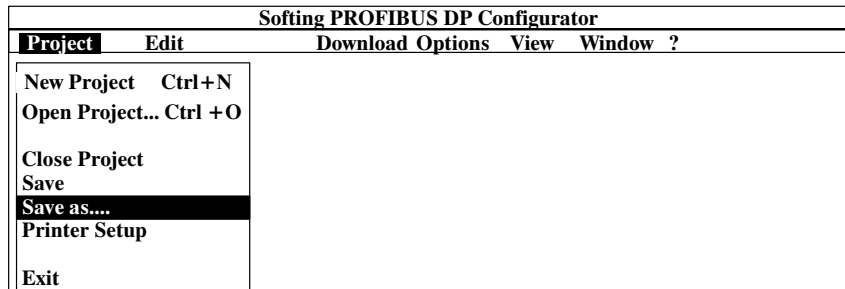
ET 200M (IM153-1) (

## Save Data

 –"Project", "Save as ..."

Considering previous transactions, the station directory for storage as previously specified under Modsoft will be displayed accordingly.

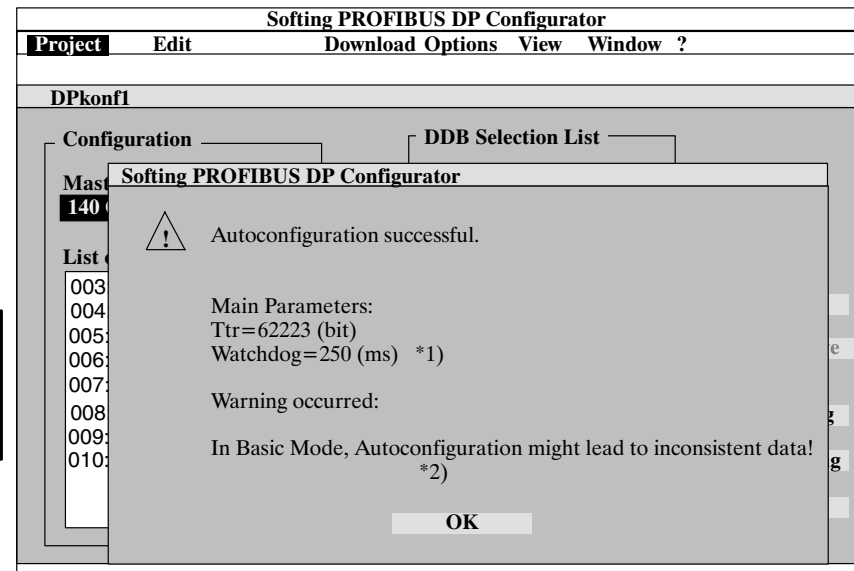
Example: F:\ASAPLANT\PLC\_ST00\DPPLC\_00



Execution of this function checks the configuration's correctness with a test run. Any configuration discrepancies found will be reported.



**Caution:** Each time before saving, select the icon "Calculate Bus Parameters" first and then "Check a Configuration" in order to test the functionality between master and slave.




\*1) It means the watchdog time is different from the optimized value.

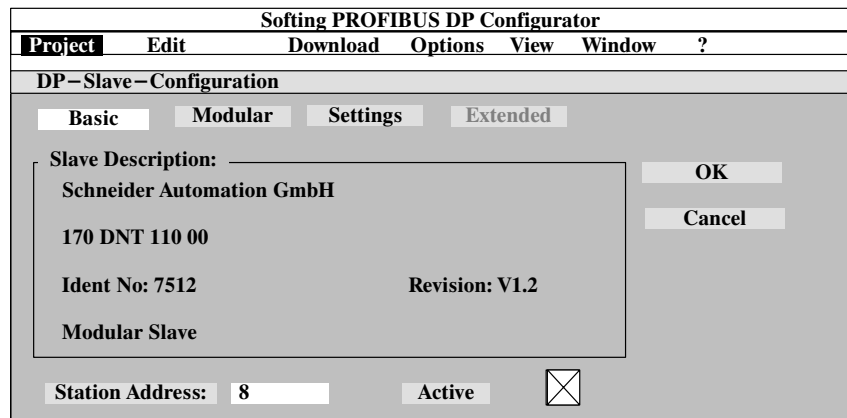
\*2) The configured value of watchdog has to be equal or bigger than the listet watchdog time listed at the message windows.

The next step within the PROFIBUS–DP configuration framework is the proces-  
sing with the SPU 931 software package, after you have closed the Profibus DP  
– program (refer to **next chapter** ).

