



Documentation

ABC-CPU systems

ABC X-CPU-4 w57

20/2016

© Copyright 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. Introduction	4
1.1 ABC X-CPU-4 w57	4
2. Installation	5
2.1 Download	5
2.2 Cpu416_x86/x64_Ix	6
2.3 Dongle Runtime	6
2.4 Redistributable Packages for Visual Studio	6
3. Software	7
3.1 Network Connections	7
3.2 KeepAliveTime	8
3.3 Start parameter	9
3.4 Data handling	10
3.5 Processor cores	11
3.6 Multiple instances	12
3.7 Programming	13

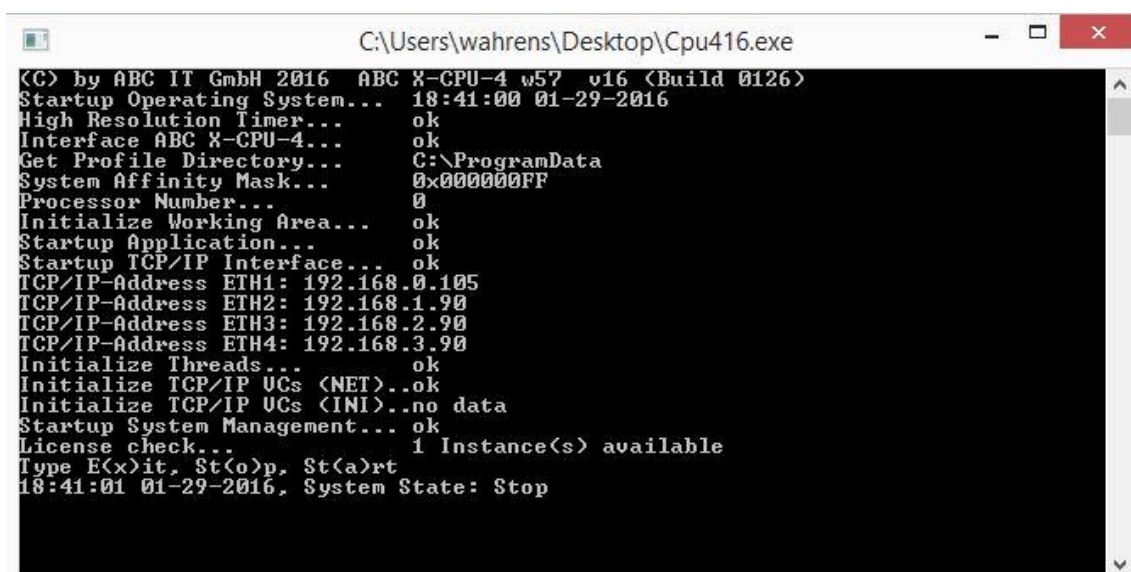
1. Introduction

1.1 ABC X-CPU-4 w57

The ABC X-CPU-4 w57 – software runs on the new Windows x86 and x64 operating systems. The software is programmed in TIA, PCS7, STEP7 and STEP5 by Siemens and is suitable as full High Feature CPU without restrictions for plant simulation and teaching.

Furthermore the software with hardware supplement (decentralized peripheral masters) can be used as non-deterministic compact controller for time critical processes.

