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Highlights CT-KNX/IP Gateway

- Simple access to the EIB
- Standard-ASCII-Code
- Supports all 32767 group addresses simultaneously
- Supports all EIS-types
- Simple setup using a terminal program
- built in German and English help texts
- Fully transparent even at 100% bus load
- Built in filter- and EIS-type tables
- All values read and writeable using plain text
- Simple integration of the EIB into own systems (PC,uC...)
- Built in bus coupling unit
- Integrated mains adapter (110-230V)
- Standard-RS232-Interface, no system drivers required
- DIN-rail mounted 9TE = 156mm for top hat rail mounting

Although the CT-KNX/IP Gateway contains a large instruction set, for communication 3 commands will suffice:

Read requests of group addresses

Send values to group addresses

Listening to group address telegrams

Contents of delivery

- CT-KNX/IP Gateway
- Parametrization software AVITTerminal
- Documentation

View:

Width: 9TE (156mm)

Connectors: EIB, 230V, RS232 over clamps or SUB-D

Mounting: top hat rail

Introduction

The CT-KNX/IP Gateway is a serial interface to the EIB with integrated EIB-2-wire-buscoupler. The CT-KNX/IP GATEWAY allows an operating system independent connection of the EIB to your own system.. The communication is done in human readable text without time critical handshake signals.

Hint: The setup is easily done with the provided AVIT Terminal-program.
It contains a configuration window in which all settings can be adjusted and then transferred to the EIB-MEDIEN-TECHNIK-GATEWAY.

The program is located in the installation folder of the CT-KNX/IP Gateway and can be started with a double click on the file AVITTerminal.exe.

Functional Description (Rev 4.01)

EIB-Interface:

2-Wire twisted pair with integrated bus coupling unit
supported group addresses: 32765

Network interface:

Configure IP using IP-Config tool from CD.

ASCII-Protocol description:

The communication between host and CT-KNX/IP Gateway uses readable text only. The EIB-Mediatechnik-Gateway neither sends nor accepts characters below 20Hex (ASCII Blank). The only exception to this rule is the carriage return char(0d Hexadecimal), shortened called “cr” in the following text.. The c r is used to signal the end of a transmission. Characters sent from the host are not echoed by the device.

All command related characters are treated as uppercase, the means the device is “case insensitive”.

ASCII-Commands:

ASCII-Command: request help text

Command: "?"

Purpose: Request of the help text

Description: The device sends a short version of this document to the host

Remark: During this command the EIB Communication is stopped!

Reply from the Device: Helptext

ASCII-Command: Version request

Command: "?V"

Purpose: Query the firmware version

Description: The CT-KNX/IP GATEWAY sends its firmware revision and serialnumber.

Reply from the device: "EIB_Terminal Vn.nn SN:xxxxxxx"
n.nn = Firmwareversion, xxxxx xxx = Serialnumber

Example reply: EIB_Terminal V4.05 SN:3709651

ASCII-Command: Physical address request

Command: "?P"

Purpose: Query the physical address of the CT-KNX/IP GATEWAY

Description: The CT-KNX/IP GATEWAY sends its physical address

Reply from the device: "Phys. Addr=nn.nn.nnn" or
"Phys. Addr=xxxx" if the hexadecimal option is activated.

Example reply: Phys. Addr=01.01.254

ASCII-Command: Setup the physical address

Command: "P:PA"

Purpose: Setup the physical address of the CT-KNX/IP GATEWAY and store it non-volatile

Description: PA may be given as AA.LL.DDD or Hexadecimal as "xALDD"

Telegram contents: "P:AA.LL.DDD" or "P:xALDD", where: A=Area, L=Line, D=device

Reply from the device: "Phys. Addr=nn.nn.nnn" or "Phys. Addr=xxxx" if the hexadecimal option is activated.

Remark: Device must be nonzero, address 15.15.255 is invalid

Error messages: "!Bad Command Format" if the command is badly formatted.
"!Bad value" if an illegal address given.

Example: P:1.1.250 sets the physical address of the CT-KNX/IP GATEWAY to 1.1.250

Hint: The setup is easily done with the provided AVIT Terminal-program. It contains a configuration window in which all settings can be adjusted and then transferred to the EIB-MEDIEN-TECHNIK-GATEWAY.