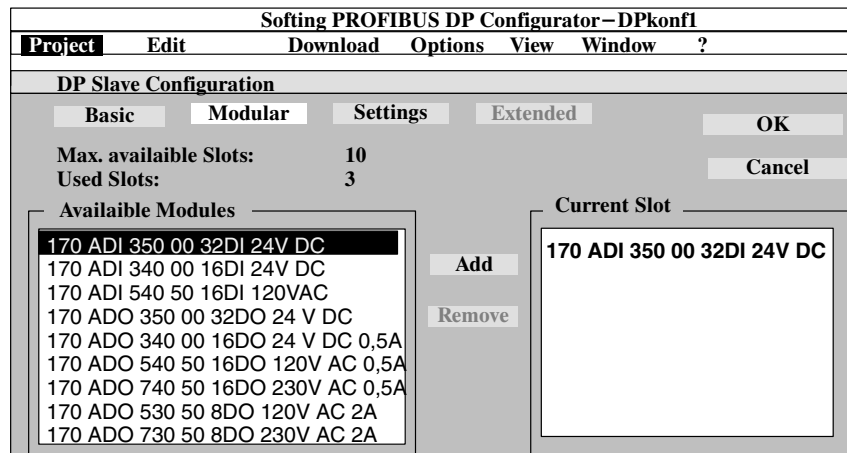
## 1.6 Module Selection for Modular Slaves

### 1.6.1 For Momentum with DP Slave DNT 110 00

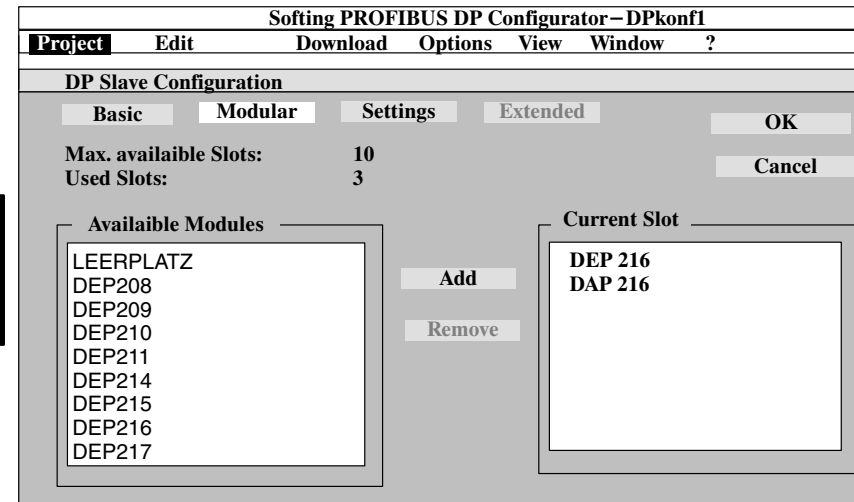
 –"Doppel-click on Slave 170 DNT 110 00 "Basic" and "Modular"



Select the required I/O-Module.



## 1.6.2 For A120 with modular DP Slave DEA203



For modular DP Slaves (z.B. DEA203) you have to select the user modules for the required slave in the screen "Modular"

- Step 1** Select a module from the text box "Available Modules" as the module in the first slot of your modular slave.
- Step 2** With click on the button "Add" the module is shown in the textbox "Current Slots".
- Step 3** See step 1 for slot 2.
- Step 4** See step 2

"Max. available slots" is the limit of modules for the configured DP Slave.



### 1.6.3 For Modular DP Slave Siemens ET 200M

Softing PROFIBUS DP Configurator - DPkonfl

Project Edit Download Options View Window ?

**DP Slave Configuration**

Basic Modular Settings Extended OK

Max. available Slots: 11  
Used Slots: 4 Cancel


Available Modules

- Config for Slot 1
- Config for Slot 2
- Config for Slot 3
- 6ES7 321-7RD00-0A0B 4DE
- 6ES7 321-1FF0\*-0AA0 8DE
- 6ES7 321-1BH0\*-0AA0 16DE
- 6ES7 321-1E0H\*-0AA0 16DE
- 6ES7 321-1BH5\*-0AA0 16DE
- 6ES7 321-1FF00-0AA0 8DE

Add Remove

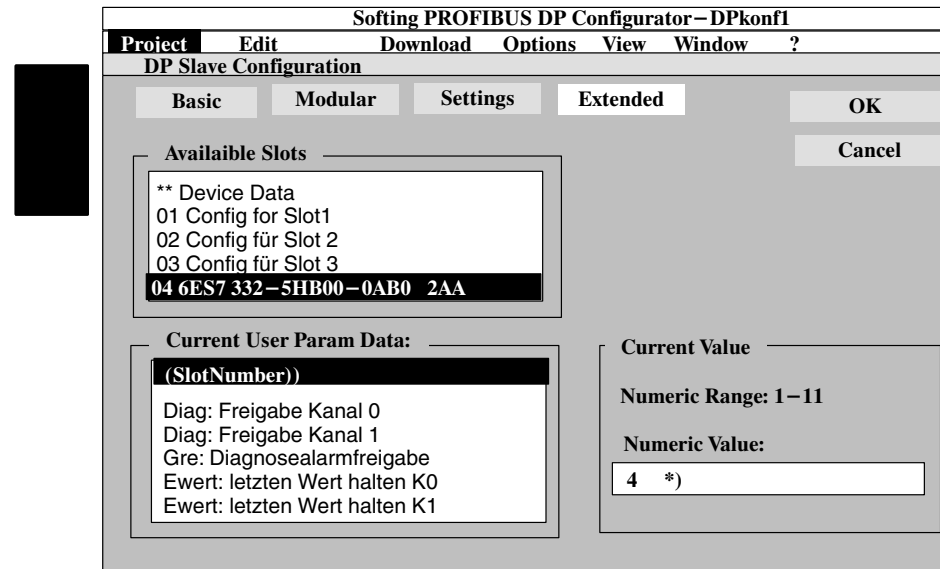
Current Slot

- 01 Config for Slot 1
- 02 Config for Slot 2
- 03 Config for Slot 3
- 04 6ES7 332-5HB00-0AB0 2AA



## 1.7 User parameter Data Text Screen "Extended"

For DP-Slaves Siemens ET 200M



\*) The Slotnumber has to be corrected in the value 4. It has to be the same as in "Available Slots"

For compact or modular DP slaves with the new DDB Generation named "GS(X)" (e.g. GSG=> Parameter Text in German,...), you can select user parameter data in the text box "Current User Param Data" and this value in the text box "Symbolic Value".