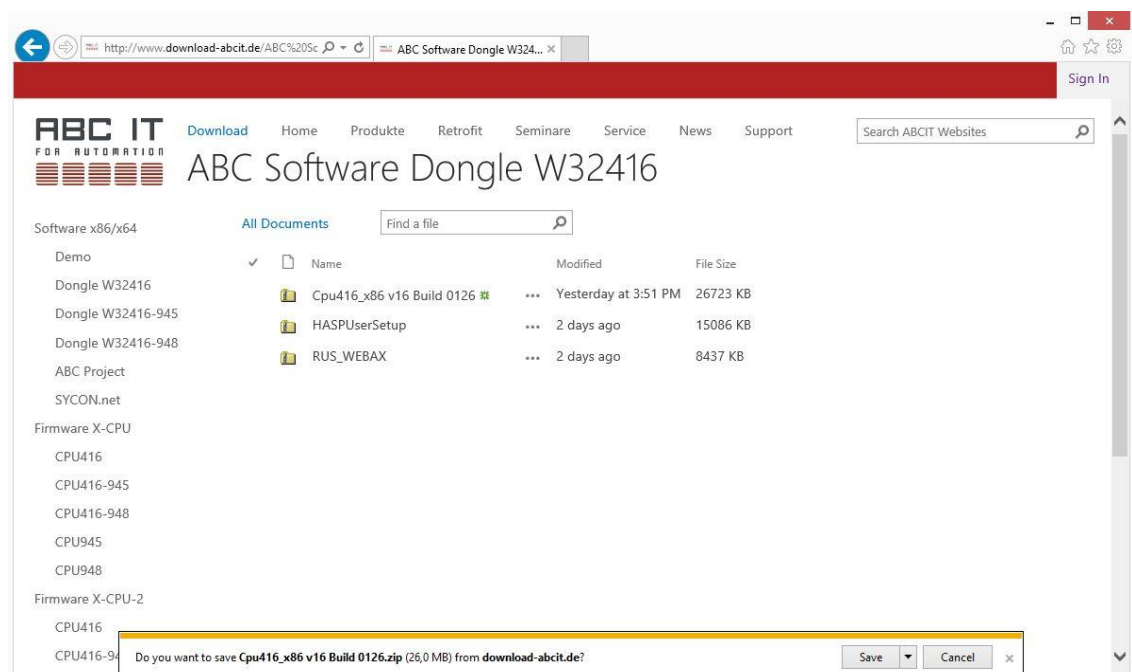
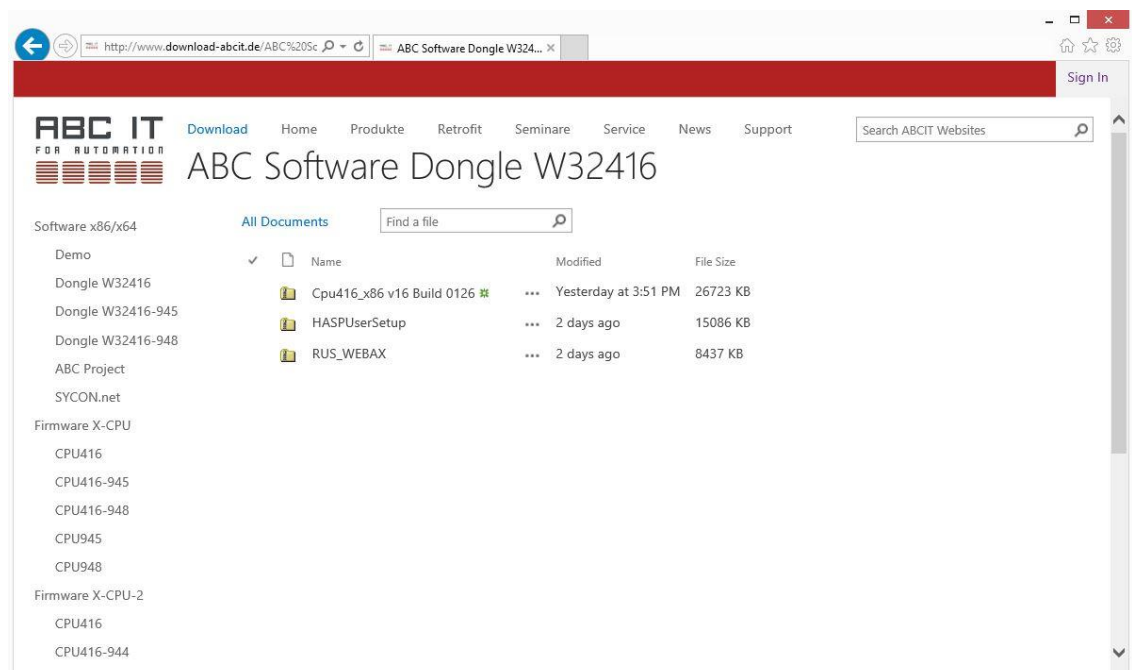
The software is dongle protected and instantable. That means on your Windows system, several PLC systems can be operated simultaneously. For that reason you only need one dongle.

