ABC IT
FOR AUTOMATION

**User Manual**

# ABC-CPU Systems

**Commissioning**

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# 1. Commissioning

## 1.1 Central Modules

### 1.1.1 Setup and integration of the ABC-X-CPU-6 m57

The ABC-CPU is a central module for use in the automation systems of the SIMATIC S5-115U, 135/155U and 150U/S/K by Siemens. The module is programmed using Step5 and Step7 by Siemens and is suitable for restructuring and upgrading projects.


*Components of the module*

- Intel® Atom Processor N450, 1.66 GHz, 512 KB L2 Cache
- 4x integrated 10/100/1000 MBbps Ethernet interfaces
- 2GB memory on board
- 64 MB remanent Data
- For use in SIMATIC racks of 115U, 135/155U and 150U/S/K by Siemens
- Built-in Flash socket for SD cards
- 3 serial interfaces (1x TTY, 2x RS232)
- LED indicator for diagnosis

- Command compliant to S7-CPU 416 also in Mixed Mode as 416-945/948
- Quantity structure/Performance equates to S7-CPU417
- Compatible to S5-CPU 945/948
- Programming by standard Step5 and Step7
- Complete TCP/IP connection for linking of homogeneous and heterogeneous system components integrated

- High Performance (average 10ns/operation)
- Protocoll support ASCII, STX/ETX
- Open programming interface for implementation of customized function and data blocks
- PCS7-compatible CPU
- Direct visualization of process data via integrated graphics module

  Optionally
- Profibus, Profinet, EtherCat on board

#### 1.1.1.1 ABC-X-CPU-6 m57 for 115U System

The CPU must be installed in the rack with an adapter casing as required for the use of 135/155 peripheral components. Proceed as follows:

1) Ensure that the power supply unit for the rack is a 7/15A unit. 3A power supply units cannot be used.
2) The upper connecting strip at the back of the double adapter casing must be removed. The quadruple connector strip of the CPU requires this space for the connections.
3) Remove the Siemens CPU 941-945 and fasten the prepared adapter casing.
4) Fit the ABC-X-CPU-6 m57 in the adapter casing. Ensure that the module is fully inserted up to the mechanical limit.

#### 1.1.1.2 ABC-X-CU-6 m57 for 135U System

The CPU is integrated directly in one of the designated CPU slots. Multiprocessor operation is not possible. The function of the coordinator is also not supported. The CPU is provided with two 3 row connectors for making the connection to the backplane bus.

#### 1.1.1.3 ABC-X-CPU-6 m57 for 155U System

The CPU is integrated directly in one of the designated CPU slots. Multiprocessor operation is not possible. The function of the coordinator is also not supported. The CPU is provided with two 3 row connectors for making the connection to the backplane bus.

### 1.1.1.4 ABC-X-CPU-6 m57 for 150U/S/K System

The CPU 150 is designed for use in Simatic 150 systems. To install proceed as follows:

1) Remove the following components:

| ***Slot*** | ***Designation*** |
|---|---|
| 27 | Marshalling card 756 |
| 35 | CPU924 |
| 43 | CPU925 |
| 51 | CPU926 |
| 59 | CPU927 |
| 69/79 | PG-AS511 |
| 89/99 | AS512 |
| 79..117 | Memory 340 |

2) Fit the ABC-X-CPU-6 m57 for 150U/S/K system in slot 59 of the CPU927.

3) Please note, that the X-CPU-6 150 is only functional in the slot of the CPU927, even when slot markings are not distinguishable.

**Note!**
Older 150 systems have 4-row female connector strip on slot 59 (CPU927) that does not have a slit between three and four. In this case, the upper connector of the ABC-X-CPU-6 m57 must be modified accordingly.

**Note!**
The CPU and the PLC may be destroyed if the ABC-X-CPU-6 m57 150 is installed in a different slot to the one described.

### 1.1.2 Controls and Connections

## WARNING: Danger to life!!! Important safety instruction!!!

Please do not touch the back or bottom of the module. The module still holds a strong electric charge even when switched off and dismantled. Forced ventilation is in any case necessary.


## Controls and Connections X-CPU-6

### LEDs

| | | |
|---|---|---|
| RUN | GREEN | RUN operating status |
| | RED | STOP operating status |
| ERR | RED | Error |
| COM | GREEN | Communication |
| USR | GR/RD | User |

### Switch

| | |
|---|---|
| MRES | Activate overall reset after 5 seconds |
| STOP | Cyclical program processing off |
| RUN | Cyclical program processing on |

### Start-up behaviour

1. Power on
2. After 10 seconds → **COM** green
3. After 25 seconds → **RUN** green or red

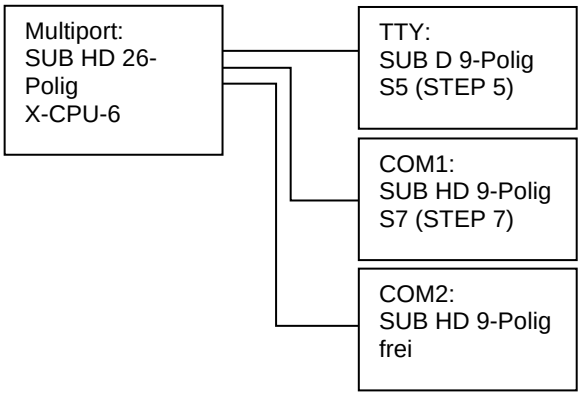
### Overall reset of module

The overall reset of the module takes place after 5 seconds of activating the MRES switch.