# Chapter 2

## I/O Mapping and Finalizing SPU 931 (DP)



---

In the following steps the slave I/O addresses will be mapped into PLC memory and the bus controller assigned to the bus project.

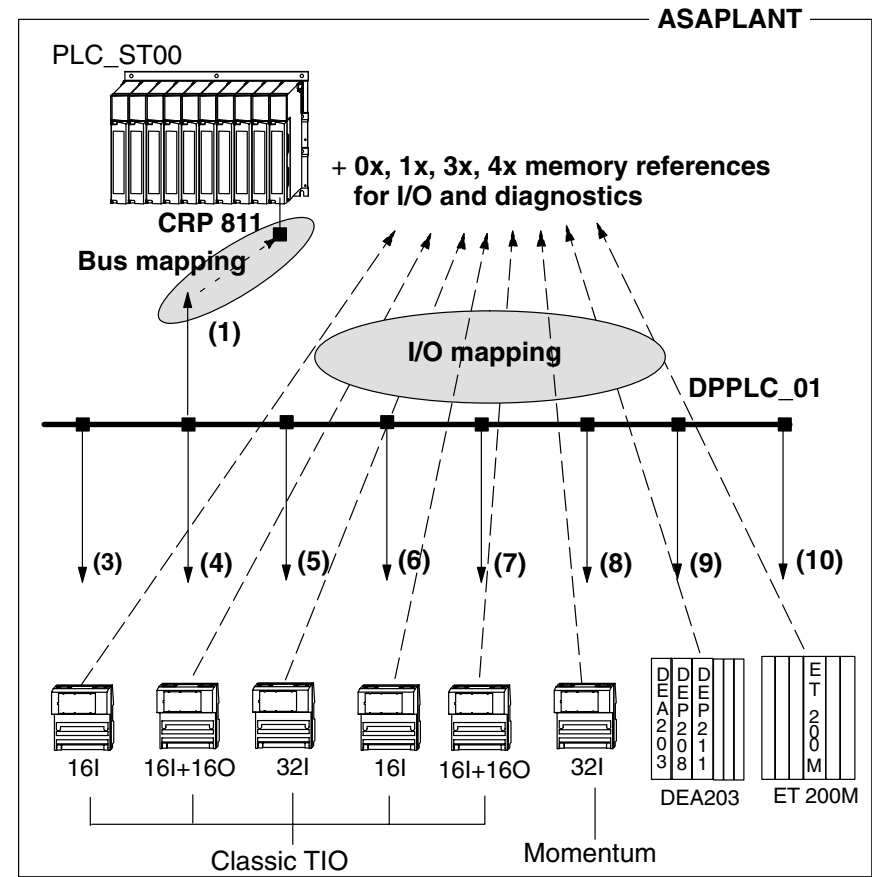


Figure 16 Assignment between the bus project and nodes of a plant

## 2.1 Defining Topology and Assigning I/O Parameters:

---

SPU 931 software tool execution for DP



–"Double-click on the Windows icon"



## 2.1.1 A Modsoft Plant (Example: ASAPLANT):

### Plant selection



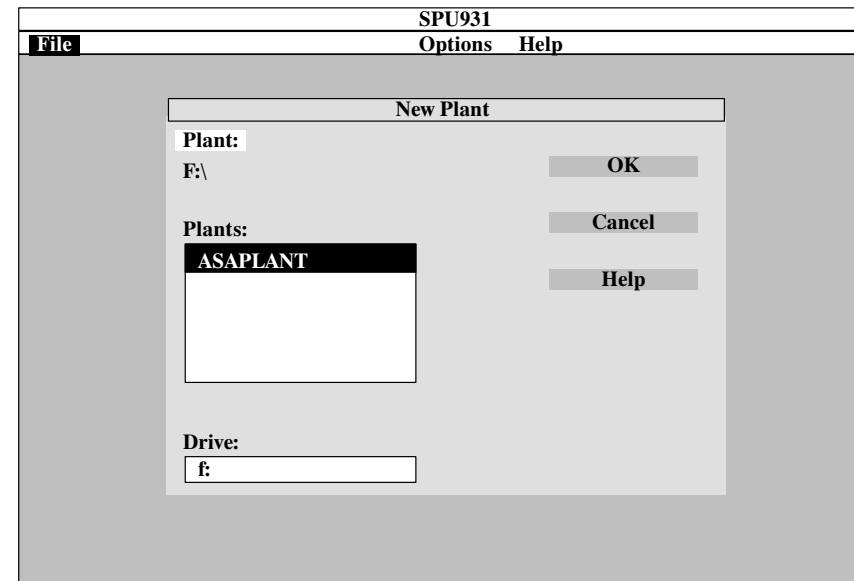
–"File", "New Plant"

(When the Modsoft plant is still unknown to SPU 931)

–"File", "Open Plant"

(If SPU 931 already knows of the Modsoft plant)

Under Drive select the drive on which the Modsoft configured plant resides (e.g. **F:**). The plant names to be found there are entered automatically into the plants: dialog box. In this example it is a plant named **ASAPLANT**.