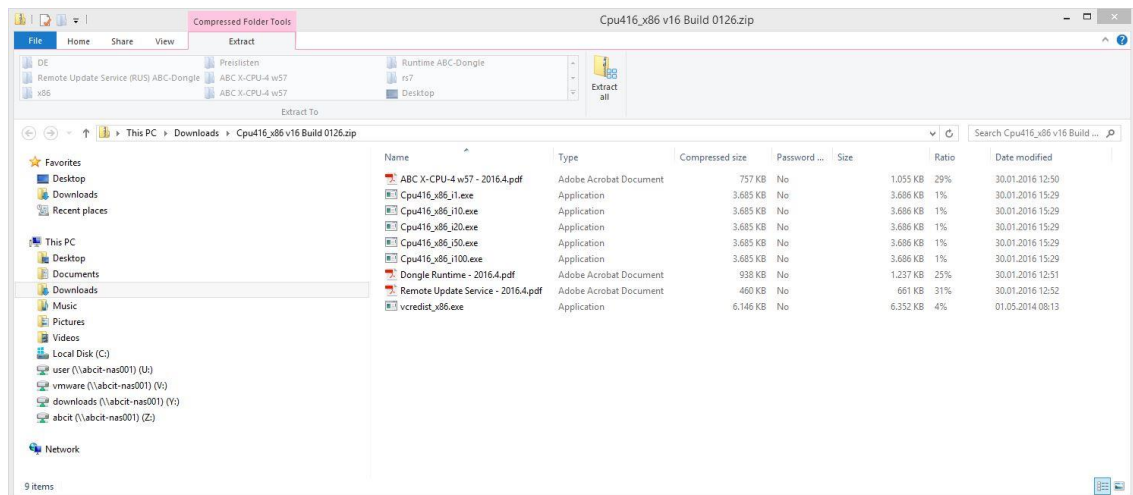
A screenshot of a Windows command prompt window titled "C:\Users\wahrens\Desktop\Cpu416.exe". The window displays the startup log of the ABC X-CPU-4 w57 software. The log text is as follows:

```
<C> by ABC IT GmbH 2016 ABC X-CPU-4 w57 v16 (Build 0126)
Startup Operating System... 18:41:00 01-29-2016
High Resolution Timer... ok
Interface ABC X-CPU-4... ok
Get Profile Directory... C:\ProgramData
System Affinity Mask... 0x000000FF
Processor Number... 0
Initialize Working Area... ok
Startup Application... ok
Startup TCP/IP Interface... ok
TCP/IP-Address ETH1: 192.168.0.105
TCP/IP-Address ETH2: 192.168.1.90
TCP/IP-Address ETH3: 192.168.2.90
TCP/IP-Address ETH4: 192.168.3.90
Initialize Threads... ok
Initialize TCP/IP UCs <NET>..ok
Initialize TCP/IP UCs <INI>..no data
Startup System Management... ok
License check... 1 Instance(s) available
Type E(x)it, St(o)p, St(a)rt
18:41:01 01-29-2016, System State: Stop
```

2. Installation

2.1 Download





2.2 Cpu416_x86/x64_lx

The software included in the package is *dongle protected*. Depending on what type of license you have purchased, you can start the Cpu416 – Software instantiated **x** times on one Windows station.

Read more about this in the following sections.

2.3 Dongle Runtime

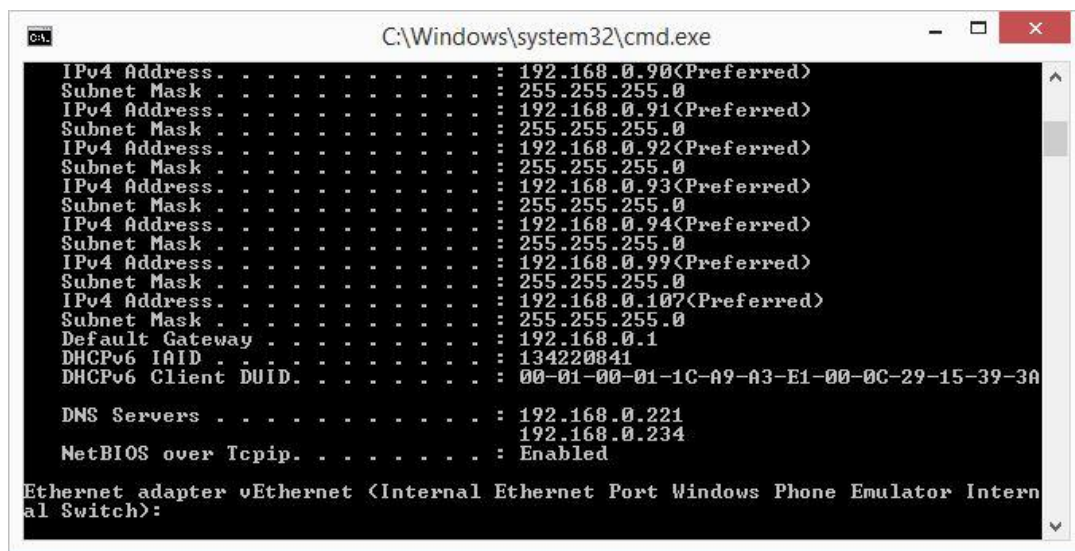
First, please install the dongle runtime from Sentinel according to the instructions.

