



**Automations- und  
Steuerungstechnik GmbH**

**User manual**

# **CCEIB SPS**



**The control unit for the EIB**

**Order code: E001-K015001**

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This handbook describes also functions, which are options.  
Only qualified persons are allowed to install our units.

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## Contents

<b>Highlights CCEIB SPS.....</b>	<b>6</b>
<b>Fields of application for the CCEIB SPS .....</b>	<b>6</b>
<b>Package contents of the CCEIB SPS.....</b>	<b>6</b>
<b>Introduction.....</b>	<b>7</b>
<b>View CCEIB SPS (flange mounted).....</b>	<b>8</b>
<b>View CCEIB SPS (DIN-rail-mounted) .....</b>	<b>9</b>
<b>Setting of physical address of the CCEIBSPS: .....</b>	<b>10</b>
<b>Changing the CCEIB SPS IP address.....</b>	<b>10</b>
<b>Add/change a new/existing CCEIBx.....</b>	<b>11</b>
<b>Setting the IP address of flange mounting units .....</b>	<b>12</b>
<b>Setting the IP address of DIN-rail-mounting units.....</b>	<b>13</b>
<b>CCEIB SPS quickstart „Step by step“ .....</b>	<b>14</b>
<b>Additional CCEIBSPS informations.....</b>	<b>17</b>
<b>Networking interface .....</b>	<b>17</b>
<b>Firmware Updates .....</b>	<b>18</b>
<b>Network ports of the EIBSPS .....</b>	<b>20</b>
<b>EIBSPS RTC time synchronization.....</b>	<b>21</b>
<b>Usage of the programming button .....</b>	<b>22</b>

## Highlights CCEIB SPS

- Direct coupling to EIB (two-wire)
- Coupling of any EIB-world to intranet/Internet over TCP/IP
- DIN-rail-mounting
- Firmwareupdates via network possible
- Stackability
- Direct coupling to FIAVis (FIAVis Commander, OPCServer, FIAVis.VB)
- Direct coupling to the virtual Control-Panel EIB Control Platform
- Separate OPC-Server available
- All groupaddresses are permanently monitored and this makes all actual values available at login!
- Full read- write access to groupaddresses
- Explicit polling of the actual values of groupaddresses possible
- Additional management of up to 2048 object addresses (central functions)
- Large function library for creating control programs. Own functions can be added to the library.
- Options: Remanent variable-memory and RK512 connection

## Fields of application for the CCEIB SPS

- Realisation of nearly every complex function with the EIB
- Remote controlling by an ISDN Router
- Server for the EIB-Control-platform
- Networkgateway for visualizations (direct connection or per OPC)
- Bundling of bit-telegrams to word-telegrams to discharge the EIB

## Package contents of the CCEIB SPS

- CCEIB SPS with network-interface and firmware
- FIAVis Manager, graphical projection tool for CCEIB SPS
- For support of older non-FIAVis-projects the EIB Explorer can also be installed
- Cross-Over TP cable (no HUB is needed)
- Documentation

## Introduction

The FIAVis Manager is the central tool for creating EIBSPS projects: with the FIAVis Manager the projection information is generated for the FIAVis data pool (and so FIAVis Visualizations, OPC-Server, etc).

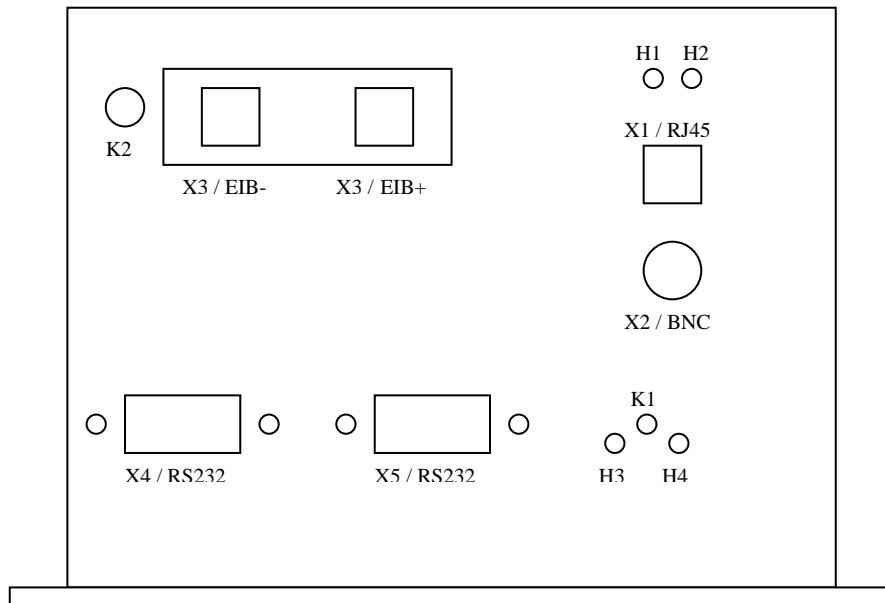
The FIAVis Manager manages projects for:

- „CCEIBGW“: the universal network-EIB Gateway
- „CCEIBSPS“: the intelligent processing unit in the EIB incl. network-gateway functionality
- „EIBWeiche“: the fast serial/USB buscoupler with simple protocol
- „EIBNet/IP-Router“: connection over network to the EIB

The configuration of a FIAVis data pool as well as the parameterization of the process items and (in the case of an EIBSPS) logic programs via FIAVis Manager is described in detail in the FIAVis user manual.