### Default IP-Addresses after overall reset

ETH1: 192.168.0.90; ETH2: 192.168.1.90
ETH3: 192.168.2.90; ETH4: 192.168.3.90

**Multiport cable**




## Ethernet connection

A network connection for the respective CP can be created at ETH1…ETH4.

## 1.1.3 Technical Data of the CPUs

| | | |
|---|---|---|
| *Mechanical dimensions* | | |
| | Height of front plate | 252,6 mm (6 U) |
| | Width of front plate | 40 mm (8 U) |
| | Weight | 780 g |
| *Electrical data* | | |
| | Power supply | 5 V ± 5% (4,85 V ... 5,24 V) |
| | Current consumption | 3,5 A |
| | Processor | Intel® Atom ™ Processor N450 |
| *Operating and display elements* | | |
| | Status LED | RUN, ERR, COM, USR |
| | Pushbutton | MRES, STOP, RUN |
| *Interfaces and slots on the front plate* | | |
| | Serial interfaces | 1x AS 511 (TTY) with DSUB 15<br>2x RS232 with DSUB 9 |
| | Ethernet | 4x 10/100/1000 Mbps. |
| | Mass memory | SD Card |
| | Expansion slots | Profibus, Profinet, EtherCat |

*S5 Interface*

| | |
|---|---|
| P and Q periphery incl. process image | Integrated |
| Page accesses for IM / CP modules | Integrated |
| Multimaster operation | Not provided |

*Ambient conditions*

| | |
|---|---|
| Operating temperature | 0 ... 60° C |
| Air humidity in operation | max. 90% rel. humidity, non-condensing |
| Storage temperature | -40 … 85° C |
| Air humidity during storage | max. 90% rel. humidity, non-condensing |
| Operating height above sea level | -300 m to 3000 m |
| Shock resistance | up to 20 g / 10 ms |
| Vibration resistance | up to 2 g / 10...500 Hz |

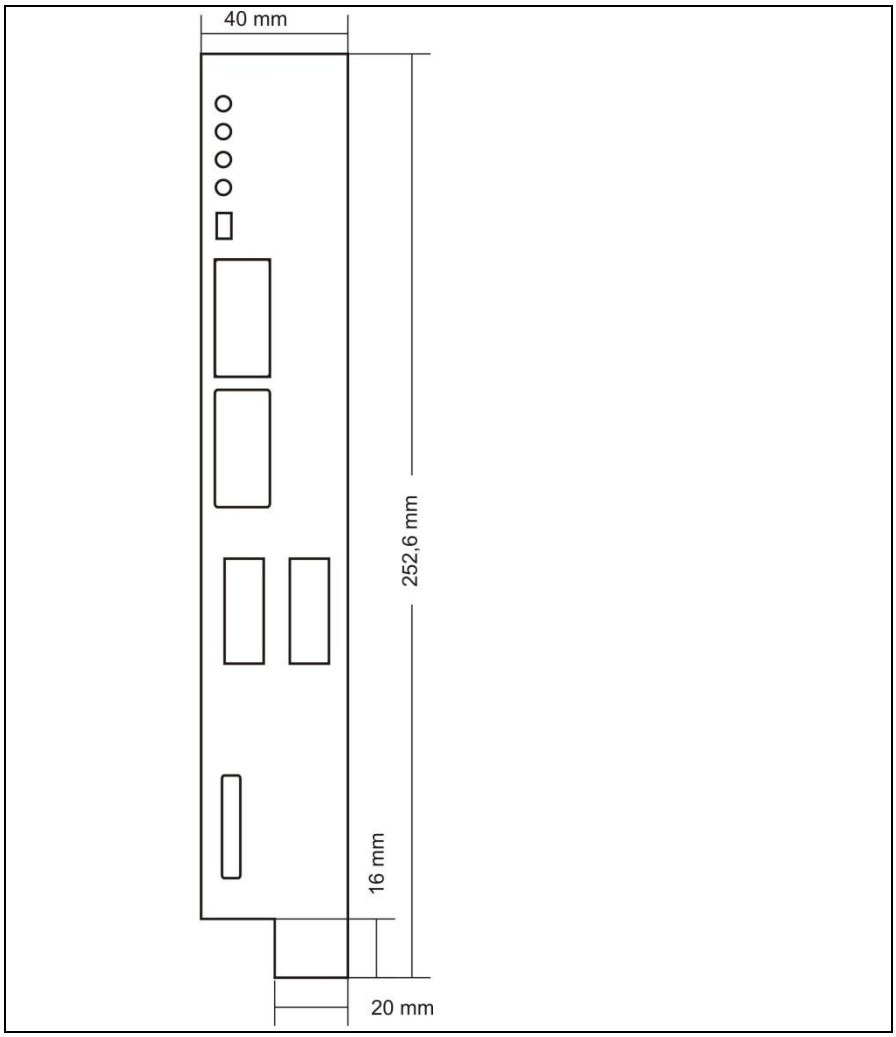
*EMC and ESD data*

| | |
|---|---|
| Susceptibility | in accordance with IEC 1000-4-2 (ESD)<br>in accordance with IEC 1000-4-4 (Burst) |
| Emissions | in accordance with EN55022, Part B |

