

# LAN router for the EIB

## CCEIBRouter

November 2006



Order number: E001-K014001

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# 1 Highlights

- 2000 static routes per unit
- up to 32 destination routers adressable
- Programming and watching the routes with Windows software
- Connects direct to the EIB (two wire line)
- EIB-Backbone-speedup (100MBit/s instead of 9600Bit/s)
- DIN-rail-mounting (9TE)
- LAN side uses TCP/IP protocol
- Address translation of group addresses from source network to destination network
- Firmwareupdates via network
- No server required
- Integrated 230V-power supply

# 2 Fields of application

- connecting several building parts with existing EIB networks by LAN/WAN
- classifying of an existng unit in smaller Instabus networks
- remote by ISDN Router

# 3 Contents of delivery

- CCEIBRouter with EIB interface and firmware
- Software for programming the router
- Documentation

## 4 Introduction

The network interface of the b+b EIB Router for the EIB is based on network protocol TCP/IP. This is a usual network protocol available on most common operating systems such as Microsoft Windows 3.11, Microsoft Windows 95/98/ME and Microsoft Windows NT/2000/XP.

Before you start using the Router Administrator, you should check if TCP/IP is installed on your computer. If you have problems or questions, do not hesitate and ask your local network administrator.

## 5 TCP/IP

In a TCP/IP network each computer is identified by a unique IP address. This address must be world unique, if the network has entrance to the world-wide InterNet. Such addresses are assigned and registered by an authority and/or by various Providers. If your network is not connected to the public internet you are nearly free to assign any address. If you have problems or questions in finding the correct IP address, do not hesitate and ask your local network administrator.

### 5.1 Adressierung

An IP address has the form aaa.bbb.ccc.ddd, whereby aaa to ddd can go through 0...255. Your address could be for example 192.168.1.1.

The first (leftmost) number aaa has a special meaning:

- 1...127 Class A network
- 128...191 Class B network
- 192...254 Class C network

All other numbers have special meanings.

Each IP address consists of two different parts, they are the network address and the host address.

In a class A network the IP address for the host 117.1.2.3 is divided into the network 117 and the host address 1.2.3.

127 class A networks can exist which can access up to 16.7 Mio. Computers. This configuration is typically used only by large network organizations.

In a class B network the IP address for the host 130.67.62.1 the network address will be 130.67 and the host address will be 62.1. With a class B network you can make up 65535 subnets with up to 65535 computers in each subnet. This configuration is typically used by big companies with a lot of computers.

In a class C network the IP address for the host 192.168.1.1 the network address will be 192.168.1 and the host address will be 1. With a class C network you can make up 16.7 Mio. subnets with up to 253 computers in each subnet. This configuration is typically used by providers, small companies and home users..

If you have problems or questions in finding the correct value for the network mask, do not hesitate and ask your local network administrator.

Computers or devices, with which you want to communicate with, must have either the same network address, or you need a network router (default gateway) as link between the individual networks.

By using the commandline utility PING you can examine whether you can communicate from your local computer to another computer or network device.

Syntax: PING Address, e. g.: PING 192.168.1.1

## **5.2 Ports**

Since on your computer may run more the one application that uses TCP/IP, each incomming or outgoing packet is assigned to a port. Any application that want to use TCP/IP must register an individual port within TCP/IP, so that incomming packets can be sent to the waiting application. Some applications use well-known-ports e.g. Web uses portnumber 80. The EIB Router uses port 1111 upto port 1121.

## **6 Conditions to use the Router Administrator**

If not done before, install the TCP/IP network protocol on your local computer. Use the PING application to verify your connection to the network.

### **6.1.1 Notes when using Windows 3.11:**

If you are using a pure "Windows for Workgroups" (WfW) networkyou only need to install the TCP/IP Stack which can be downloaded from Microsoft (TCP/IP-32 3.11b).

If you are using a Novell network verwenden, you need to install the Client/32 interface with the Novell TCP/IP extension.

If you have problems or questions, do not hesitate and ask your local network administrator.

### **6.1.2 Notes when using Windows 95/98/ME and Windows NT**

- Open the controlpanel
- Click on the network icon
- Select the protocol tab
- Then press the button "Add"
- Choose drivers from Microsoft
- select TCP/IP

If you have problems or questions, do not hesitate and ask your local network administrator.

