SIEMENS

SIMATIC S5

S5-135U
CPU 928B - Version -3UB21

Programming Guide

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The CPU 928/CPU 928B/CPU 948, List of Operations, order no. 6ES5 997-3UA23, Rel. 01 is included with this manual.

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Introduction 1

Contents of the chapter

This chapter explains how to use the manual and deals with the areas of application of the S5-135U programmable controller with the CPU 928B and its structure. The chapter explains the typical mode of operation of a CPU and the structure of the CPU program.

You will also find a few suggestions about how to tackle programming and will learn some of the features of the CPU 928B (-3UB21) which are important for programming.

If you have already worked with the CPU 928B (-3UB11 or -3UB12) and would like to know the differences between these modules and the CPU 928B (-3UB21), refer to Section 1.8.

Overview of the chapter

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1.1 Area of Application for the S5-135U with the CPU 928B

Introduction to the SIMATIC S5 family

The S5-135U programmable controller belongs to the family of SIMATIC S5 programmable controllers. With the CPU 928B, it is the most powerful multiprocessor unit for process automation (open and closed loop control, signalling, monitoring, logging).

Owing to its modularity and high performance, it can be used for medium to extremely large control systems as well as for complex automation tasks at the plant and process supervision level.

Suitability

The S5-135U with the CPU 928B is particularly suitable for the following:

- Tasks requiring fast bit and word-oriented processing and fast reaction times, i.e. with extremely fast open and closed loop controls.

  Examples of this are fast processes in mechanical engineering (bottling plant, packing machines or similar systems) and in the automobile industry.

- Tasks requiring an extremely high storage capacity and fast access times, e.g. in the automobile industry, process and plant engineering.

- Tasks requiring fast communication with other CPUs installed in the PLC and operating in the multiprocessor mode and with CP modules (e.g. when connected to bus systems, host computers, for visualization, operation and monitoring).

- Complex tasks which can be handled efficiently and clearly using the high level languages C and SCL.

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1.8 What is New with the CPU 928B (-3UB21)?

Introduction The CPU 928B (-3UB21) offers you the following new functions and characteristics compared to the CPU 928B (-3UB12).

	CPU 928B (-3UB21)	CPU 928B (-3UB12)
Slot assignment	The CPU requires only one slot	The CPU requires two slots
Integrated RAM	RAM (internal RAM) integrated in the CPU with a capacity of 64 Kbytes	Pluggable RAM submodules with different memory capacities
Memory card	SIMATIC memory card (Flash EPROM)	Pluggable EPROM submodules
	The user program is copied from the memory card to the internal RAM for processing and is then read-only	The user program remains on the EPROM submodule for processing
DB 0 structure	Only after overall reset of CPU	After power on or overall reset of CPU
Floating point math	Mantissa with 24 bits	Mantissa with 16 or 24 bits

Extended cycle statistics The functions of the cycle statistics (OB 152) have been extended compared to the -3UB12 version, to include higher resolutions of the timers.

Software protection Via RS 139, a password can be assigned with which you can prevent unauthorized reading and editing of the user program in the CPU.

Programming the memory card A PG 7xx with S5-DOS from V6.x onwards is required to program the Flash EPROM memory cards. A program on an old memory submodule can be reprogrammed to a memory card.

Reloading the memory card If a Flash EPROM memory card is plugged when an overall reset is performed, the operating system copies the contents to the internal RAM and creates DB 0. The memory card is no longer required for operation.

EPROM mode Once the memory card has been reloaded (via overall reset), the user memory (address 0000H to 7FFFH) is write-protected for PG access and for write access by the user program. This corresponds to the behavior of a CPU 928B when an EPROM submodule is plugged.

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Influencing the write protection (RS 138) (OB 185)

The write protection can be set or removed specifically using two methods:

- by setting/resetting RS 138 before a cold restart of the CPU is completed (evaluated at the end of OB 20)
- by calling OB 185 in OB 20 (only possible here), the write protection is activated/deactivated immediately.

Compressing memory by means of user program (OB 186)

By calling OB 186, the PG function "compress memory" can be started by the user program. As the function may then collide with active PG jobs, OB 186 and PG functions are each blocked if the other is active.

Cycle time statistics (OB 152)

- The cycle time statistics are no longer linked to the cycle time monitoring, which means that there is no influence caused by restarting cycle time monitoring.
- As an alternative to the 1-ms resolution, the resolution can now be increased to 10 ms by means of a new function number.

Accessing the condition code byte OB 110

OB 110 can be used more frequently as the condition codes are no longer partly overwritten by the block call as they were previously.

EPROM memory check

The operating system now always run an EPROM memory check during power on. This means the OB 226 (read operating system word) and OB 227 (read checksum) have become superfluous. The blocks are still available for compatibility reasons, but both return the value 0.

New special function OBs

The CPU 928B-3UB21 has the following new special functions:

- OB 134 for the *D operation
- OB 135 for the /D operation
- OB 136 for the MOD operation
- OB 139 for the PUSH operation

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