



**User Manual**

# **ABC-CPU Systems**

**Commissioning**

**22/2016**

© Copyright 2003-2016 by ABC IT, Ahrens & Birner Company GmbH

Virchowstraße 19/19a

D-90409 Nuremberg

Fon +49 911-394 800-0

Fax +49 911-394 800-99

<mailto:mail@abcit.eu>

<http://www.abcit.eu/>

ABC IT	is a registered trademark of ABC IT GmbH
Simatic	is a registered trademark of Siemens AG
STEP	is a registered trademark of Siemens AG

# Contents

1. Commissioning .....	4
1.1 Central Modules .....	4
1.1.1 Setup and integration of the ABC-X-CPU-2 m57 .....	4
Components of the module .....	4
1.1.1.1 ABC-X-CPU-2 m57 for 115U System .....	5
1.1.1.2 ABC-X-CU-2 m57 for 135U System .....	6
1.1.1.3 ABC-X-CPU-2 m57 for 155U System .....	6
1.1.1.4 ABC-X-CPU-2 m57 for 150U/S/K System .....	7
1.1.2 Controls and Connections .....	8
1.1.3 Technical Data of the CPUs .....	9
1.1.4 Dimensions .....	11
1.2 Short instructions / First steps .....	12
1.3 System Software ABC X-CPU-2 Software .....	13
1.3.1 ABC-CPU Hardware .....	13
1.3.1.1 Programming .....	13
1.3.1.1.1 ABC X-CPU-2 CPU945 .....	13
1.3.1.1.2 ABC X-CPU-2 CPU948 .....	13
1.3.1.1.3 ABC X-CPU-2 CPU416 .....	14
1.3.1.1.4 ABC X-CPU-2 CPU416/945 .....	14
1.3.1.1.5 ABC X-CPU-2 CPU416/948 .....	14

# 1. Commissioning

## 1.1 Central Modules

### 1.1.1 Setup and integration of the ABC-X-CPU-2 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.



- 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

*Components of the module*

- 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-2 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-2 m57 in the adapter casing. Ensure that the module is fully inserted up to the mechanical limit.

#### **1.1.1.2 ABC-X-CU-2 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-2 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-2 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:

<b>Slot</b>	<b>Designation</b>
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-2 m57 for 150U/S/K system in slot 59 of the CPU927.
- 3) Please note, that the X-CPU-2 150 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-2 m57 must be modified accordingly.



**Note!**

The CPU and the PLC may be destroyed if the ABC-X-CPU-2 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-2

#### 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.

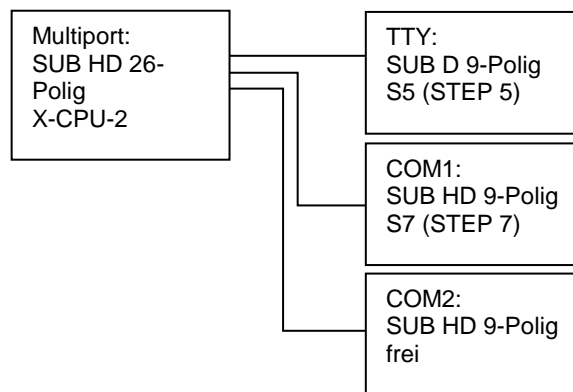
#### Default IP-Addresses after overall reset

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 $\pm$ 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 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

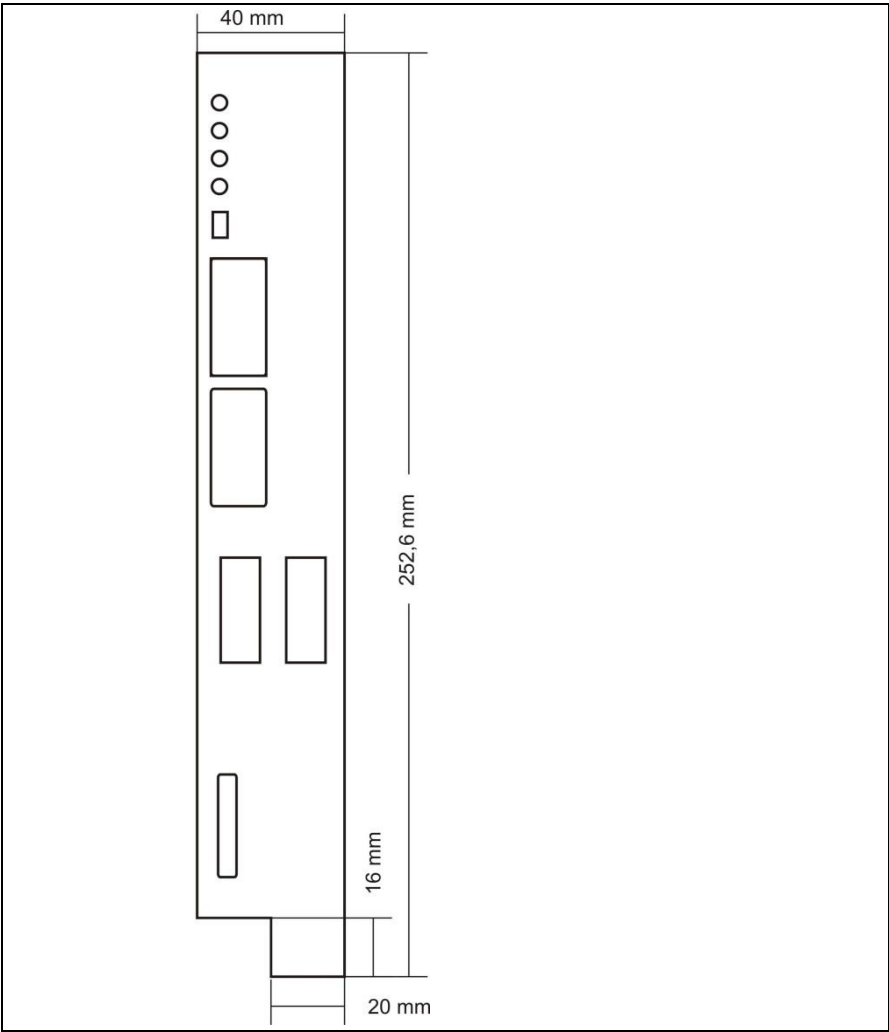
### *EMC and ESD data*

Susceptibility	in accordance with IEC 1000-4-2 (ESD) 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 instructions / First steps

- Plug the ABC X-CPU-2 m57 into your central frame (115U with adaptation capsule, 135/155U, 150U). In the process, make sure that the ABC X-CPU-2 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-2 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-2 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](http://www.abcit.eu))
- The programming device must be connected with the X-CPU-2 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-2 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-2 can now be used.

## 1.3 System Software ABC X-CPU-2 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-2 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-2 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-2 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-2 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-2 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).