

Short introduction and quickstart guide to the KNX-RS232-Gateway

The program is provided "As Is". Use this program at your own risk and without any warranty.

Anyway you need a good terminal program to test the communication with the device to control and to test the defined controlstrings. Very good experiences (especially with non-readable characters) have been made with [HTerm](#).

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1. Serial settings

The baudrate and the parameters of the serial line have to be defined.

Coding	Description
8N1	8 Bit, no Parity, 1 Stopbit
8N1,5	8 Bit, no Parity, 1,5 Stopbits
8N2	8 Bit, no Parity, 2 Stopbits
8E1	8 Bit, even Parity, 1 Stopbit
8O1	8 Bit, odd Parity, 1 Stopbit

2. Sending strings over the serial line

On reception of a knx-telegram a serial string shall be sent. The string is defined in the upper field of the program.

A new definition is inserted with the right mousebutton above one of the definitions.

Step	Field	Description
1	GA	Groupaddress in the form UG/MG/LG
2	Value	The object value (=0, <>0, ignore) on that the string is transmitted
3	KNX->RS232	The serial string
4	(Right mousebutton->Insert comment)	Add a comment for documentation purposes

Definition strings can consist of:

- Normal ("ASCII" readable) characters and numerals.
- (Hexa)Decimal characters.
- Characters generated by macro functions.

For the strings the following rules apply:

- Spaces are ignored. If one shall be sent it must be inserted with "#SP".
- Decimal values are inserted with "#" for example #49 for "1".
(A collection of the ASCII-codes can be found in the [ASCII-Table](#))

3) Hexadecimal values are defined with "\$" for example \$31 for "1".

4) Some predefined characters also start with "#" for example a space "#SP" (Space).

Macro	Decimal	Hex	Macro	Decimal	Hex	Macro	Decimal	Hex	Macro	Decimal	Hex	Macro	Decimal	Hex
#NUL	0	\$00	#BS	8	\$08	#DLE	16	\$10	#CAN	24	\$18	#SP	32	\$20
#SOH	1	\$01	#TAB	9	\$09	#DC1	17	\$11	#EM	25	\$19			
#STX	2	\$02	#LF	10	\$0A	#DC2	18	\$12	#SUB	26	\$1A			
#ETX	3	\$03	#VT	11	\$0B	#DC3	19	\$13	#ESC	27	\$1B			
#EOT	4	\$04	#FF	12	\$0C	#DC4	20	\$14	#FS	28	\$1C			
#ENQ	5	\$05	#CR	13	\$0D	#NACK	21	\$15	#GS	29	\$1D			
#ACK	6	\$06	#SO	14	\$0E	#SYN	22	\$16	#RS	30	\$1E			
#BEL	7	\$07	#SI	15	\$0F	#ETB	23	\$17	#US	31	\$1F			

5) Macronames are starting with a "#" and contain characters (and numerals) for example "#CS1".

Macros are functions, that insert characters at their position (for example the object value or a checksum).

Macro	Example string	Description
#DECVAL	Test_ #DECVAL _value	The received value is inserted. If the value is "13" then "Test_13_value" is sent.
#DECVAL:1	Test_ #DECVAL:1 _value	Same as #DECVAL but only one digit is used.
#DECVAL:2	Test_ #DECVAL:2 _value	Same as #DECVAL but always 2 digits are used.
#HEXVAL	Test_ #HEXVAL _value	Same as #DECVAL but as a hexadecimal number.
#OBJVAL	Test_ #OBJVAL _value	The received value is inserted as a character. if the value is 65, so "Test_A_value" is sent.
#CS1	#STX #\$0 #\$5 #ETX #CS1	A checksum is inserted, "\$02 \$00 \$05 \$03 \$0A " is sent (in hexadecimal values).

6) Comments can be inserted and edited with the right mousebutton above the definition and are displayed as a tooltip at the commented line.

3. Sending KNX-telegrams triggered by serial strings

On reception of a serial string a knx-telegram can be sent.

1) At **System->Settings** some parameters for the received strings can be set.

End of line can be "CR" , "LF" , "0" or "ETX" . Characters smaller then "Space" can be set to be ignored.

2) In the lower program field the received strings can be combined with addresses, object types and values.