*Safety*

| | |
|---|---|
| Flammability of PCB | In accordance with UL94V-0 manufactured by UL approved producers |
| Air humidity in operation | max. 90% rel. humidity, non-condensing |
| Storage temperature | -40 … 85° C |
| Air humidity during storage | max. 90% rel. humidity, non-condensing |

## 1.1.4 Dimensions




*Dimensions of the central modules*

## 1.2 Short instuctions / First steps

- Plug the ABC X-CPU-6 m57 into your central frame (115U with adaptation capsule, 135/155U, 150U). In the process, make sure that the ABC X-CPU-6 m57 is pushed entirely into the RACK. In the case of older racks, it is recommended that the contacts of the cable connector on the rack are clean.
- The ABC X-CPU-6 does not require a buffer battery for buffering.
- Switch on the central rack. The COM LED lights green after approx. 10 seconds. The RUN LED lights red or green after approx. another 25 seconds. The X-CPU-6 is now ready for operation.
- Carry out an overall reset. In the process, press the switch for 5 seconds in the MRES position. The COM LED and the RUN LED will thereby blink.
- Place the switch in the RUN position. The IP addresses are accepted. The default IP addresses are ETH1=192.168.0.90, ETH2=192.168.1.90, ETH3=192.168.2.90, ETH4=192.168.3.90 in the delivery status. These can be adjusted in the cmdline.txt file; see parameterisation documentation.
- In the case of the CPU versions CPU416, CPU416/945 and CPU416/948, the Samples.zip file is to be used as a template. Dearchive the Samples.zip file with the Simatic Manager. (The Samples.zip is a component of the delivery package or can be downloaded in the download area under www.abcit.eu)
- The programming device must be connected with the X-CPU-6 via Ethernet cable (RJ45). Alternatively, a connection can also be created with a null-modem cable (see online manual).
- The PG/PC interface of the Simatic Manager must be set to TCP/IP (see online manual).
- A connection with the X-CPU-6 can now be established. Transmit the HW config. The IP addresses can be adjusted in the HW config. Additional parameters can be found in the parameterisation manual.
- The X-CPU-6 can now be used.

# 1.3 System Software ABC X-CPU-6 Software

**Note!**

We wish to refer here to the relevant Siemens documentation for the individual CPU types**.**

Differences, special and additional features of the ABC-CPU software are described in the other chapters of the ABC-CPU systems manual.

## 1.3.1 ABC-CPU Hardware

### 1.3.1.1 Programming

The programming of the ABC-CPU software depends on the type of software used. The serial programming is carried out via the TTY and COM1 interfaces. Programming via Ethernet TCP/IP is described in detail in the online manual.

#### 1.3.1.1.1 ABC X-CPU-6 CPU945

Programming is carried out with the STEP5 programming package from Siemens via TTY (AS511) about Multiportkabel interface of the CPU. (The multi-port cable is included in the delivery)

For this the standard Siemens programming cable must be used or an alternative product from ABC IT (not supplied).

#### 1.3.1.1.2 ABC X-CPU-6 CPU948

Programming takes place with the STEP5 programming package from Siemens at TTY (AS511) via multiport cable to the CPU. (The multiport cable is a component of the delivery package)

For this the standard Siemens programming cable must be used or an alternative product from ABC IT (not supplied).

#### 1.3.1.1.3 ABC X-CPU-6 CPU416

Programming is carried out with the STEP7 programming package from Siemens via the COM1 interface of the CPU.

A null-modem cable is to be used for programming the STEP7 interface (COM1) via multiport cable. (The multiport cable is a component of the delivery package).

#### 1.3.1.1.4 ABC X-CPU-6 CPU416/945

Programming is carried out with the STEP5 and STEP7 programming package from Siemens via the TTY and COM1 interfaces of the CPU.

A standard programming cable from Siemens or an alternative product of ABC IT is to be used to program the STEP5 interface (TTY) via multiport cable. (The multiport cable is a component of the delivery package).

A null-modem cable is to be used for programming the STEP7 interface (COM1) via multiport cable. (The multiport cable is a component of the delivery package).

#### 1.3.1.1.5 ABC X-CPU-6 CPU416/948

Programming is carried out with the STEP5 and STEP7 programming package from Siemens via the TTY and COM1 interfaces of the CPU.

A standard programming cable from Siemens or an alternative product of ABC IT is to be used to program the STEP5 interface (TTY) via multiport cable. (The multiport cable is a component of the delivery package).

A null-modem cable is to be used for programming the STEP7 interface (COM1) via multiport cable. (The multiport cable is a component of the delivery package).