### **6.1.3 Notes when using Windows/2000 und Windows/XP**

- Click on Start – Settings – Network Connections
- Choose Local Network – Rightclick Properties
- Then press the button "Install"– Protocol – TCP/IP

If you have problems or questions, do not hesitate and ask your local network administrator.

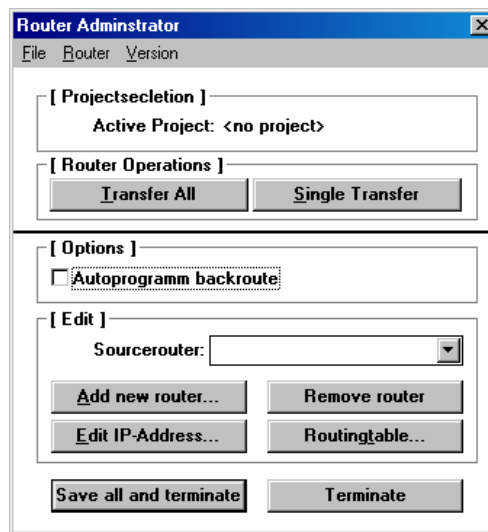
## 7 Installation of the Router Administrator Application

Create a folder on your computer. Copy all files including any subfolders from the CD to the newly created folder. Remove the read-only protection from all files and create a shortcut to the RTPROG.EXE application.

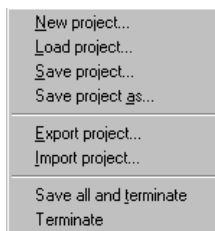
### 7.1 Configuration of the Router

#### 7.1.1 Items in the Menu

If you start the application you will see the following screen:



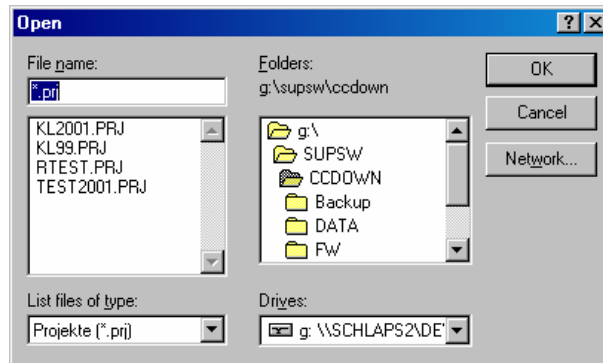
##### 7.1.1.1 Items in the Submenu file



With the menu option "New project" can be produced a new (empty) project. In a project all project engineering data are stored. This covers the IP - addresses of the particular routers and their routingtables. In order to be able to configure your routers it is necessary it that a project is opened.

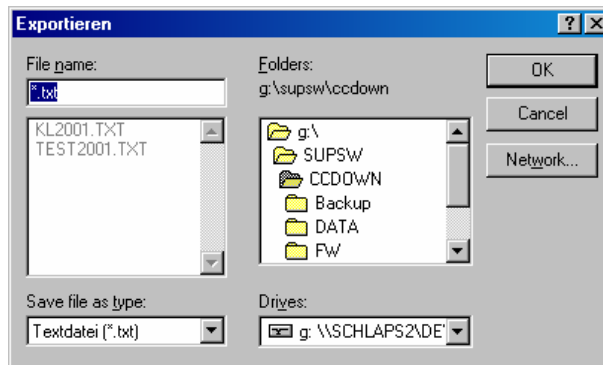


With the menu option "Load project" an can existing can project be loaded. Select in the following dialogue the project you wish to load and confirm it with the "OK" button.



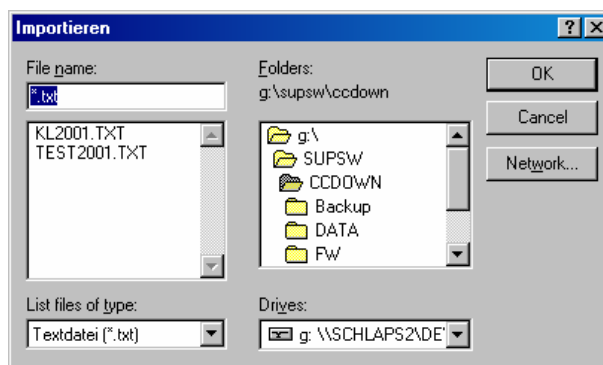
The project will be loaded from the selected location.