**Note:** You can open a context sensitive note pad (for user specific informations) with double click on a window which is opened.

## Plant registration

- –"Double-click on plant name"
- or
- "Click", "OK"

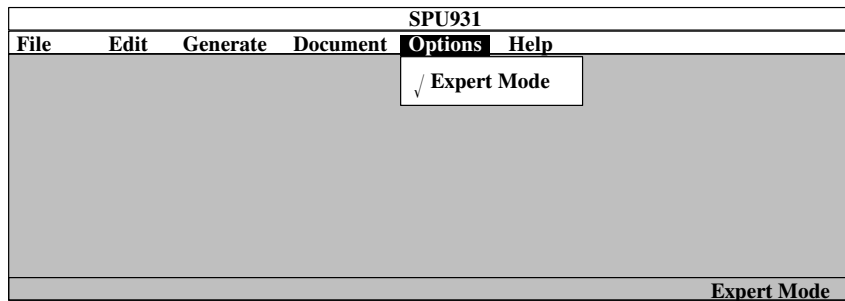
After plant registration the **Main Menu** will be displayed.

 **Note:** Only expert mode is pertinent to PROFIBUS-DP at this time.


## 2.1.2 Enabling Configuration Options

This function enables additional configuration operations.

### SPU 931 Main Menu



### Enable Expert Mode

 –Options”, ”Expert Mode”

This alternative mode setting is effective exclusively within the diagnostics column.

#### Expert mode not selected:

Diagnostic address entry fields **cannot be edited** resp. **cannot be changed**.

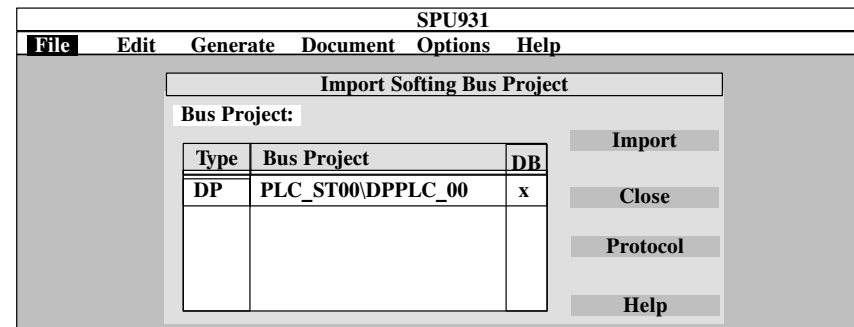
#### Expert mode selected:

Diagnostic addresses **can be entered** resp. **can be changed**.

## 2.1.3 Bus Project Processing (DP)

### Bus project importation


 –”File”, ”Import”, ”Bus Project Softing”

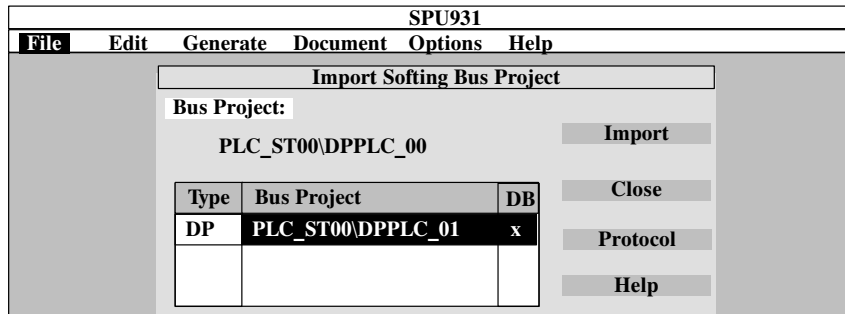


DB=x: Data are already imported!!!



## Bus project selection

 –"Click on the bus project to be processed", "Import"



 –"Click on the "Close"-button in order to get into the main-menu.