ASCII-Command: Get the current options

Command: "?O"

Purpose: Request the status of the various options

Reply: "OPTIONS: Dw Ew Gw Hw Nw Qw Rw Sw Vw Ww Xw"

Remark: w="+" option activated, w="-" option deactivated

During this command the EIB Communication is stopped!

Possible Options:

"OVw" Verbose mode

If Verbose mode is activated the device replies to commands with an answer, either „OK“ or an error description.

"OEw" Echo of own write telegrams

If this option is activated own write telegrams are sent back to the host after received „back“ from the bus. Since this filtering is done by comparing physical source address please pay attention to assign physical addresses only once. The echo telegram will be processed by the normal receive filter(described later).

"OQw" Report read telegrams to the host

If this option is activated received read telegrams of enabled group addresses are sent to the host. The format is similar to an value telegram, instead of „=value“ read telegrams are signaled with „*“.

"OXw" Hexadecimal mode

If this option is activated the addresses are transmitted as „XXXX“, that means as 4 hexadecimal digits.

The components are divided as follows:

Source address(physical address): "ALDD"

4 Bit Area address, 4 Bit Line address, 8 Bit Device address

Target address(group address):"0HHHHMMM UUUUUUUU"

To explain this we need to use the binary description:

The most significant Bit is always zero, followed by 4 bits for the maingroup, 3 bits for the middlegroup and 8 bits for the subgroup.

If this option is deactivated the source addresses are formatted as

AA.LL.DDD and target addresses as HH/M/SSS

A=Area,L=Line,D=Device,H=Maingroup,M=Midgroup,S=Subgroup.

"ORw" Allow read telegrams to disabled group addresses

If activated the device allows to send read telegrams to disabled group addresses, else the read request is dropped.

"OSw" Send source address to the host

If enabled the source address of each telegram is inserted in front of the destination address. This causes more data transfer and requires 38400Baud!

"OHw" RTS/CTS Handshake

If activated the device sends data to the host only if the RTS line is activated. The CTS line signals that data may be transmitted by the host.

"ONw" Telegram numbering

If activated the telegrams to the host are prefixed with an 3 digit decimal or 2 digit hexadecimal number. This number is incremented by 1 after each transfer and set to zero again when reached 255/0xff .

"OGw" Language selection

OG+ selects German, OG- English

"ODw" Decimal sign selection

OD+ selects the Dot as decimal delimiter,
OD- selects comma.

"OWw" Wait message

If activated the device sends an "please wait" message to the host on lengthy operations, like setting up attribute ranges of the ERASE! Command.

ASCII-Command: Converting of group addresses

Command: "Cga"

Purpose: Useful utility function to convert group address formats

Remark: Causes no read or write action to the bus

Example1: An hexadecimal group address is given, the decimal format is wanted:

Host sends: CX5F03

The device answers with X5F03=11/7/003

Example2: The other way round:

Host sends: C11/7/3

The device answers with 11/7/003=X5F03

ASCII-Command: Get group address attributes

Command: "Gga"

Purpose: Get the remanent attributes of group address „ga“.

Remarks: Causes no read or write action to the bus

"ga" may be specified as "HH/M/SSS" or "xNNNN".

While processing this command the EIB communication is stopped!

Reply: "Gga:n,f"

n = dataformat used for this ga, 0..21 (see data formats!)

f=receive enable, "E"/"D" E=Enabled, D=Disabled

Example: G0/0/1 requests the attributes for group address 0/0/1.

Example Reply: 00/0/001:1,E that is: Format 1, receive enabled

ASCII-Command: Get group address range attributes

Command: "Gga1-ga2"

Purpose: Get the remanent attributes of group address „ga1“ upto „ga2“.

Remarks: Causes no read or write action to the bus

"ga" may be specified as "HH/M/SSS" or "xNNNN".

While processing this command the EIB communication is stopped!

Reply: "Gga:n,f"

n = dataformat used for this ga, 0..21 (see data formats!)

f=receive enable, "E"/"D" E=Enabled, D=Disabled

The whole specified range is sent to the host, one line for each ga.