With the menu option "Export project" can export the active project into a text file.



Select an existing file, or specify a new file name. After pressing the "OK" button the current project will be exported.

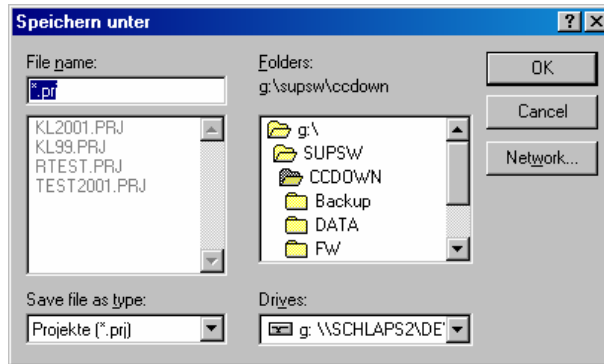
With the menu option "Import project" you can import a project from a text file. Select in the following dialogue the file that you wish to import and confirm it with the "OK" button.



Select an existing file. After the "OK" button was pressed the file is imported into the current project.

With the menu option "Save project" you can save the current active project. If the project was created with the "new project" option the application will proceed as described in the "Save As" option..

With the menu option "Save project as" you can save the active project under a new name. In the subsequent window the name of an existing project can be selected, or a new name can be entered.



Confirm with the "OK " button. The project will be saved.

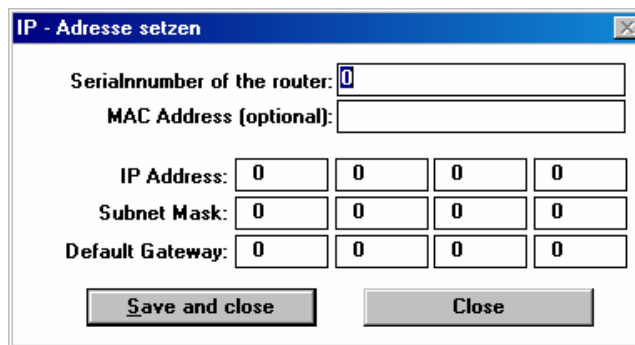
With the menu option "Terminate and Save" you can save the project and the terminate the Router Administrator application.

With the menu option "Terminate" you terminate the Router Administrator application without saving your changes.

### 7.1.1.2 Items in the menu Router

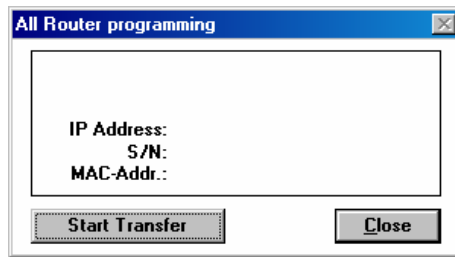


With menu option "New" you can add a new router to the project. Each project can consists of upto 32 routers with each of 1024 routes. When selecting the following Window will appear:



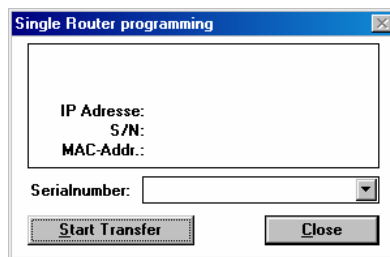
In the first line you enter the serial number of the EIB router which can be found on the top of the device. In the next line you can optionally enter the MAC-address of the EIB router. In the next line you enter the IP address of the EIB router. If your subnetmask is different from the displayed one, you may adjust it in the next line. At least you can enter the IP address of your default gateway. With the "save and exit" button. are the changes saved.

With the menu option "programm all" you can download all configurations in your project in one single step.



With the button "Start transfer" you send the configurations. With the "close" button you leave this window.

With the menu option "program single" you can download a single configuration to a single router



By selecting a serialnumber and pressing the "Start Transfer" button the configuration of the selected router will be sent. With the "close" button you leave this window.