2.4 Redistributable Packages for Visual Studio

Please install *vcredist_x86* or *vcredist_x64* by Microsoft.

3. Software

3.1 Network Connections

A screenshot of a Windows command prompt window titled "C:\Windows\system32\cmd.exe". The window displays the output of the "ipconfig" command, showing network configuration for several network adapters. The configuration includes IPv4 addresses, subnet masks, default gateway, DHCPv6 IAID, and DHCPv6 Client DUID. The network adapters listed are "Ethernet adapter vEthernet {Internal Ethernet Port Windows Phone Emulator Internal Switch}" and "Ethernet adapter vEthernet {Internal Ethernet Port Windows Phone Emulator Internal Switch}".

```
C:\Windows\system32\cmd.exe

IPv4 Address. . . . . : 192.168.0.90(Preferred)
Subnet Mask . . . . . : 255.255.255.0
IPv4 Address. . . . . : 192.168.0.91(Preferred)
Subnet Mask . . . . . : 255.255.255.0
IPv4 Address. . . . . : 192.168.0.92(Preferred)
Subnet Mask . . . . . : 255.255.255.0
IPv4 Address. . . . . : 192.168.0.93(Preferred)
Subnet Mask . . . . . : 255.255.255.0
IPv4 Address. . . . . : 192.168.0.94(Preferred)
Subnet Mask . . . . . : 255.255.255.0
IPv4 Address. . . . . : 192.168.0.99(Preferred)
Subnet Mask . . . . . : 255.255.255.0
IPv4 Address. . . . . : 192.168.0.107(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.0.1
DHCPv6 IAID . . . . . : 134220841
DHCPv6 Client DUID. . . . . : 00-01-00-01-1C-A9-A3-E1-00-0C-29-15-39-3A

DNS Servers . . . . . : 192.168.0.221
                       : 192.168.0.234
NetBIOS over Tcpip. . . . . : Enabled

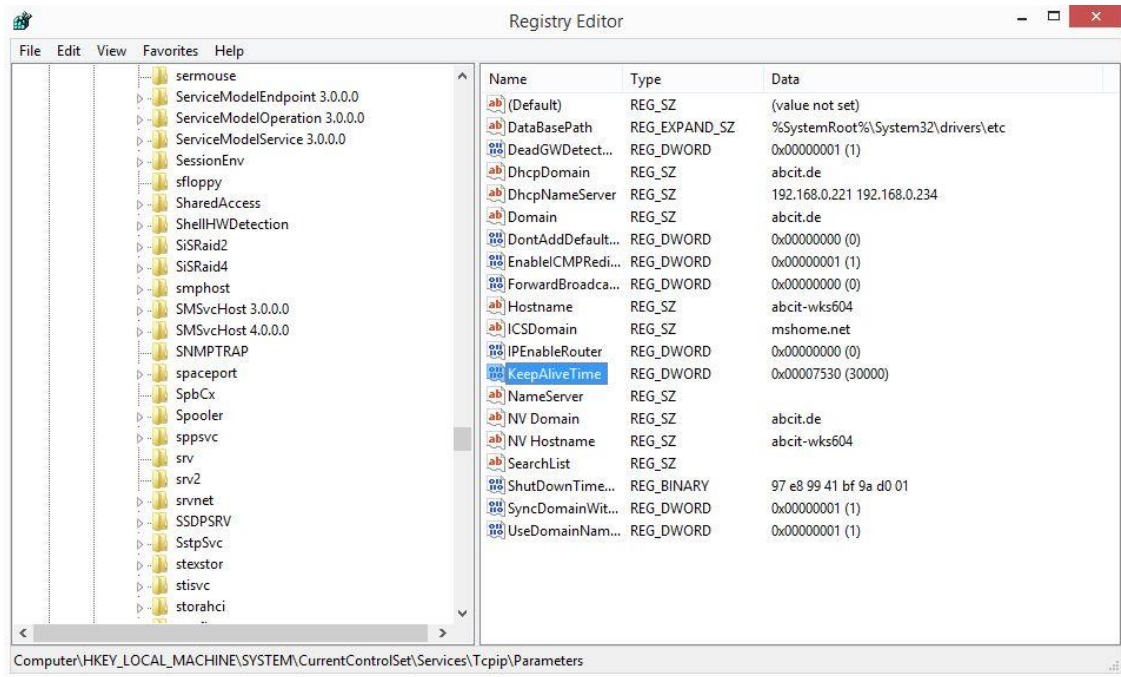
Ethernet adapter vEthernet {Internal Ethernet Port Windows Phone Emulator Internal Switch}:
. . . . .
```