### 2.1.4 Bus Mapping

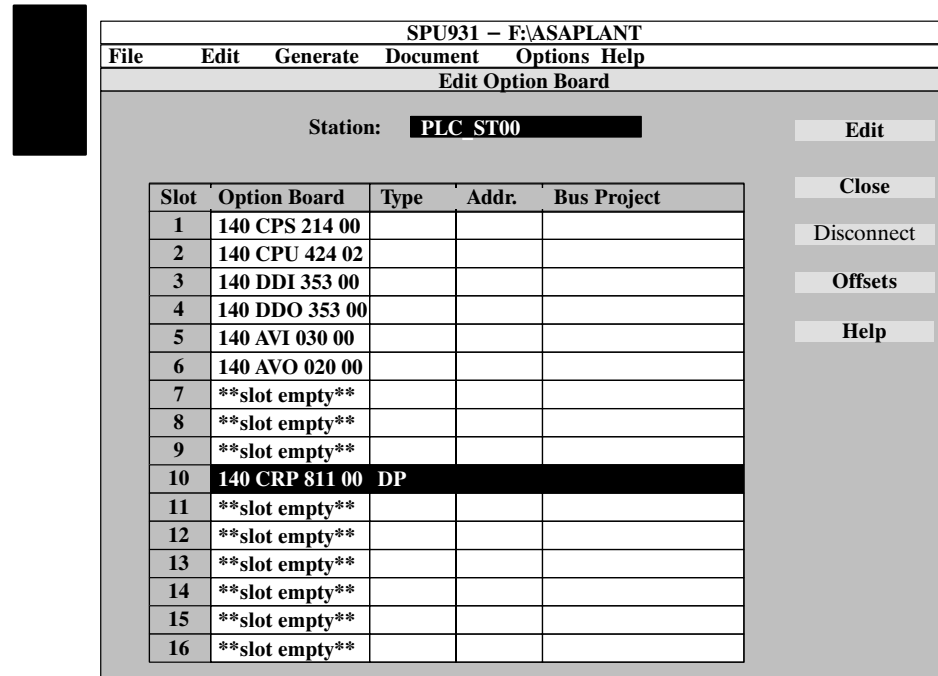
Bus project to controller assignment.

### Option board selection

Chose the "Edit" field in the Main Menu in order to get into the menu "Edit Option Board".



The desired station must have been selected through the dialogbox.



SPU931 – F:\ASAPLANT

File Edit Generate Document Options Help

Edit Option Board

Station: **PLC ST00**

Slot	Option Board	Type	Addr.	Bus Project
1	140 CPS 214 00			
2	140 CPU 424 02			
3	140 DDI 353 00			
4	140 DDO 353 00			
5	140 AVI 030 00			
6	140 AVO 020 00			
7	**slot empty**			
8	**slot empty**			
9	**slot empty**			
10	140 CRP 811 00	DP		
11	**slot empty**			
12	**slot empty**			
13	**slot empty**			
14	**slot empty**			
15	**slot empty**			
16	**slot empty**			

### Adaption of I/O Map and Backplane Configuration

The I/O Map will display incomplete stations after an upload with Modsoft or changed CRP 811 backplane slot; as seen in the following screen.

**SPU931 – F:\ASAPLANT**

**File    Edit    Generate    Document    Options    Help**

**Adapt Configurations**

There are differences between the configuration in the SPU931 Database and Modsoft I/O Map. Station: **PLC\_ST00**  
Please adapt the configurations! Ok

SPU  Show Differences Modsoft Cancel

Slot	Option Board	Type		Slot	Option Board	Type
1	140 CPS 214 00		<..ADD	1	140 CPS 214 00	
2	140 CPU 424 02		Accept..>	2	140 CPU 424 02	
3	140 DDI 353 00		Remove	3	140 DDI 353 00	
4	140 DDO 353 00			4	140 DDO 353 00	
5	140 AVI 030 00			5	140 AVI 030 00	
6	140 AVO 020 00			6	140 AVO 020 00	
7	**slot empty**			7	**slot empty**	
8	**slot empty**			8	**slot empty**	
9	**slot empty**			9	**slot empty**	
10	140 CRP 811 00	DP	All SPU..>	10	140 CRP 811 00	DP
11	**slot empty**		<..All Modsoft	11	**slot empty**	
12	**slot empty**			12	**slot empty**	
13	**slot empty**			13	**slot empty**	
14	**slot empty**			14	**slot empty**	
15	**slot empty**			15	**slot empty**	
16	**slot empty**			16	**slot empty**	

Help

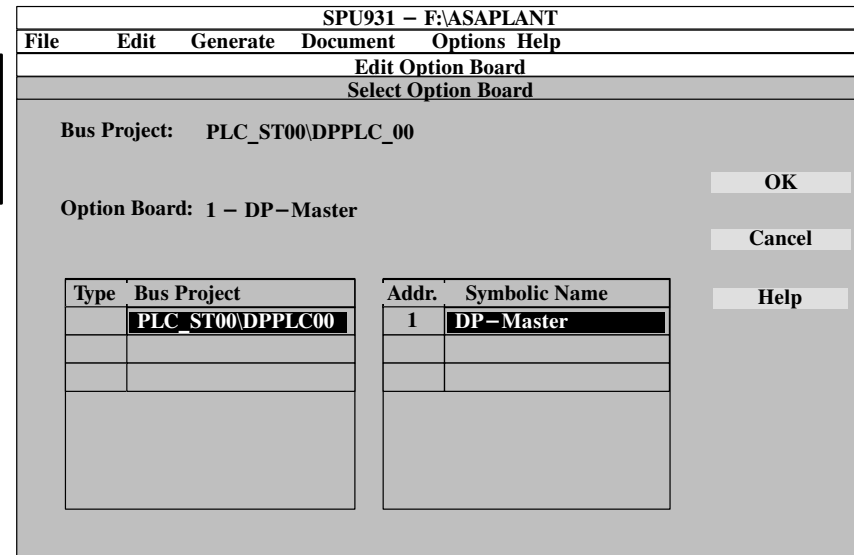
With the buttons you can correct the assignment between SPU and Modsoft.

### Bus project selection




–"Edit", "Select"  
or "Double-click on the highlighted PROFIBUS-DP-master"

The following screen is then invoked.