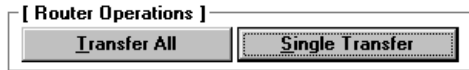
### 7.1.1.3 Items in the Menu Version



With this menu option you will see the version of the router administration application.

## 7.1.2 Items in the main window

### 7.1.2.1 Button "Programming"



By pressing the button " Program All" you can download the configuration to all routers in a single step. Using the "Program Single" button you are able to download the configuration to a single device.

### 7.1.2.2 Button "Adjust all routers"



With this option some route generation will be automated. If you create a route on one router, the backout on the other router will automatically generated.

### 7.1.2.3 Selection "Current router"

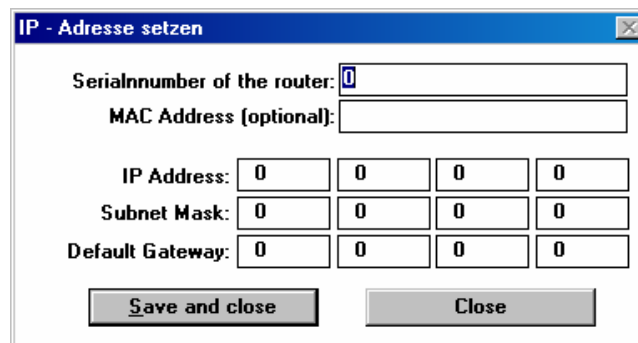


With this selection you define on wich router you are currently operating.

### 7.1.2.4 Button "New router"



With this button you are able to create a new routing device.

A screenshot of a dialog box titled "IP - Adresse setzen". It contains several input fields: "Serialnumber of the router:" with a text box containing "0"; "MAC Address (optional):" with an empty text box; "IP Address:" with four text boxes each containing "0"; "Subnet Mask:" with four text boxes each containing "0"; and "Default Gateway:" with four text boxes each containing "0". At the bottom are two buttons: "Save and close" and "Close".

In the first line you enter the serial number of the EIB router which can be found on the top of the device. In the next line you can optionally enter the MAC-address of the EIB router. In the next line you enter the IP address of the EIB router. If your subnetmask is different from the displayed one, you may adjust it in the next line. At least you can enter the IP address of your default gateway. With the "save and exit" button are the changes saved.

### 7.1.2.5 Button "Remove router"



By pressing this button you will remove the current selected router from your project.

### 7.1.2.6 Button "edit IP address"



By pressing this button the IP configuration of the current selected router is opened:

**IP - Adresse setzen**

Serialnummer of the router:

MAC Address (optional):

IP Address:

Subnet Mask:

Default Gateway:

In the first line you enter the serial number of the EIB router which can be found on the top of the device. In the next line you can optionally enter the MAC-address of the EIB router. In the next line you enter the IP address of the EIB router. If your subnetmask is different from the displayed one, you may adjust it in the next line. At least you can enter the IP address of your default gateway. With the "save and exit" button are the changes saved.

### 7.1.2.7 Button "Routing Table"



By pressing this button you are able to edit the routing table of the current selected EIB router. A closer description will follow in the next chapter.

**Routing Tabelle [53.124.186.6]**

[ Available Routers ]

[01] <input checked="" type="checkbox"/> 53.124.186.7	[09] <input type="checkbox"/> nicht vorhanden	[17] <input type="checkbox"/> nicht vorhanden	[25] <input type="checkbox"/> nicht vorhanden
[02] <input type="checkbox"/> 53.124.186.6	[10] <input type="checkbox"/> nicht vorhanden	[18] <input type="checkbox"/> nicht vorhanden	[26] <input type="checkbox"/> nicht vorhanden
[03] <input type="checkbox"/> nicht vorhanden	[11] <input type="checkbox"/> nicht vorhanden	[19] <input type="checkbox"/> nicht vorhanden	[27] <input type="checkbox"/> nicht vorhanden
[04] <input type="checkbox"/> nicht vorhanden	[12] <input type="checkbox"/> nicht vorhanden	[20] <input type="checkbox"/> nicht vorhanden	[28] <input type="checkbox"/> nicht vorhanden
[05] <input type="checkbox"/> nicht vorhanden	[13] <input type="checkbox"/> nicht vorhanden	[21] <input type="checkbox"/> nicht vorhanden	[29] <input type="checkbox"/> nicht vorhanden
[06] <input type="checkbox"/> nicht vorhanden	[14] <input type="checkbox"/> nicht vorhanden	[22] <input type="checkbox"/> nicht vorhanden	[30] <input type="checkbox"/> nicht vorhanden
[07] <input type="checkbox"/> nicht vorhanden	[15] <input type="checkbox"/> nicht vorhanden	[23] <input type="checkbox"/> nicht vorhanden	[31] <input type="checkbox"/> nicht vorhanden
[08] <input type="checkbox"/> nicht vorhanden	[16] <input type="checkbox"/> nicht vorhanden	[24] <input type="checkbox"/> nicht vorhanden	[32] <input type="checkbox"/> nicht vorhanden