The Windows system is configured with the following TCP/IP addresses:

- 192.168.0.90 bis 192.168.0.94
- 192.168.0.99
- 192.168.0.107

Seven ABC X-CPU-4 w57 instances run on this system.

3.2 KeepAliveTime



Please check the 'KeepAlive' entry in the registry. This is necessary for the connection monitoring with TCP/IP.

Start 'regedt32' Windows with administrator privileges. Then choose the path...

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters

Under parameters *KeepAliveTime* should be available with a value of 30000d. If not, create a new DWORD Value named *KeepAliveTime* and assign it to the value 30000d. Then quit all programs and restart the computer.

3.3 Start parameters

General parameters

-ADDR:192.168.0.90	Server with Instantiation on ETH1
-PATH:c:\tmp	Directory for data storage
-PROC:0	Processor allocation 0..31
-SWITCH:RUNP	RUN/RUNP/STOP/MRES; access protection
-MINCT:0	Minimum Cycle Time
-MAXCT:0	Maximum Cycle Time

Hardware Config

-CPUSlot:3
-CP1Slot:5
-CP2Slot:6
-CP3Slot:7
-CP4Slot:8

Identification S7-CPU

-CPUHWIdent:ABC-XCPU 100-1200-xx
-CPUSWIdent:ABC-RS_7 200-1050-14
-CPUHWVersion:3.2
-CPUSWVersion:16.1.26

Identification CP443-1 ETH1..4

-CP0HWIdent:ABC-XCPU 100-1200-xx
-CP0SWIdent:ABC-RS_7 200-1050-14
-CP0HWVersion:3.2
-CP0SWVersion:12.9.10

Ethernet TCP/IP parameter

-ETH1Addr:192.168.0.90
-ETH2Addr:192.168.1.90
-ETH3Addr:192.168.2.90
-ETH3Addr:192.168.3.90

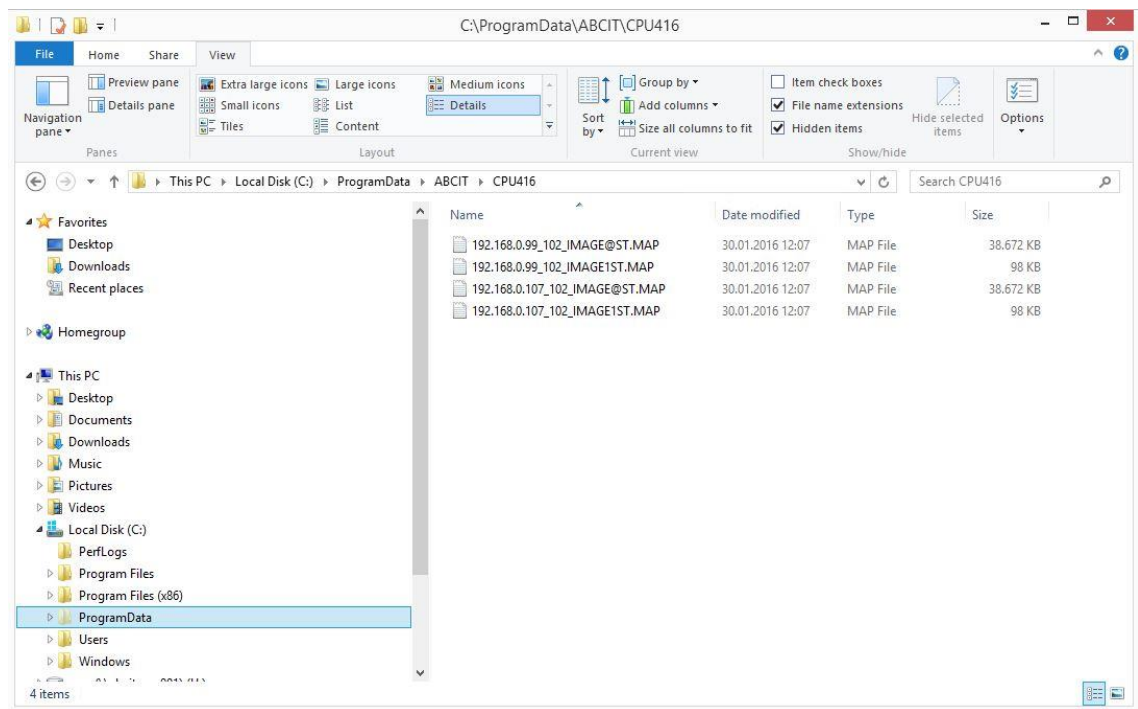
```
C:\Windows\system32\cmd.exe - cpu416 -ADDR:192.168.0.90 -PROC:0
(C) by ABC IT GmbH 2016 ABC X-CPU-4 w57 v16 (Build 0126)
Startup Operating System... 11:33:36 01-30-2016
High Resolution timer... ok
Interface ABC X-CPU-4... ok
Get Profile Directory... C:\ProgramData
-ADDR:192.168.0.90
-PROC:0
System Affinity Mask... 0x0000000F
Processor Number... 0
Initialize Working Area... ok
Startup Application... ok
Startup TCP/IP Interface... ok
TCP/IP-Address ETH1: 192.168.0.90
TCP/IP-Address ETH2: 192.168.1.90
TCP/IP-Address ETH3: 192.168.2.90
TCP/IP-Address ETH4: 192.168.3.90
Initialize Threads... ok
Initialize TCP/IP UCs (NET)...ok
Initialize TCP/IP UCs (INI)...no data
Startup System Management... ok
License check... 10 Instance(s) available
Type E(x)it, St(o)p, St(a)rt
11:33:37 01-30-2016, System State: Stop
11:33:43 01-30-2016, System State: Run
```