Possible error messages:If option "V-" is set: none

IF "V+" is set:

"!Bad Command Format"

"!Bad Group Address"

Example: G0/0/1-0/0/4 requests the attributes of the group addresses 0/0/1 to 0/0/4.

Example reply: 00/0/001:1,E that is format 1, receive enabled

00/0/002:1,E that is format 1, receive enabled

00/0/003:1,E that is format 1, receive enabled

00/0/004:1,E that is format 1, receive enabled

ASCII-Command: Setup group address attributes

Commands: "Sga:n"

"Sga,f"

"Sga:n,f"

Purpose: Setup attributes for group address „ga“ and store settings nonvolatile.

Remarks: "ga" may be specified as "HH/M/SSS" or "xNNNN".

n = dataformat used for this ga, 0..21 (see data formats!)

f=receive enable, "E"/"D" E=Enabled, D=Disabled

While processing this command the EIB communication is stopped!

Reply: If option "V-" is set: none

If "V+" is set: "Ok".

Possible error messages:If option "V-" is set: none

IF "V+" is set:

"!Bad Command Format"

"!Bad Group Address"

Example: S1/0/1:1,E defines the group address 1/0/1 as 1-6 Bit value and enables the receive This attributes are used i.e. for ON/OFF telegrams.

ASCII-Command: Setup group address range attributes

Commands: "Sga1-ga2:n"

"Sga1-ga2,f"

"Sga1-ga2:n,f"

Purpose: Setup attributes for group address „ga1“ upto “ga2” and store settings non-volatile.

Remarks: "ga" may be specified as "HH/M/SSS" or "xNNNN".

n = dataformat used for this ga, 0..21 (see data formats!)

f=receive enable, "E"/"D" E=Enabled, D=Disabled

While processing this command the EIB communication is stopped!

Reply: If option "V-" is set: none

If "V+" is set: "Busy...", after processing "Ok".

Possible error messages:If option "V-" is set: none

IF "V+" is set:

"!Bad Command Format"

"!Bad Group Address"

Example: S1/0/1-1/0/255:1,E defines the group addresses 1/0/1 to 1/0/255 as 1-6 Bit value and enables the receive. This attributes are used i.e. for ON/OFF telegrams.

additional hint: The device needs about 10 seconds for setting up the whole address range.

ASCII-Command: Read request to a group address

Command: "Rga"

Purpose: Send a value read telegram to the bus for the specified address "ga".

Remarks: "ga" may be specified as "HH/M/SSS" or "xNNNN".

The read telegram is only sent to the bus if the group address is activated or the global option "R+" has been set.

Reply: If option "V-" is set: none

If option "V-" is set: "OK" on success

Possible error messages: If option "V-" is set: none

IF "V+" is set:

"!Bad Command Format"

"!Bad Group Address"

"!Group Address Disabled"

"!EIB not connected"

Example: R0/0/1 creates a value read telegram for GA 0/0/1.

ASCII-Command: Send value to a group address

Command: "Wga=v"

Purpose: Send a value write telegram to the bus for the specified address "ga" with value "v"

Remarks: "ga" may be specified as "HH/M/SSS" or "xNNNN".

"v"=Data value, dependant on the selected data format
(see section data formats)

Reply: If option "V-" is set: none

If option "V-" is set: "OK" on success

Possible error messages: If option "V-" is set: none

IF "V+" is set:

"!Bad Command Format"

"!Bad Group Address"

"!Group Address Disabled"

"!EIB not connected"

"!Bad value"

Examples: W1/0/1=1 sends a „ON“ telegram on the group address 1/0/1 if this one is setup with data format 1.

W1/0/1=0 sends a „OFF“ telegram on the group address 1/0/1 if this one is setup with data format 1.

Data formats:

The supported data formats are supporting all currently defined non structured "DPT" types of the EIB Specification. Those have been extended to support special host requirements.

Data formats: Format1

Data type: Binary data, 1-6 Bit raw data length

Value range: 0..63 Decimal, x0..x3F Hexadecimal

Remarks: Supports the DPT 1.x, 2.x and 3.x

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the data format is decimal.