Source Groupaddress:  Dest. Groupaddress:

Sourceaddr.	Dest.addr.	1	< - Used routers - >	32
0/0/1	0/0/1	J	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
0/0/2	0/0/2	J	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
0/0/3	0/0/3	J	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
0/0/4	0/0/4	J	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
0/1/0	0/1/0	J	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
0/1/1	0/1/1	J	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	

### 7.1.2.8 Button "Terminate and save" and Button "Terminate"

 Save all and terminate

By pressing this button, the current project will be saved to disk. If you have newly created the project, you are asked for a filename. After saving the application will close.

 Terminate

By pressing this button the application will close without saving any data.

## 8 Description of the subwindows

### 8.1 Transmission of the IP address to EIB router

That router administrator must started and a project be loaded.

**Step 1:** Separate supply voltage from the EIB router and press the programming button. The programming button is on the connection side of the EIB router above the red and green LED's.

**Step 2:** Connect the EIB router with pressed programming button with supply voltage. After short time the red LED begins to flash. Leave the programming button pressed until the red LED stop flashing and the green LED begins to flash.

**Step 3:** Release the programming button.. If programming was successfully the EIB router will respond to a ping command.

Possible errors:

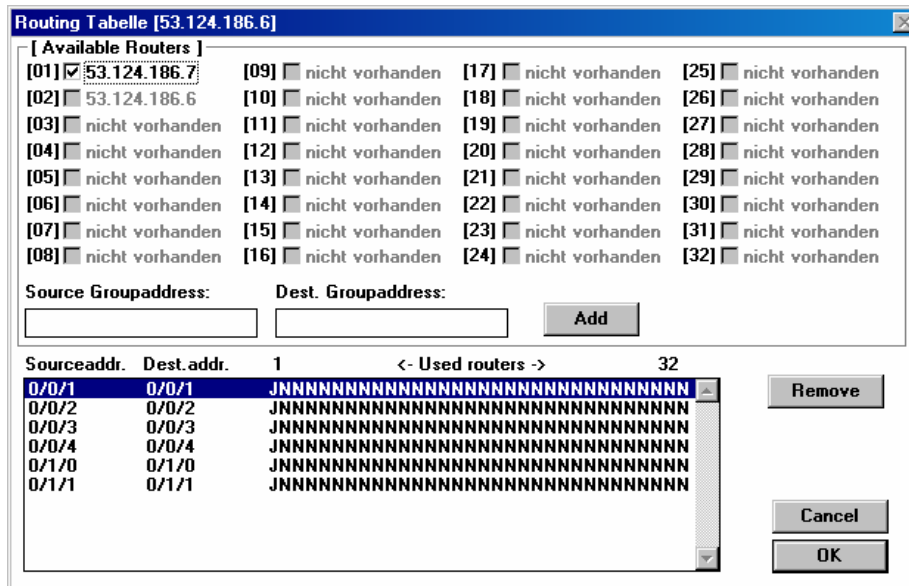
The green LED does not flash, after short time both LED's are permanent on.

Remedy:

The EIB router is in a different subnet or is not connected with the network. Examine the network connection. Examine the TCP/IP address.

### 8.2 Configuration of the Routingtable

In this window you can loop-up or edit the routing table of the current selected EIB router.



In this window you will see listed all 32 routers with their assigned IP address. The current active printed is displayed in a dimmed color. If you check one or more routers in this display the source and destination group address is routed from the current router to the selected devices.