These ABC X-CPU-4 w57 instance runs on the processor core 0 and is to reach under the TCP/IP - address 192.168.0.90.

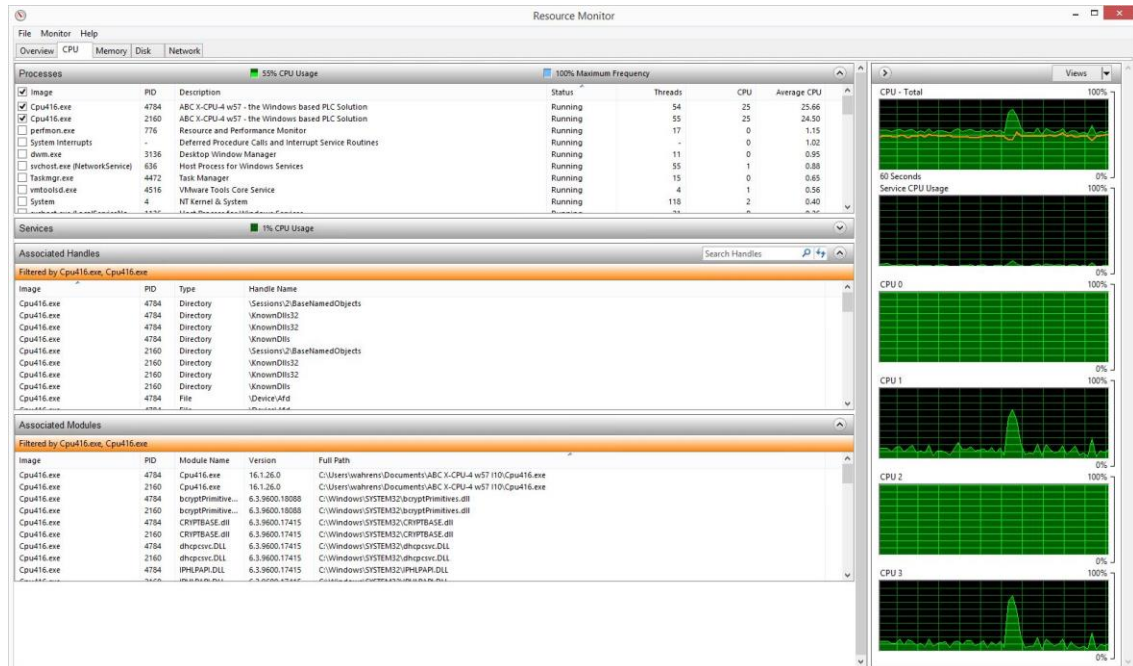
3.4 Data Handling

If no PATH-assignment is made, the data is saved under C:\ProgramData\ABCIT\... after exiting the ABC X-CPU-4w57 instance. After a new start of the instance with the same parameters, the data will be read again and the control program runs with the current stored values.