EIBSPS-device connections and additional software-tools (for setting the IP-address of a EIBSPS, Firmware-Updates, Information to the network protocol, etc) are described in this manual.

## View CCEIB SPS (flange mounted)



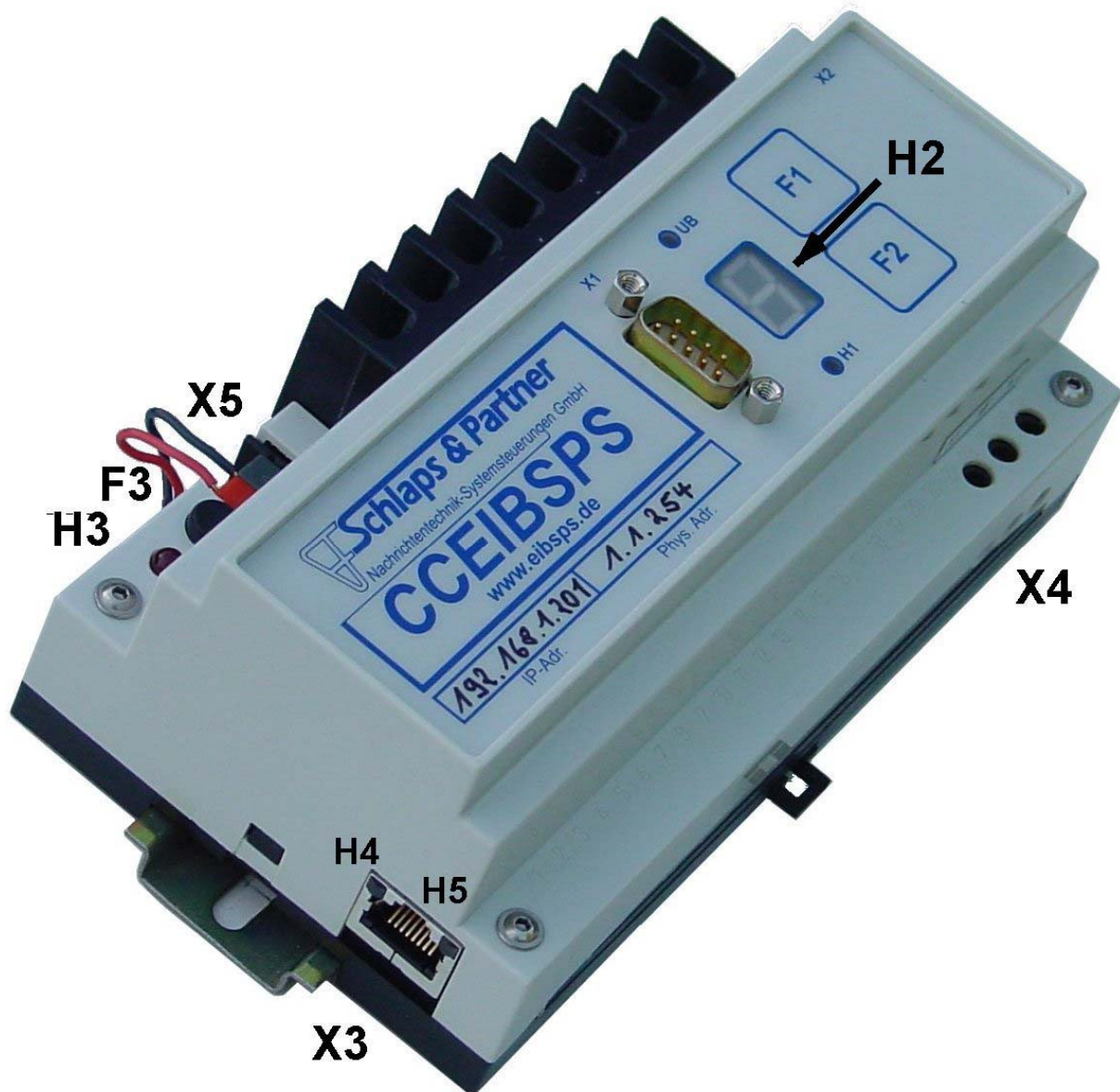
X1 / RJ45 TP connector (RJ45)  
 X2 / BNC BNC connector (Coax RG58)  
 X3 / EIB+/- EIB connection (EIB plus/minus)  
 X4 / RS232 RS232 interface (optional)  
 X5 / RS232 RS232 interface (optional)

K1 Programming switch (IP address)  
 K2 Programming switch (physical address EIB)

H1 Network LINK (only on TP connection over RJ45)  
 H2 Network packets (receiving / sending network packages)  
 H3 EIBSPS state led (usually blinking in 250ms frequency)  
 H4 EIBSPS state led (blinking while programming the IP address or if an error is detected)



## View CCEIB SPS (DIN-rail-mounted)



X1	serial connector (e.g. for printer, GSM, other PLC)
X2	optional serial connector
X3	network connector, 10/100MBit Ethernet
X4	mains connector 230V~
X5	EIB 2-wire connector
UB	power supply LED
H1	status-LED
H2	statusdisplay (7-segment)
H3	program-LED physical address
H4	activity-LED
H5	Ethernet-link-LED
F1	function key 1
F2	function key 2
F3	program key physical address

## Setting of physical address of the CCEIBSPS:

There are 3 different types of CCEIBGW, CCEIBSPS und CCEIBR. Please check kind of device as follows:

If your device has a plastic case with a 7-segment display on top for DIN-RAIL-mounting, it's device type 1.