Should several bus projects exist, the appropriate selection should be made.

**Assignment of the selected bus project to the option board**

 –"Click on bus project", "OK"

The following screen is then displayed for further processing.

SPU931 – F:\ASAPLANT				
File	Edit	Generate	Document	Options Help
Edit Option Board				
Station:		<b>PLC_ST00</b>		
<input type="button" value="Edit"/> <input type="button" value="Close"/> <input type="button" value="Disconnect"/> <input type="button" value="Offsets"/> <input type="button" value="Help"/>				
Slot	Option Board	Type	Addr.	Bus Project
1	140 CPS 214 00			
2	140 CPU 424 02			
3	140 DDI 353 00			
4	140 DDO 353 00			
5	140 AVI 030 00			
6	140 AVO 020 00			
7	**slot empty**			
8	**slot empty**			
9	**slot empty**			
10	140 CRP 811 00	DP	1	PLC_ST00\DPPLC_00
11	**slot empty**			
12	**slot empty**			
13	**slot empty**			
14	**slot empty**			
15	**slot empty**			
16	**slot empty**			

**Close**

The current window is closed and stored.


**Disconnect**

The existent bus project to option board allocation is revoked.

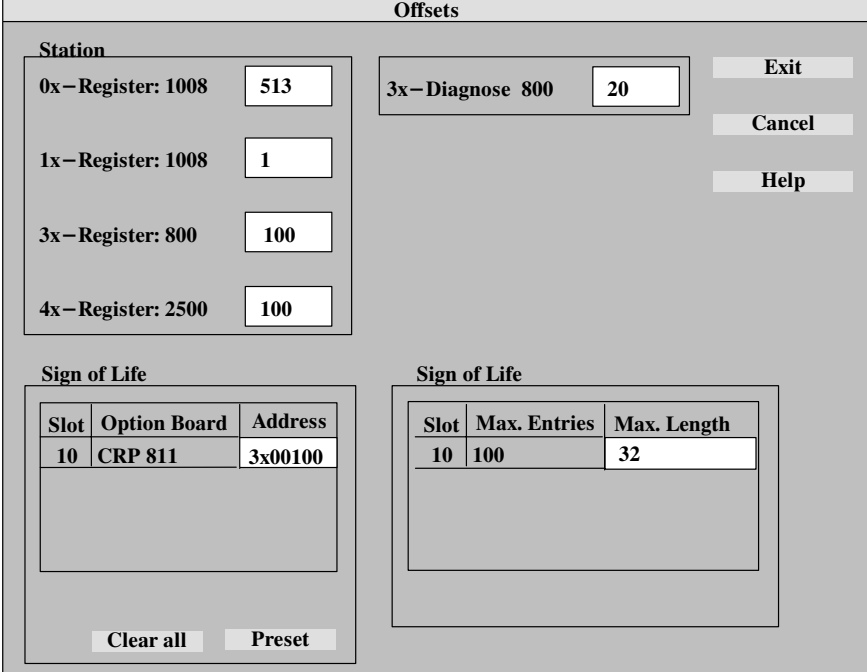
## 2.1.5 I/O Mapping

I/O and diagnostic address assignments to Modsoft state ram

### Setting offsets (for slave nodes to the DP master)

 – "Edit", "Offsets"

The entered values are used for the example.



**Station**

0x-Register: 1008	513
1x-Register: 1008	1
3x-Register: 800	100
4x-Register: 2500	100

3x-Diagnose 800 20

**Sign of Life**

Slot	Option Board	Address
10	CRP 811	3x00100

**Sign of Life**

Slot	Max. Entries	Max. Length
10	100	32

Clear all    Preset

Exit  
Cancel  
Help

The offset for automatic entry of slave signal areas and diagnostic addresses can be specified through numerical entry.

The corresponding initial address is specified with the numerical entry. The slave I/O points are then mapped into PLC state ram starting at this address. Mapping takes place automatically when preset is selected. Manual entry is required when CLEAR is selected. (see next page) The available range lies above the offset.

The maximum number of diagnostic **entries** placeable within the CRP 811 receive buffer has a default value of 100. For the actual project the diagnostic entries must be greater than 3\* number of slaves. The diagnostic buffer **length** must be chosen such that the longest possible diagnostic entry acceptable.



**Note:** Maximum size of the diagnostic **length** can be gathered from the manufacturers device description.

Usually TIO modules, Momentum modules and DEA 203 modules require at most 6 bytes diagnostic entries.

A maximum of 13 bytes must be planned for TIO modules, 22 bytes for the DEA203 modules and 19 bytes for Momentum modules.

Diagnostic buffer memory utilization can be optimized through these two parameters. If the diagnostic buffer size is chosen so as to be too short, diagnostic data can be lost. When the maximum diagnostic entry length chosen is too short, longer diagnostic entries will not be accepted. The diagnostic data length is normally of a different length for every slave type (refer to the help text). When the maximum number of diagnostic entries selected is too small, diagnostic entries can be lost in borderline cases. Should however the diagnostic buffer size be dimensioned too liberally, then less memory will be available for I/O data communication.

For more information look at documentation in "Related Documents".