The file is written even if the instance is not completed properly, the user logs off, or Windows machine will be shut down.



3.5 Processor cores



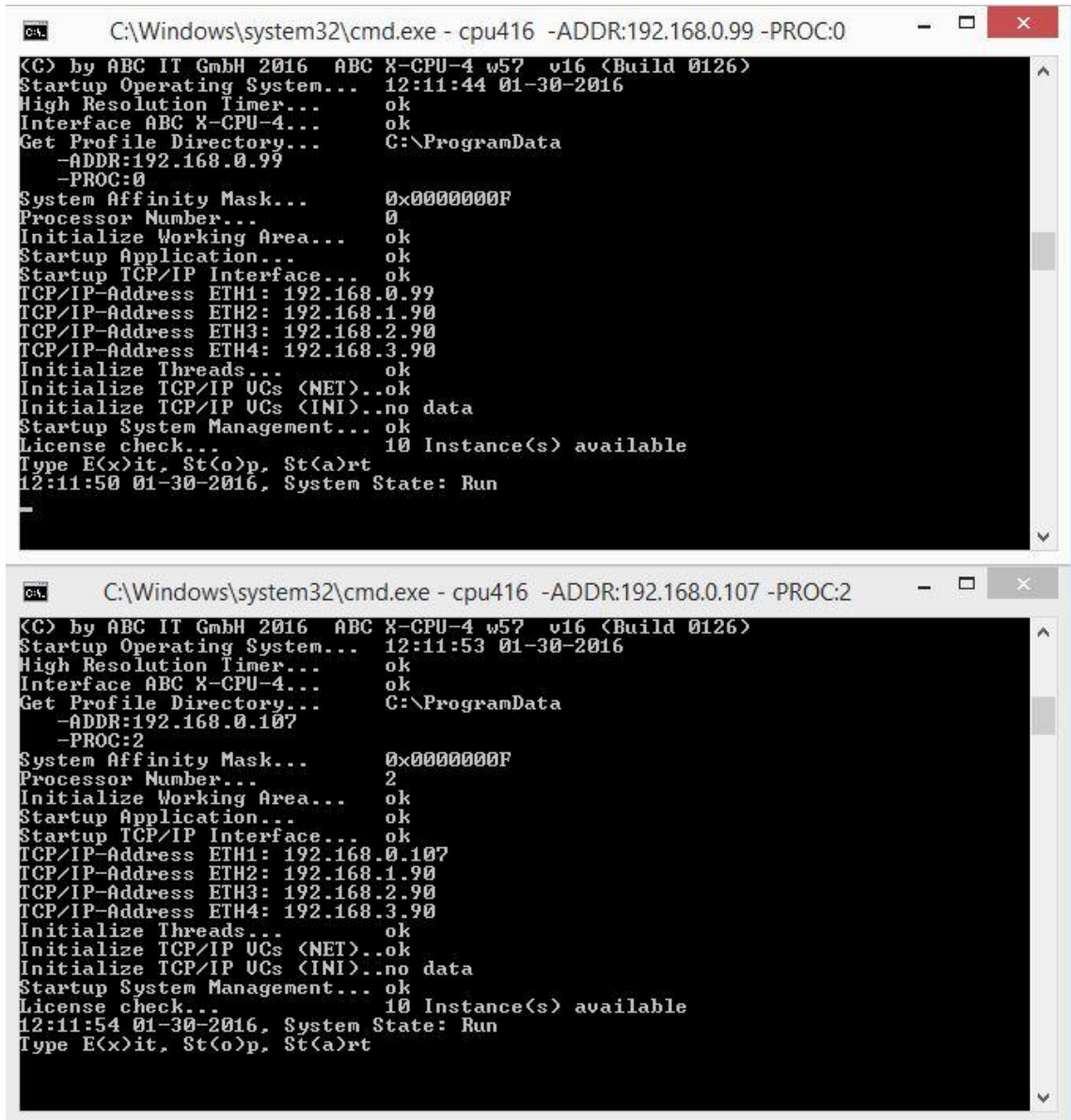
If no PROC – allocation occurs, the X-CPU-4 w57 instances will be bound on the CPU 0.