If your device has a metal case for flange mounting, you have device type 2 or 3.

To look, if it's type 2 or 3 plug in the main cable and don't connect the EIB.

Press the red button beside the EIB-connectors. When the button lights, you have device type 3 else you have device type 2.

### Device type 1:

Method 1: disconnect the device (CCEIBx) from the power supply.

Method 2: If you cannot disconnect the device (CCEIBx), please check if a line at the 7-segment-display circles around. Press F2-key and keep it pressed. The display counts down from 5 to 1. After the display has shown "1" release the F2-key. Press the F1-key until the countdown begins. Release the F1-key before the countdown reaches "1". LED "H1" is lightened and a line at the 7-segment-display circles around.

Press the black program-key nearby the EIB-connector. After about 45 seconds the program-led nearby the EIB-connector gets dark. Other possibility: simply disconnect/reconnect the EIB wires. Both ways will reset the internal bus coupler.

Now select a serial device in the ETS (for example a serial buscoupler which is used to program EIB-devices) and place it into the line (only in ETS!). ETS gives this device a physical address. Program with ETS the physical address. The unit now runs with the new physical address.

### Device type 2:

Disconnect the device (CCEIBx) from mains and wait until all LEDs are darken. Disconnect the device also from EIB and wait more than 10 seconds. Now connect the device only to EIB, not to mains! Select in ETS a serial bus-coupler (such as you use to program devices) and give it a physical address. Our product database contains only dummy devices to generate filter tables for the line couplers and are not usable to set a physical address. Press the red program button (lights after pressing) and program the physical address. After this procedure you can easily plug in the CCEIBx to 230V-mains.

### Device type 3:

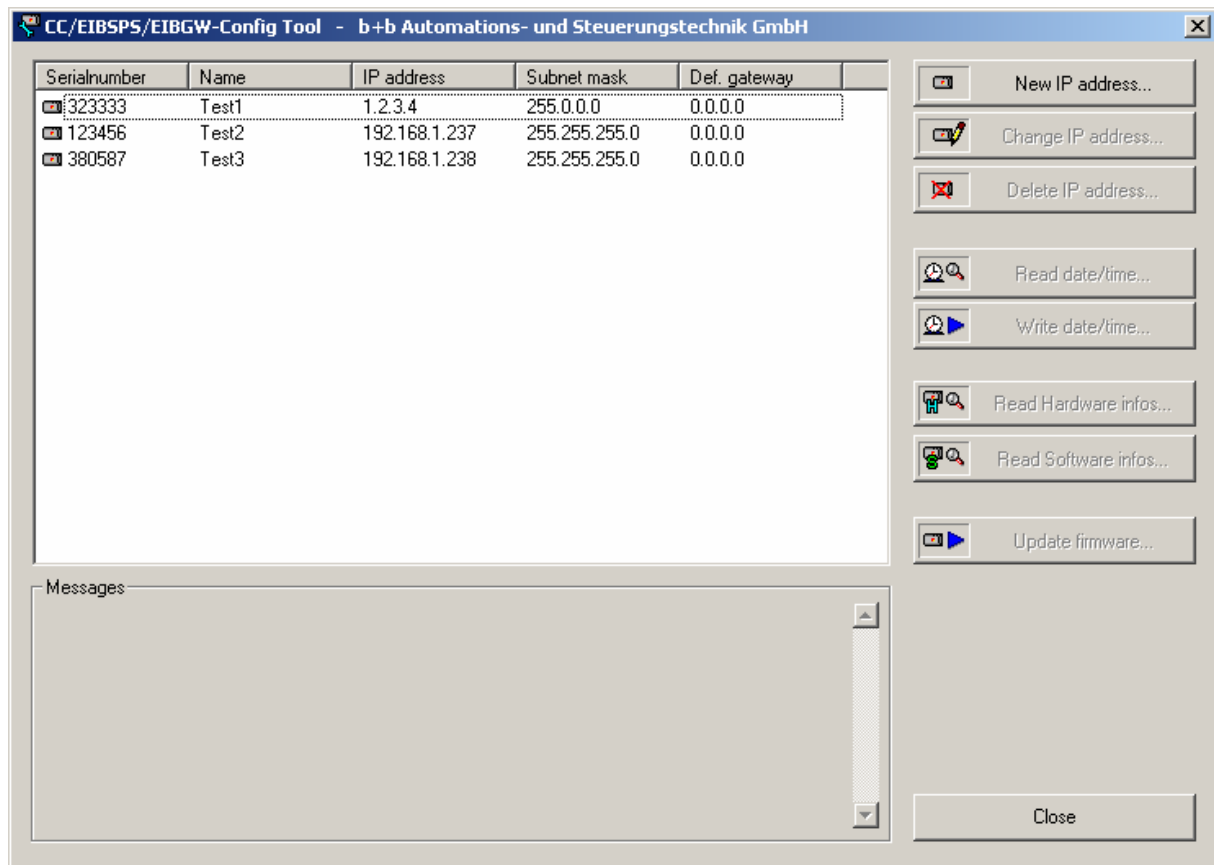
Plug the device (CCEIBx) into 230V-mains and connect it to EIB. Select in ETS a serial bus-coupler (such as you use to program devices) and give it a physical address. Our product database contains only dummy devices to generate filter tables for the line couplers and are not usable to spend a physical address. Press the red program button (lights after pressing) and program the physical address.