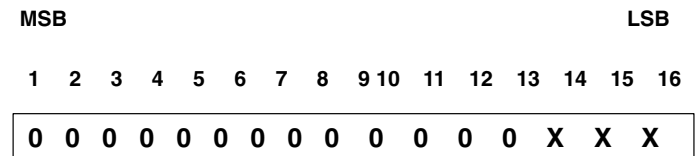
### Sign of life

Sign of life defines the 3x State RAM address for the CRP811 sign of life register. The sign of life register presents the bits 14–16 with the following meaning:

### Addendum for Documentaton Profibus DP Quantum/Modsoft Phase 3

#### CRP811 Sign of Life Register

Quantum 3xxxx Register configured with SPU931



<p><b>Static</b> 0 or 1:</p> <p><b>flashing:</b></p>	<p>None DP slaves running on Profibus</p> <p>One or more DP slaves running on Profibus</p>	<p>_____</p> <p>_____</p>
<p><b>Static</b> 0 or 1:</p> <p><b>flashing:</b></p>	<p>Not all DP slaves running on Profibus</p> <p>All DP slaves running on Profibus</p>	<p>_____</p> <p>_____</p>
<p><b>Static</b> 0 or 1:</p> <p><b>flashing:</b></p>	<p>CRP811 removed from the backplane or CRP811 faulty or CRP811 plugged into the backplane without running DP slaves on Profibus or Quantum powered on without running DP slaves on CRP811/Profibus</p> <p>CRP811 running on the backplane without problems</p>	<p>_____</p> <p>_____</p>




To apply the defaults

 –"Exit"

### 2.1.6 Control or Manual Correction of Input/Output Ranges

Assuming that the DP master for the slave nodes to be edited was selected:

 –"Edit", "Edit"  
or  
–"Edit", "Double-click on the highlighted PROFIBUS-DP master"



**PLC-01-Expert Mode ON**

Offsets:            0x00513                    1x00001                    3x00100                    4x00100  
 Ranges: 0x00513- 0x01008   1x00001- 1x01008   3x00100- 3x00800   4x00100- 4x02500  
 Free  
 Ranges: 0x00577- 0x01006   1x00177- 1x01007   3x00101- 3x00799   4x00100- 4x02491

Row No	Slave Adr.	Modul	Type	Input Range	Type	Output Range
1	3	-	bool	1x00033-1x00048		
2	4	-	bool	1x00049-1x00064	bool	0x00513-0x00528
3	5	-	bool	1x00065-1x00096		
4	6	-	bool	1x00097-1x00112		
5	7	-	bool	1x00113-1x00128	bool	0x00529-0x00544
6	8	-	bool	1x00129-1x00160		
7	9	1	bool	1x00161-1x00168		
8	9	2	bool	1x00169-1x00176		
9	10	1				
10	10	2				
11	10	3				
12	10	4			bool	0x00545-0x00576

Row No	Type	Length	Diagnostics	Module name
1	uint8	6	3x00020-3x00025	170 BDI 344 00
2	uint8	6	3x00026-3x00031	170 BDM 344 00
3	uint8	6	3x00032-3x00037	170 BDI 354 00
4	uint8	6	3x00038-3x00043	170 BDI 344 00
5	uint8	6	3x00044-3x00049	170 BDM 344 00
6	uint8	6	3x00050-3x00055	170 ADI 350 00
7	uint8	6	3x00056-3x00061	DEP208
8		0		DEP211
9	uint8	6	3x00062-3x00067	Config for Slot 1
10		0		Config for Slot 2
11		0		Config for Slot 3
12		0		6ES7 332-5HB0

Exit    Save    Cancel    Preset    Clear all    Help



**Note:** During address editing only the lower non-zero digits of the initial address are to be entered. When the address entry is accepted with <Return>, or <Save> the complete address will then be constructed. (For instance, 369 <Return> will result in 1x00369-1x00384.)

**Explanation of table columns (see above):**

- **Row No:** Successive row numbering.
- **Slave Address:** Display of the configured DP bus node addresses.
- **Module:** During employment of modular slaves the module number is indicated here (entry is performed under the SPU832 software).
- **Type:** Data types supported by the slave/module types are offered as choices. Valid for:
  - TIO slaves: either bool or register
  - DEA203: one of the types listed below depending upon the module type
  - Adaptable TIO: one of the types listed below depending upon the module type



- **Supported types:**
  - BOOL (0x..., 1x..., 3x ..., 4x ... references)
  - INT8
    - Input (3x.. upper byte sign-filled)
    - Output (4x..)
  - INT16 / 32 (3x ..., 4x ...)
  - UINT8
    - Input (3x.. upper byte "0" filled)
    - Output (4x..)
  - UINT16 / 32 (3x ..., 4x ...)
  - STRING
    - Input (3x.. )
    - Output (4x.. )
  - RAW
    - Input (3x.. )
    - Output (4x.. )

□ **Input/Output Range:**

- **Automatic mapping**

With every push of the preset button, the I/O mapping address ranges are entered automatically, beginning with the initial address specified in offset.  
Value range: refer to offset

- **Manual correction**  
The suggested values can be modified here within the address range (offset).