Data formats: Format2

Data type: 1 ASCII-char

Value range: 20H..0FFH

Remarks: DPT 4.001 8 Bit , " character ASCII"

On sending the char following the „=" is sent to the bus.

On receiving exactly one char is transmitted.

Data formats: Format3

Data type: Percentage 0-100%

Value range: 0..100 Decimal, x0..x64 Hexadecimal

Remarks: DPT 5.001 8 Bit , " percentage"

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the data format is decimal with 2 fractional digits.

Data formats: Format4

Data type: Angle 0-360 Degrees

Value range: 0..360 Decimal, x0..x168 Hexadecimal

Remarks: DPT 5.003 8 Bit , " angle degrees "

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the data format is decimal with 2 fractional digits.

Data formats: Format5

Data type: 1 Byte unsigned

Value range: 0..255 Decimal, x0..xff Hexadecimal

Remarks: DPT 5.010 8 Bit , " 1 Byte unsigned value"

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the data format is decimal.

Data formats: Format6

Data type: 1 Byte signed

Value range: -128..127 Decimal, x0..xff Hexadecimal

Remarks: DPT 6.x 8 Bit , " 1 Byte signed value "

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the data format is decimal, negative values are prefixed with "-".

Data formats: Format7

Data type: 2 Byte unsigned

Value range: 0..65535 Decimal, x0..ffff Hexadecimal

Remarks: DPT 7.x 2 Byte, " 2 Byte unsigned value"

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the data format is decimal.

Data formats: Format8

Data type: 2 Byte signed

Value range: -32768..32767 Decimal, x0..ffff Hexadecimal

Remarks: DPT 8.x 2 Byte, " 2 Byte signed value "

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the data format is decimal, negative values are prefixed with "-".

Data formats: Format9

Data type: 2 Byte EIB floating point

Value range: -671088.64 to 670760.96, exponents 0..15.

Resolution: 0.01.

Data format: "SEEEEEMMMMMMMMMM"

S= sign of mantissa

E= Exponent

M= Mantissa

Remarks: DPT 9.x 2 Byte," 2 Byte float value "

The EIB floating point format consists of the sign bit of the mantissa,

4 bits exponent and 11 bits for the mantissa itself.

Per definition the mantissa has to be multiplied with 0.01.

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

If given as hexadecimal the value must contain the floating point value already!

On receiving the data format is decimal with 2 fractional digits, negative values are prefixed with "-".

Data formats: Format10

Data type: 3 Byte Time

Data format: "hh:mm:ss", hh= hour 0..23, mm= minute 0..59, ss= second 0..59

Remarks: DPT 10.x 3 Byte," Time"

On sending either the format "hh:mm:ss" or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

If given as hexadecimal the value must contain the hh value in the 1st byte, the mm value in the 2nd byte and the ss value in the third byte.

"xhhmmss", hh= 00..17h, mm= 00..3Bh, ss= 00..3Bh

On receiving the data is formatted as "hh:mm:ss".

Data formats: Format11

Data type: 3 Byte Date

Data format: "dd.mm.yy", dd= day 1..31, mm= month 1..12, yy= year 00..99

Remarks: DPT 11.x 3 Byte, "Date"

On sending either the format "dd.mm.yy" or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

If given as hexadecimal the value must contain the dd value in the 1st byte, the mm value in the 2nd byte and the yy value in the third byte.

"xddmmyy", dd= 01..1fh, mm= 01..0Ch, yy= 00..63h

On receiving the data is formatted as "dd:mm:yy".

The data is not completely validated, that means the date 31.02.02 will be accepted by the device.

Data formats: Format12

Data type: 4 Byte unsigned

Value range: 0...4294967295 Decimal, x0..xffffffff Hexadecimal

Remarks: DPT 12.x 4 Byte, "4 Byte unsigned value"

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the data format is decimal.

Data formats: Format13

Data type: 4 Byte signed

Value range: -2147483648..2147483647 Decimal, x0..xffffffff Hexadecimal

Remarks: DPT 13.x 4 Byte, "4 Byte signed value "

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the data format is decimal, negative values are prefixed with "-".

Data formats: Format14

Data type: 4 Byte IEEE floating point according P754

Value range: 1.8446762e19, x0..ffffff Hexadecimal

Remarks: DPT 14.x 4 Byte," 4 Byte float value "

Concerning the value range and precision please read the related literature.