## Changing the CCEIB SPS IP address

If you want to change the IP address of your CCEIBx Controller device, you have to connect the device to a network, the PC has to be connected to the same network. The communication will be done by using the TCP/IP protocol. You can look into the 'EIB Tools' help for details about the configuration of networks.

To change the IP address of the device, you have to start up the "EIBSPS/EIBGW/EIBRouter config tool" (CCCONFIG.EXE), or the older 16 bit application "IP Address Manager"/"IP config tool" (IPCFG.EXE).

After starting up the configuration tool, the following window will appear:



All defined CCEIBx will be listed. The list will be empty on the first start.

Each list entry displays the serial number, an optional name, and the IP address settings.

You can define a new CCEIBx by pressing **"New IP address..."**

You can change an existing CCEIBx by selecting it in the list and pushing **"Change IP address..."**.

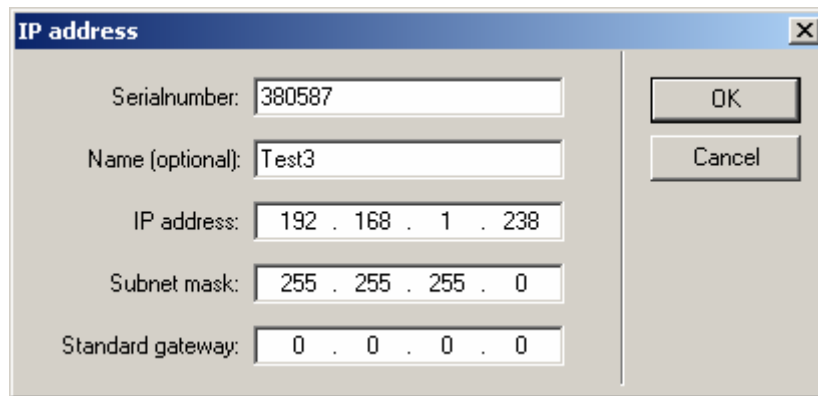
The button **"Delete IP address"** removes the selected list entry.

The next following buttons (Read date/time, write date/time, read hardware/software infos, update firmware) are not important for changing the IP address, they will be explained later.

The button **"Close"** is closing the tool.

## Add/change a new/existing CCEIBx

The following dialog is displayed:



Enter the serial number in the first edit field. You can find the serial number written on your CCEIBx device.

The next field is an optional name (for example "Building 1").

Now enter the IP address you want to use for your CCEIBx.

If your subnet mask is different from the default one, you can change it.

If you have a default gateway in your network, you should enter its IP address.

**"OK"** will save your settings.

**"Cancel"** closes the window without saving.

## Setting the IP address of flange mounting units

1. **Step:** Disconnect the power cord of the CCEIBx. Push the programming button (that's the small button between the red and green led). Don't release the button yet.
2. **Step:** Connect the power cord again (without releasing the programming button). The CCEIBx start up, the red led starts blinking.
3. **Step:** When the red led stops blinking you can release the programming button. A message appears in the Configuration Tool. The CCEIBx has now stored the IP address. Verify the IP address with a ping command.

The IP address is stored in the CCEIBx until a new address will be programmed.

If the CCEIBx doesn't get the IP address, one of the following situations was happening:

- The chosen IP address already exists
- The chosen IP address is not available in your network (different sub nets)
- The chosen IP address or the subnet mask is not valid

- The CCEIBx is connected by a router and the gateway address is not valid or the router cannot be found or the router cannot resolve the address
- A router or switch device is blocking network broadcasts

You should contact your network administrator. Please read also the introduction to TCP/IP.

## Setting the IP address of DIN-rail-mounting units

Connect the device (CCEIBx) into mains and wait until a line at the 7-segment-display circles around. Press F2-key and keep it pressed. The display counts down from 5 to 1. After the display has shown "1" release the F2-key. Press the F1-key until the countdown reaches "1" again. The CCEIBx gets it's new IP-address from the PC. After that release F1-key.

If the CCEIBx doesn't get the IP address, one of the following situations was happening:

- The chosen IP address already exists
- The chosen IP address is not available in your network (different sub nets)
- The chosen IP address or the subnet mask is not valid
- The CCEIBx is connected by a router and the gateway address is not valid or the router cannot be found or the router cannot resolve the address
- A router or switch device is blocking network broadcasts

You should contact your network administrator. Please read also the introduction to TCP/IP.

## CCEIB SPS quickstart „Step by step“

You will find here a collection of steps, describing how to use the EIBSPS the first time. Step 14ff will give you additional hints how to handle the EIBSPS.