- **Diagnostics:**

- **Automatic mapping**  
With every push of the preset button, the specific slave diagnostic data are entered automatically, beginning with the initial address specified in offset.  
Value range: refer to offset
- **Manual correction** (only for selected Advanced mode)  
The suggested values can be modified here within the address freespace (offset).
- **Standard length:** 6 bytes in accordance with UINT8 storage.



**Note:** The permitted length can be gathered from the module description.

For Schneider Automation DP Slaves apply:

DP Slave Type	Max. number	Documentation No.
Classic Tios	8	
Momentum	19	870 USE 004 02
DEA 203	22	



**Warning:** Since the length of diagnostic data for the different modules is not contained in the device data base, no maximum length checking can be carried out.



**Preset:**

Preset is pushed:

When you push the preset, there will be an **automatic** assignment of the I/O signal addresses and slave node diagnostic words within Quantum state memory. The offset of these addresses within the Quantum memory should have been previously specified.

For the example preset is pushed.

**Clear:**

When you push the clear-button, the state ram addresses will be deleted; the signal type will not be changed.

**Configuration completion (closing files and leaving the menu)**



–"Exit", "Close"



**Note:** Now you will see the actual value of the parameter Cfg Extensions from Modsoft. In this example the value will be 188. See also page 35.

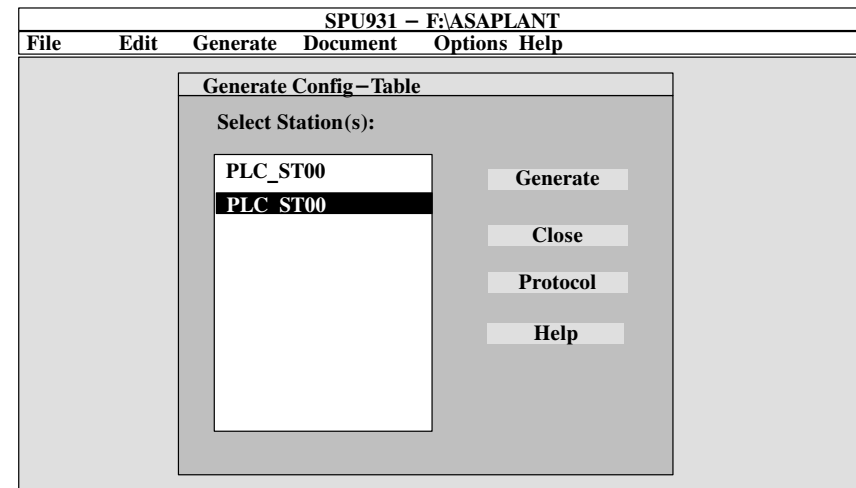
## 2.2 The Forwarding of Configured Data to Modsoft


---


### ”Generate Config–Table” to Update the CFG file

- Select ”desired station”
- ”Generate”

Select desired station from the list of offered stations and start generation with a click on the ”Generate”–button..




 **Note:** Select the protocol–button for checking the required ”cfg” extension size.

 **Note:** This value is an add–on to the actual value at the start of the Modsoft configuration. (see Figure 11 on page 35)

## 2.3 Printing Configuration Data

---

### Print the configuration


 –"Document", "Print"


Should the station contain DP data, then an offer to print this mapping data to printer will be made.

The document contains the following information:

- Bus type (DP)
  - Plant name (e.g. ASAPLANT)
  - PLC station name (e.g. PLC\_ST00)
  - Controller (option board) slot number, (e.g. 10)
  - Bus project directory (e.g. PLC\_ST00\DPPLC\_00)
- and
- Slave I/O mapping addresses for the DP bus resp.

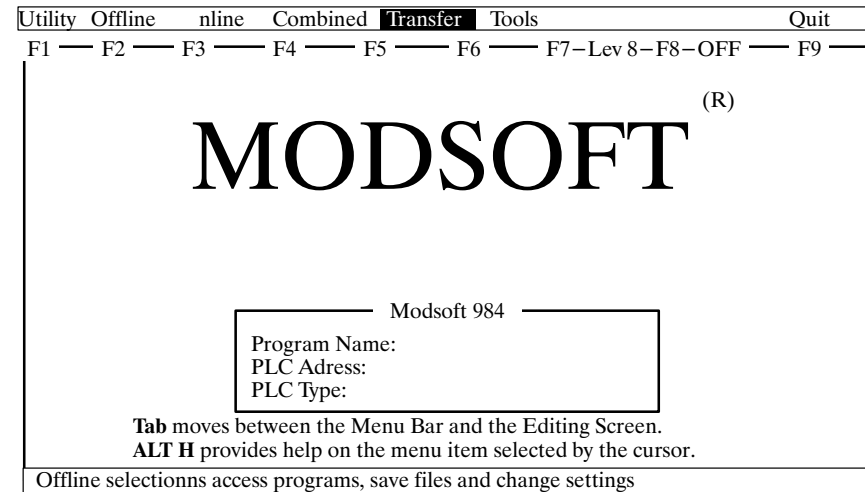



 **Note:** The final steps will now be carried out with Modsoft.

 **Note:** If not enough "Configuration Extension Size" has been reserved, an error message will be displayed.

## 2.4 PLC Loading of the CFG File

Loading under Modsoft (the station is already boot loaded)



 -"Transfer", "File to PLC"

**End of DP configuration**



---

# Part IV

## Index

---





# Index

---

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