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

If given as hexadecimal the value must contain the floating point value already!

On receiving the data format is decimal with up to 8 fractional digits, negative values are prefixed with "-".

On very small or big values an exponential format may be generated.

There is no rounding mechanism on received values.

Data formats: Format15

Data type: 4 Byte access control

Value range: 0..4294967295 Decimal, x0..ffffff Hexadecimal

Remarks: DPT 12.x 4 Byte," 4 Byte unsigned value"

On sending either a decimal or an hexadecimal value may be specified.

Hexadecimal values must be prefixed with an "x".

On receiving the values are sent hexadecimal with 8 chars.

Data formats: Format16

Data type: Text string

Value range: 1 to 14 ASCII chars from 20h..0ffh.

Remarks: DPT 16.x 14 Byte," Character String "

Deviating from the DPT16.x specification exactly the given count of chars are transmitted. Therefore the string must be extended with blanks to get 14 chars transmitted. If the given text exceeds 14 chars the extra chars are ignored.

Data formats: Format17

Data type: Textstring, zero terminated

Value range: 1 to 13 ASCII chars from 20h..0ffh.

Remarks: DPT 16.x 14 Byte," Character String "

Internally there is an zero byte appended to the given text.

Deviating from the DPT16.x specification exactly the given count of chars are transmitted. Therefore the string must be extended with blanks to get 13 chars and the terminating zero transmitted. If the given text exceeds 13 chars the extra chars are ignored.

Data formats: Format18

Data type: 1 to 14 Byte Decimal format, Semicolon separated

Value range: Range per Byte 0..255

Remarks: The single byte values have to be separated by a semicolon char(,;“)

If the source address option is activated more than 64 chars may result on receiving. These will be limited to 64 chars.

Example: Send a 1 Byte Telegram: "Wga=127"

Send a 2 Byte Telegram: "Wga=127;0"

Send a 3 Byte Telegram: "Wga=127;0;100" ...

On receiving the data is formatted decimal, the values are semicolon separated.

Data formats: Format19

Data type: 1 to 14 Byte Hexadecimal format, Semicolon separated

Value range: range per Byte 0..ffh

Remarks: The single byte values have to be separated by a semicolon char (,;“).

Hexadecimal prefix neither needed nor allowed.

If the source address option is activated more than 64 chars may result on receiving. These will be limited to 64 chars.

Example: Send a 1 Byte Telegram: "Wga=7f"

Send a 2 Byte Telegram: "Wga=7f;0"

Send a 3 Byte Telegram: "Wga=7f;0;64" ...

On receiving the data is formatted hexadecimal, the values are semicolon separated.

Data formats: Format20

Data type: 1 to 14 Byte Hexadecimal format, unseparated

Value range: range per byte 0..ffh

Remarks: The different byte values must not be separated.
Hexadecimal prefix neither needed nor allowed.
For each byte value 2 chars must be transmitted.

Example: Send a 1 Byte Telegram: "Wga=7f"
Send a 2 Byte Telegram: "Wga=7f00"
Send a 3 Byte Telegram: "Wga=7f0064" ...

On receiving the data is formatted hexadecimal, the values are not separated,
for each byte 2 chars are generated.

Data formats: Format21

Data type: 1 to 6 Bit Hexadecimal format

Value range: 0..3fh.

Remarks: Hexadecimal prefix neither needed nor allowed.

Example: Send a 1-6 Bit Telegram: "Wga=01"

On receiving the data is formatted hexadecimal, 2 chars are generated.

Receive telegrams

Received telegrams containing group address data are first checked for „Echo“ (see option „OE“).
Then the device checks whether the target group address is enabled (see “Sga” command).
If the address is enabled the received datalength is compared with the setup data len.
If the length is different the Value field gets “?” assigned as content. Now the data is formatted as follows:

"N PH>GA=Value"

N= Telegram number, only if "ON+"
PH= source address, only if "OS+"
GA= target address

Dependant on the Option „X“ those datas are formatted as

"017 12.03.127>0/3/49=..." or as "11 B37F>0331=..."

The data value itself is formatted depending on the selected data format.