1. You need a PC with Win95/98/Me/NT/2000 operating system. Please connect the CCEIB-SPS to the network, and be sure you have correctly installed the TCP/IP drivers for your PC. Please consider, that an existing network-firewall can prevent the communication between PC and SPS.
2. Like a PC the CCEIB-SPS needs an unique IP-address. To tell the CCEIB SPS an address, you have to start the program "CC configuration tool", or the older „IP configuration tool “. With this programs you define for the serial number of the SPS an IP-address. The address should of course fit to the subnet of your PC!  
Flange mounted: While the program is open you have to switch off the SPS, press the small program button of the SPS and then switch the SPS on again (keep pressing the button). After the red LED has blinked up to five times a message must appear in the IP configuration tool. Now the SPS is ready for use under the wanted address!  
DIN-rail mounted: per „F2“ key boot the SPS (counts from 5 to 1, if 1 disappeared, release key F2), and then per pressed „F1“ key set the IP-address (also counts from 5 to 1, after the 1 the SPS gets the new address from the IP configuration tool, then release „F1“).Now the SPS is ready for use under the wanted address.
3. Creating a project: Start the FIAVis Manager. At the first start an additional window appears, that remembers you to enter the license-number and to activate the FIAVis Base data pool. Follow these instructions! In the Manager-main window, where all available projects are listed, an EIBSPS test project is already accessible. To create a new project, click with the right mouse button in the project tree and select in the following menu ‚New project‘.
4. A new project is created, you can choose the project name like you want (you can also change the name at any time, while you do a „slow“ left click). The IP-address of the EIBSPS must be specified in the project-settings (in the right Manager-window double click the settings, in the following window the settings then can be changed).
5. In each EIBSPS project you will need process items, that mean objects to read and write to. There are two different kind of process items in the EIBSPS: EIB process items, and GLOBAL process items. The EIB ones are EIB group addresses/objects, the GLOBAL ones can be used for storing temporary data, for SPS calculations. Each process item will be created with it's own config tool, which will be started from the FIAVis Manager using the menu or double-clicking an existing item in the right list view.
6. For the definition of the EIB-process items you should use an existing ETS-project. All important address-data will be fetched by importing the ETS-project. From all available group addresses/objects from the list above select the data to use in your FIAVis project (list beneath). At some data items you have to reparametrize the EIS-types, the ETS contains no information about the type. Hint: you can also define group addresses manually without an ETS-project (button „Define Addr.“).
7. The memory variables (GLOBAL process items) can be defined by a few user inputs, like the name and the value type (bits, int, real). If you want to view or change the value of a global variable over the FIAVis data pool, you have to set the watch-flag.
8. After you have finished the process item definition (and of course you can change/add the process items at any time later as well), you can create your SPS logic. You should take care when you are deleting/changing existing process items, to change existing SPS logics using this items as well. Otherwise it will not be possible to download the new project inside of the SPS!
9. To create a logic select the logic editor in the FIAVis Manager do a double-click on an existing logic entry in the right manager list. A window appears, in which you can create the logics per Drag&Drop: In the operator list are all available functions and defined process items. Click on a function with the left mouse-button, keep pressed the mouse-button and drag the function or the process item on the logic area. Functions which only have output pins (e.g. constant data sources) and process items, whose value you want to process, are placed at the left side of the logic. If you

want to write a value on a process item, you have to place it on the right side. There are also these functions, which only have input pins (e.g. sub-program start-functions). In the middle are the functions which are needed for the calculations. They have input and output pins. You can connect two function blocks by left clicking an function output pin, and left clicking the to-be-connected input pin.

10. Here now a small example of an useful logic, showing the cycle time of an SPS (this function can be helpful if you want to know how fast your SPS logic is getting executed). First define a GLOBAL process item named „Test“, the value type should be „integer“. Also use the „watch“ flag, so we can read that value later from the SPS. In the Logic editor place the „Test“ process item two times: one time as an input function (left side), and one time as an output function (right side). As a second input function (left side) use a „Constant int“ from the group „data sources“, and in the middle area simply place an „Addition“ function from the groups „Calculations“. Now connect the process item input function and the constant value function with the two „addition“ input pins, and connect the „addition“ output pin to the output process item functions. Now you have a logic which will add the „constant int“ value to the „Test“ process item in each SPS cycle. To get some increasing value you also have to change the value of the „constant int“ by right clicking the function and setting the value property to „1“.
11. You can check that function immediately without downloading it to the SPS: go in the logic editor at the menu item „Test->Start“. A new window will appear, showing all process items used in that logic area. Now you can emulate a SPS cycle by simply pushing the „Run“ button. You will see that our „Test“ item value will increase from 0 to 1. Pushing the button again, the value will go up to 2, etc.  
The test window uses exactly the same executing engine as the real EIBSPS, so you will get the same values as with the real SPS!
12. Your new logic is finished and tested, now you can leave the Logic editor. You will notice that now the FIAVis manager is showing the new logic without a red cross in the right list: the logic is ready for downloading to the real SPS.  
To do so select in the left tree the project to transfer and in the menu „Data transfer “ or click in the tool box on the button „Transfer“.  
In the following window you only have to press the start-button, the transfer begins. Depending on the settings the data is transferred into the EIBSPS and the FIAVis data pool. If the transfer has finished (the SPS is automatically booted). Leave the window with „Close“ and select in the menu or in the tool bar the function „Watch“. All global process items, which have the watch-flag, are listed here, inclusive their actual values. In our test project the „Test“ value should increase at least by 1500 each second.
13. Now you have created your first CCEIB-SPS Project! Of course you can now modify it, and solve your real tasks. The next steps will provide you with some more useful informations and tips.
14. Always check your logics in the offline test mode first. Try to use test values which match the later real usage.  
Check your logics online using the „Watch GLOBAL“ window. Define and use some additional „watch“ global process items, you can connect them in parallel to your real logic, so you can check out doubtful values easily.
15. There are different in/output process item functions. Before you place process items you can select the wanted mode in the operator list. Avoid bad parameterization, which result in high busload.  
Hint: You can change the group addresses of EIB-process items, which are already used in the logic, while putting the new group address per Drag&Drop ON the existing function. So in this case you don't have to remove the old function from the logic and insert the new function.
16. If you want to quickly duplicate a certain part of your logic, simply select the area with the mouse, press and hold the „shift“ key and move the selected area to a new place. That way a copy of the selected functions will be automatically created. If you want the copy can even already be connected to the old outpins, you can enable that behaviour in the properties of the logic (by right clicking a free place in the logic area, option „easy copy mode“).
17. You can also select a group of collection lines, to move them all at once. Press and hold the „ctrl“ key while doing a mouse select. That will only select the connection lines, if you move now one of the lines, all other selected ones will be moved as well.