In this example, run two X-CPU-4 w57 instances that are bound to CPU 0 and CPU 2.

However, it is also possible to attach multiple instances on one CPU. In this case, the cycle time is increased according to the number of instances.

In any case the CPUs of the Windows system are utilized 100 % with the X-CPU- 4 w57 instances.

3.6 Multi-instances



```
C:\Windows\system32\cmd.exe - cpu416 -ADDR:192.168.0.99 -PROC:0

(C) by ABC IT GmbH 2016 ABC X-CPU-4 w57 v16 (Build 0126)
Startup Operating System... 12:11:44 01-30-2016
High Resolution Timer... ok
Interface ABC X-CPU-4... ok
Get Profile Directory... C:\ProgramData
-ADDR:192.168.0.99
-PROC:0
System Affinity Mask... 0x0000000F
Processor Number... 0
Initialize Working Area... ok
Startup Application... ok
Startup TCP/IP Interface... ok
TCP/IP-Address ETH1: 192.168.0.99
TCP/IP-Address ETH2: 192.168.1.90
TCP/IP-Address ETH3: 192.168.2.90
TCP/IP-Address ETH4: 192.168.3.90
Initialize Threads... ok
Initialize TCP/IP UCs (NET)..ok
Initialize TCP/IP UCs (INI)..no data
Startup System Management... ok
License check... 10 Instance(s) available
Type E(x)it, St(o)p, St(a)rt
12:11:50 01-30-2016, System State: Run

C:\Windows\system32\cmd.exe - cpu416 -ADDR:192.168.0.107 -PROC:2

(C) by ABC IT GmbH 2016 ABC X-CPU-4 w57 v16 (Build 0126)
Startup Operating System... 12:11:53 01-30-2016
High Resolution Timer... ok
Interface ABC X-CPU-4... ok
Get Profile Directory... C:\ProgramData
-ADDR:192.168.0.107
-PROC:2
System Affinity Mask... 0x0000000F
Processor Number... 2
Initialize Working Area... ok
Startup Application... ok
Startup TCP/IP Interface... ok
TCP/IP-Address ETH1: 192.168.0.107
TCP/IP-Address ETH2: 192.168.1.90
TCP/IP-Address ETH3: 192.168.2.90
TCP/IP-Address ETH4: 192.168.3.90
Initialize Threads... ok
Initialize TCP/IP UCs (NET)..ok
Initialize TCP/IP UCs (INI)..no data
Startup System Management... ok
License check... 10 Instance(s) available
12:11:54 01-30-2016, System State: Run
Type E(x)it, St(o)p, St(a)rt
```

3.7 Programming

For simplicity, please make sure that the ABC X-CPU-4 w57 – Software is only put into operation on Siemens free systems (no STEP5/7, no TIA, no PCS7,...) . Port 102 must not be used by any other software!

Feel free to download STEP7-Samples on our download-page on www.abcit.eu .

HW Config [X CPU 3 w57 (Konfiguration) -- S7]

Station Bearbeiten Einfügen Zielsystem Ansicht Extras Fenster Hilfe

Suchen:

Profil: Standard

- PROFIBUS-DP
- PROFIBUS-PA
- PROFINET IO
- SIMATIC 300
- SIMATIC 400
- SIMATIC PC Based Control 300/400
- SIMATIC PC Station

DP-Mastersystem (1)

(111) WAGO

DP-NORM

Steckplatz	Baugruppe	Bestellnummer	Firmware	MPI-Adresse	E-Adresse	A-Adresse	Kommentar
1	PS 407 10A	6ES7 407-0KA02-0AA0					
3	CPU 416-2 DP	6ES7 416-2XN05-0AB0	V5.3	2			
X2	DP				16380*		
X1	MPI/DP			2	16382*		
4							
5	CP 443-1 ETH1	6GK7 443-1EX20-0XE0	V2.1		16379*		
X1	PN/IO				16383*		
X1 P1 R	Port 1				16377*		
X1 P2 R	Port 2				16376*		
6	CP 443-1 ETH2	6GK7 443-1EX20-0XE0	V2.1		16381*		
X1	PN/IO				16378*		
X1 P1 R	Port 1				16375*		
X1 P2 R	Port 2				16374*		
7							
8							
9							

PROFIBUS-DP-Slaves der SIMATIC S7, M7 und C7 (dezentraler Aufbau)

Drücken Sie F1, um Hilfe zu erhalten.