Example telegram hexadecimal: 13 000A>0003=0

Example telegram decimal: 026 00.00.010>00/0/003=0

Basic parameterization with the AVIT Terminal-Program

The basic parameterization of the EIB-Mediatechnik-Gateway can be easily done with the AVIT Terminal-Program.

This terminal-program is located in the installation folder of the Mediatechnik-Gateway and can be started with a double click on the file AVITTerminal.exe.

First you have to configure the settings for the serial interface in the program by clicking in the menu on „Settings“ and then on the item „Schnittstelle / Allgemeine Einstellungen“. In the appearing dialog you have to apply the following settings:

Interface: COM port, where the gateway is connected to

Baudrate: 38400

Databits: 8

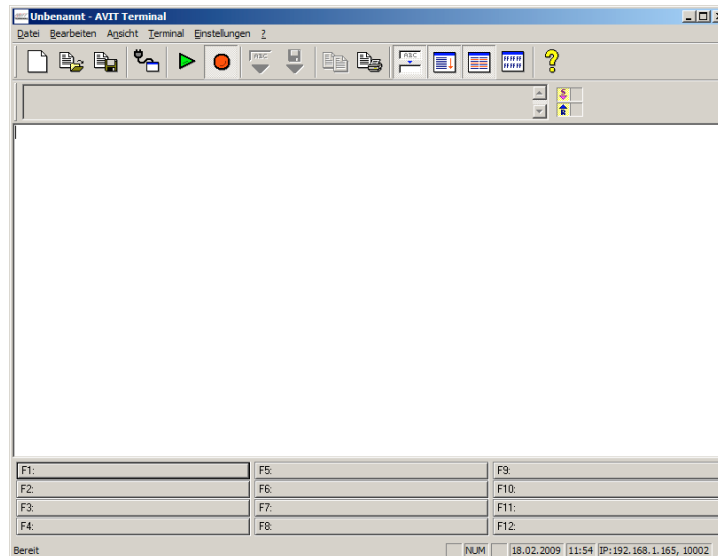
Stopbits: 1

Parity: N (keine)

Protocol: Hardware (RTS/CTS)

The dialog must be closed with the button „OK“.

Now the connection to the CT-KNX/IP Gateway can be opened, while clicking in the toolbar on Start (green arrow). To check the connection you now should request the version of the EIB-Mediatechnik-Gateway with the command „?V“. If the gateway doesn't answer, you should check if your connection settings are correct.



The dialog to parameterize the gateway is opened, when you click in the menu „Settings“ on “EIB-Weiche ASCII-Terminal/Medientechnik-Gateway“. The following dialog appears:

In chapter „Allgemeine Einstellungen“ the options of the CT-KNX/IP Gateway can be parameterized, like described above. We recommend to activate the following options. These options are also used in the AMX-example at the end of the documentation: D, E, G, H, Q, R, V.
The options N, S, W, X should be deactivated.

After you have applied the settings, it will be transferred to the Mediatechnic-Gateway if you click on the button „Übertragen“.

In chapter „Physical Address“ you can setup the physical address of the CT-KNX/IP Gateway.

In chapter „Gruppenadress-Einstellungen“ you can configure the group addresses for the Mediatechnic-Gateway. Over the button „Save“ the actual group address are save in a text file. The content of this text file can be used, to configure the Mediatechnic-Gateway with the address definitions. The configuration is done directly when you click on the button „Transfer“.

Attention: First the actual configuration of the group addresses in the gateway is deleted! Then only the configured group addresses are transferred.

The saved settings can be loaded again with the button „Load“. With the button „Import“ you can load the complete data of ein EIB project, that has been imported with EIB Explorer or the FIAVisManager. To do so you have to create a EIB Explorer or FIAVis Manager project in the according software and to import the EIB-addresses from an existing ETS-project.
Then you have to transfer the data into a directory. In the EIB Explorer software you have to select the menu item „Transfer data“ or in the FIAVis Manager the menu item „Transfer data to application“.
In the following window have have to select the option „EIB.VB directory“, configure the destination

directory and execute the transfer with the button „Start...“. The created GA-file contains all address informations and can be imported in the AVIT Terminal-Program.