18. You can create additional logic areas beside the always existing main logic (menuitem „add logic“). That logic areas will be downloaded and executed as well. You can define the additional logics as „always running“ like the main logic, but you can also create logics that will only get started by another logic, or by timer events. You can use GLOBAL process items to transfer data from one logic into another.



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## Additional CCEIBSPS informations

### Networking interface

#### Introduction

The b+b GmbH ComClient device (CCEIBSPS / CCEIBGW) is using the TCP/IP network protocol. This protocol is available on Microsoft Windows 3.11, Windows 9x, Windows NT, Windows 2000 and Windows XP. Most other operating systems also have TCP/IP protocol support.

**You should check if your PC has the TCP/IP protocol properly installed. Please ask your network administrator if you are having troubles setting up your network settings.**

#### TCP/IP

Each PC has an unique IP address in a TCP/IP network area. If your local network is connected to the internet, the IP address has to be unique in the complete internet. IP Addresses will be defined and registered by internet provider or your local government. If you are not connected to the internet, you can select your own address freely. Please ask your network administrator about getting an IP address.

#### Addressing

An IP address has the following syntax: aaa.bbb.ccc.ddd, each variable can be a number from 0 to 255. Example: 192.168.1.2 is a valid address.

The variable aaa has a special function:

1..127 class A network

128..191 class B network

192..254 class C network

Don't use 0 or 255, they are reserved numbers.

The IP address is internally divided into the network address and the host address.

Class A network: aaa is the net address, bbb.ccc.ddd is the host address

Class B network: aaa.bbb is the net address, ccc.ddd is the host address

Class C network: aaa.bbb.ccc is the net address, ddd is the host address

If you want to communicate with a PC which has not the same net address, you will need a router (default gateway) for connecting to a different net. You can check if you can reach another IP address by using the PING command.

Syntax: PING Address, example: PING 192.168.1.2

#### Ports

Each program needs so-called "ports" to use the network. Programs like WWW browser and FTP services can use special defined port numbers, port number 1024...2048 is free to use for different applications. The ComClient software needs port 1111 and port 1121 to work properly.

#### Preconditions

If not already done, install the TCP/IP protocol on the needed computers. Test with the program PING, if a connection between the single computers exists.

Hint for Windows 3.11:

If you use a pure "Windows for Workgroups" (WfW) network, you only have to install the at Microsoft available TCP Stack Microsoft TCP/IP-32 3.11b.

If you use a Novell network, you have to install the Client/32 interface and the Novell TCP/IP.

Hint for Windows 95 and Windows NT:

Respectively over the control panel:

- Click on the icon network,
- Go to the protocol tab,
- Then select add
- Select from the list Microsoft
- and then TCP/IP