In the list on the bottom of the window, you will see a summary of all routes. When pressing the "Remove" button you can remove a route.

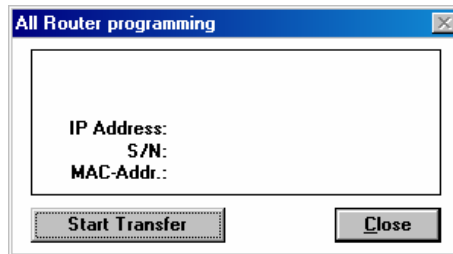
If you want to create a new route, you need to enter a source group address and a destination group address. In most cases both addresses are same. Then you will select the routers, where to route this group addresses and press the "Add" button.

If you want to edit an existing route, you select one route in the bottom list. After doubleclicking this entry, all data are transferred to the edit area.

By pressing the "OK" button all changes will be saved.

### **8.3 Transferring the configuration**

After that all data were registered and stored and the EIB router has a valid IP address assigned, the configuration can be sent to the EIB router. This is done via the menu option or the button "programm all".



By pressing of the "Start transfer" button the data communication starts. The data will be sent using your local network. For this reason all EIB routers must have a valid IP address, which corresponds to the configured, and need to be connected to the network and supply voltage. If errors arise, you should examine the EIB routers and afterwards repeat the programming process.



## Appendix A Specification of the export text file

Each file has the same structure like this:

Fieldname	Keyword	Content
ID		b+b GmbH, Routerprojekt
Version	.VERSION	1.0
Projectname	.PROJEKTNAME	Projectname (max 31 characters)
Routerlist	.ROUTERLISTE	
Routerentries	.RT	e. g.: 2 = 709201,193.2.1.51,255.255.255.0,0.0.0.0
Routinglist	.ROUTINGLISTE	
Routingentries	.GA	e. g.: 2 = 1/0/0,1/0/0,3,4
End of file	.END	

Meaning of the fields:

At the beginning of an import file the identification must stand. It serves for the identification as valid import file. As next entry the version follows, in order to be able to consider future extensions. After the version the entry for the project name follows. The next section is introduced by the keyword ROUTERLISTE. Afterwards routing entries follow up to 32. Each routing entry is build up as follows.

### **Routerno = Serialnumber,IP-Address,Networkmask,[Default Gateway]**

**Routerno** a number between 1 and 32. No duplicate numbers are allowed.  
**Serialnumber** serial number of the router  
**IP-Address** IP-adress of the router  
**Networkmask** network maske of the router  
**Default Gateway** optional, Default Gateway of the router

The Routingliste is lead in by the keyword ROUTINGLISTE. Afterwards follows the routingentries, which are assembled as follows:

### **Routerno = Sourcegroupaddress,Destinationgroupaddress, Destinationrouterno1, Destinationrouterno2,...**

**Routerno** a number between 1 and 32. Only numbers from ther routerlist are allowed.  
**Sourcegroupaddress** groupaddress to route to  
**Destinationgroupaddress** groupaddress used at the destination  
**Destinationrouterno 1 ... n** list of routers that receive the routed data

## **Appendix B** Specification of the export text file (Sample)

b+b GmbH, Routerprojekt

.VERSION = 1.0

.PROJEKTNAME = TEST

.ROUTERLISTE

.RT 2 = 709201,192.168.1.51,255.255.255.0,0.0.0.0

.RT 3 = 709202,192.168.1.52,255.255.255.0,0.0.0.0

.RT 4 = 709203,192.168.1.53,255.255.255.0,0.0.0.0

.ROUTINGLISTE

.GA 2 = 1/0/0,1/0/0,3,4

.GA 2 = 1/0/1,1/0/1,3,4

.GA 2 = 1/0/2,1/0/2,3,4

.GA 2 = 1/0/3,1/0/3,3,4

.GA 2 = 7/1/1,7/1/1,3,4

.GA 3 = 2/0/0,2/0/0,2

.GA 3 = 2/0/0,2/0/0,2

.GA 3 = 2/0/1,2/0/1,2

.GA 3 = 2/0/2,2/0/2,2

.GA 3 = 2/0/3,2/0/3,2

.GA 3 = 8/2/3,8/2/3,2

.END