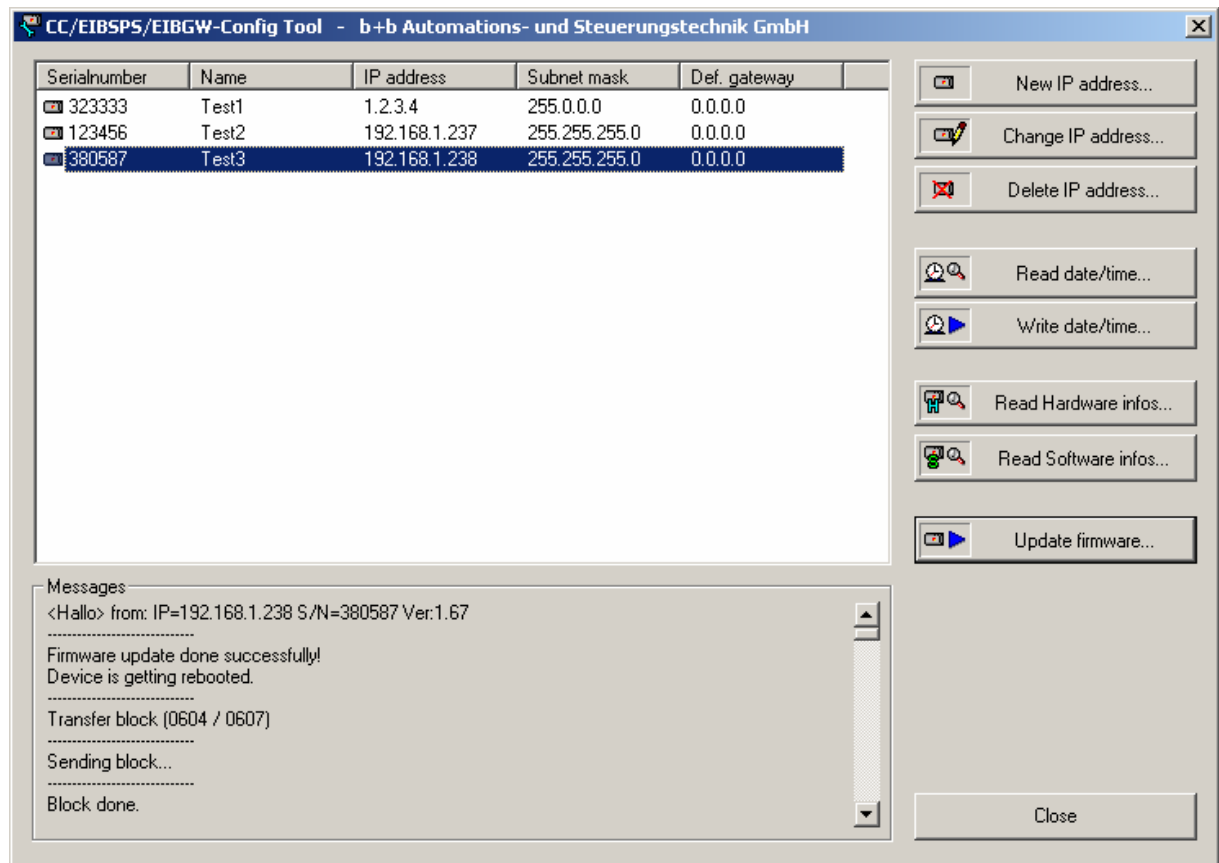
If you have questions regarding parameterization, you should ask your network administrator.

## Firmware Updates

Each ComClient / EIB Controller will be delivered with the newest firmware.

You can update your device when a new firmware with additional functions is released. You don't have to open your device, the "EIBSPS Configuration tool" or the older "Firmware Update Tool" software is downloading the new firmware using a network connection.

Main window:



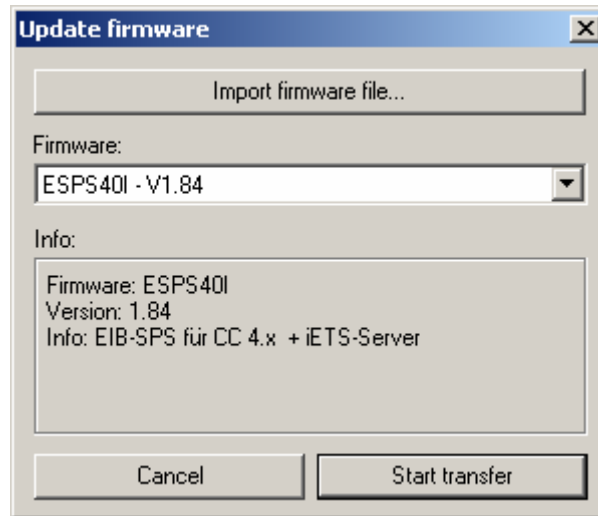
First you should check the network connection: simply select your device from the list, and press the "Read Software infos" button. You will get an answer message like:

```
Serieller Treiber version: 1.0.8.0 loaded.
System Treiber version: 1.0.18.0 loaded.
Speicher Management Treiber version: 1.0.6.0 loaded.
CC-SPS Treiber version: 1.0.24.0 loaded.
Globale Variabeln version: 2.0.6.0 loaded.
EIB-Gateway Treiber version: 1.0.75.0 loaded.
```

After the firmware update the version numbers of at least one driver should be higher than the current versions.

Press the button "Update firmware..." to proceed.

### Update your firmware



To import the newest firmware you have to push the “Import firmware file...” button. A file selection will appear, you have to select the FWUP.INF file from the folder where the current firmware is stored. You will get the firmware directly from the b+b support web site, or from the “support\firmware” folder on the b+b EIBTools CD.

After the import the firmware is selectable from the firmware combo list. Select the firmware matching your device, and push the “Start transfer” button. After a confirmation window, the transfer dialog will close, and the firmware transfer will start.

Hint: if you have selected a firmware which is not matching your device, the transfer will stop with an error. Therefore you cannot damage your device with a wrong firmware. But please don't shutdown the PC or the device while the firmware update is in progress.

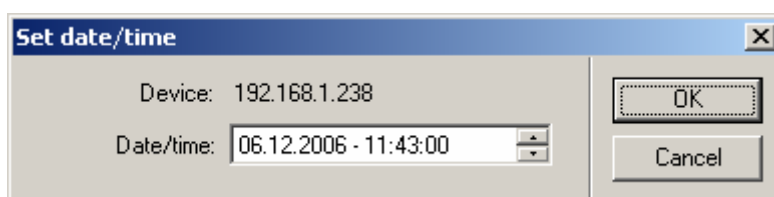
After the firmware update is finished, a message will appear in the main window, and the device will reboot automatically. Now you can read the software version infos again, at least one version number should be higher than before. Please note: after a device reboot, the first “read” will fail most often. Simply press the “Read Software infos” button until you will get the informations successfully.

Also note: a firmware update will not change or delete you device configuration. The IP address will still be the same, and all EIB addresses and logic programs will still be inside the EIBSPS, and they will run as before.

## Additional operations

By using the button “Read Hardware infos”, “Read Software infos” and “Read date/time” you can receive informations about the selected device. The informations will be displayed in the message area.

You can change the date and time of the device's real time clock, by pressing the “Write date/time” button.



By default the current PC system date and time will be used, but you can enter any valid date and time you want to set into the EIBSPS. After pushing "OK" the date/time will be transferred to the device, you can check the clock by pressing the "Read date/time" button afterwards.

## Network ports of the EIBSPS

The EIBSPS uses fix network ports for the communication with other systems (like the FIAVis datapool, or the EIBSPS OPCServer). Up to eight connections are possible at the same time, so for example eight different FIAVis datapools could access the same EIBSPS. There are also network ports for parametrizing the EIBSPS, f.e. to transfer new logics/EIB addresses (with the FIAVis Manager/EIBExplorer) or to change the IP address (with the CCConfig tool)..

Therefore: if you want to communicate with the EIBSPS by network, you have to be sure that the needed network ports are open if you are using a network firewall. Of course, if you want to secure some functionality, you can also decide to keep certain ports locked (for example locking the CONTROL/BOOTP/HELLO - ports would prevent an intruder from changing the EIBSPS addresses and logics).

Please note: every EIBSPS communication needs two different network ports. To lock/unlock a certain communication interface, you always have to lock/unlock both related ports!

Communiacion ports (port usage can be configured in the FIAVis Manager/EIBExplorer software):

COM1:	port 1111 and 22276
COM2:	port 1112 and 22532
COM3:	port 1113 and 22788
COM4:	port 1114 and 23044
COM5:	port 1115 and 23300
COM6:	port 1116 and 23556
COM7:	port 1117 and 23812
COM8:	port 1118 and 24068

Transfer/parameter ports (used by the FIAVis Manager/EIBExplorer/CCConfig software):

COMC_CTRLPORT:	port 1120 and 24580
COMC_BOOTP:	port 1121 and 24836
COMC_HELLO	port 1122 and 25092

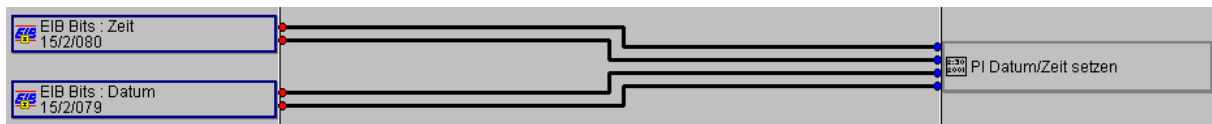
## EIBSPS RTC time synchronization

The EIBSPS device contains an internal RTC (Real Time Clock), which gives the current time and date for logic functions (for example a logic which is controlling the lights depending on the day time).

To set the RTC, you can use the „EIBSPS configuration tool“ (as described above). Nevertheless the RTC will (like a RTC from a PC) go wrong for a few seconds each month. Also the EIBSPS RTC will offer no daylight saving functions (since that would depend on the location of the EIBSPS).

To correct the RTC automatically, there are two ways: a) by using the date/time of a DCF device from the EIB and b) to get the time/date from a PC by the network connection.

To do an automatic synchronization by the EIB, you have to configure the two DCF group addresses in your EIBSPS project (the addresses need to be EIS type 0x30 and 0x40). Then you have to use the two addresses in a small logic in your EIBSPS project:



This logic will take the time / date value from the EIB, and set the RTC to this values.

To do a PC network time synchronisation, you have to install a small Windows service on your PC. This service can be found on your EIBTools-Setup.CD, in the folder „Support\b+b CC Time Server“.

### Installation:

Copy the three files from this folder to a local folder on your local harddisk. Now change the INI file by using a text editor (e.g. Windows Notepad). The INI file has some entries to configure the IP addresses of the EIBSPS devices (up to 255 EIBSPS can be updated at once), and the update times. All of the INI parameters are described in the INI-file itself.

Now the exe file has to be started once with the parameter „/open“ (e.g. „bbcctimesrv /open“). This call will install and start the Time service, from now on the service will also be loaded and activated each time on Windows startup.

To uninstall the service, you have to start the exe with a parameter „/close“ („bbcctimesrv /close“). This will stop and uninstall the service, it will also not be activated anymore on Windows startup.

Please note: if you want to make changes in the INI file, you have to stop the service, and restart it after you have made the changes. You can also simply reboot the PC to take the new INI settings..

As long as the service is installed and running, it will synchronize the PC time/date with the configured EIBSPS devices by network.

## Usage of the programming button

The programming button of the flange mounting CCEIBSPS/CCEIBGW devices is located beneath the two status leds. The programming button of the rail mounting version is labeled „F1“.