3) Pressing the right mousebutton above the definitions field -> "Insert string" inserts a new definition

4) Comments can be inserted and edited with the right mousebutton above the definition and are displayed as a tooltip at the commented line.

Step	Field	Description
1	RS232->KNX	String definition
2	GA	Groupaddress in the form UG/MG/LG on that the telegram is sent if the sending conditions are met
3	Type	Objekt type that is sent on if the sending conditions are met

4	Value	Objekt value that is sent on if the sending conditions are met. This value can be overwritten by a macro.
5	(Right mousebutton->Insert comment)	Add a comment for documentation purposes

By means of the string definition it is decided if the sending conditions are met. For the strings the same rules apply as for the sending strings (according to 2.1 - 2.4). Additionally following rules apply:

- a) Macronames are starting with a "#" and contain characters (and numerals) for example "#DROPCHARS". A number is passed to the macro that is inserted after the macro (separated by a space)

Macros are functions that process the received serial string in the order of their definition. For example "#DROPCHARS 4" ignores the following 4 characters at the actual position. "#DROPCHARS 4 #DROPCHARS 5" is the same as "#DROPCHARS 9". When long strings are processed, possibly the maximum line length may be adjusted at **System->Settings->RS232-Settings**.

Macro	Example String	Description
#DROPCHARS	#DROPCHARS 4	The following 4 characters are discarded , "#DROPCHARS -1" discards all following characters
#CHECKCHARS	#CHECKCHARS 5	The following 5 characters are compared with the defined string. If they are the same, the sending condition is met.
#INTCHARS	#INTCHARS 2	The following 2 characters are interpreted as a number and inserted to the object value of the string to send. At least one character must be a numeral.
#STRCHARS	#STRCHARS 14	The following 14 characters are taken as the objects value. Only usefull with a 14-Byte-String type.
#DROPSACES	#DROPSACES 2	The following characters are ignored until two spaces are counted.

After the processing of the macros no character must be left. Surplus characters must be processed for example with "#DROPCHARS -1" or the like.

Beispiele:

"Test" equals "Test #CHECKCHARS 4"

The string "Test" meets the sending conditions.

"Test #DROPCHARS 3 #CHECKCHARS 4"

Each string of the form "***Test" meets the sending conditions.

"Test #DROPCHARS 3 #CHECKCHARS 4 #DROPCHARS -1"

Each string of the form "***Test...." meets the sending conditions.

"Test_ #DROPCHARS 3 #CHECKCHARS 5 #INTCHARS 2"

Each string of the form "***Test_XY" meets the sending conditions, if X and Y are numerals. The number overwrites the set value and is sent as the object value.

4. Managing macros

The available macros for the definitions can be edited at the menu item **"System->Macros"**. Macros can be edited, deleted or added if the macro editing is enabled in the system settings.

5. Connecting to the gateway and transferring data

As soon as the gateway is connected to the pc with a standard USB cable, the data connection can be established.

- 1) Push the "**Connect**"-Button to establish the data connection
- 2) Push the "**Transfer**"-Button to transfer the data to the gateway
After this, a single definition can be tested (right mouse-button above the definition ->"Send serial string") or the correct behavior for the serial or knx-data. After that:
- 3) Push the "**Save**"-Button to save the data in the gateway.

In the corner above the communicationbuttons the amount of used memory is displayed after the data transfer in 4-byte-words and in %.

6. Managing projects

With the **File->** menu in the task bar, projects can be imported, opened or saved with all settings.

With the menu item **File->Import** a "Tab" separated List can be imported from a file.

KNX->RS232:

Format: "In" Tab "Groupaddress" Tab "Value" Tab "Serial string" Tab "Comment" **End of line**

RS232->KNX

Format: "Out" Tab "Serial string" Tab "Groupaddress" Tab "Objekttype" Tab "Value" Tab "Comment" **End of line**

7. Troubleshooting

- 1) **Under some circumstances multiple error messages might occur.** Disconnect the USB cable and (if connected) the power supply. Press the T1 button and hold it pushed while reconnecting the device (hold it for 1 second). Afterwards the data transfer should be correct again.
- 2) **Under some circumstances it is impossible to program the physical adress.** Disconnect the USB cable and (if connected) the power supply. Press the PRG button and hold it pushed while reconnecting the device (hold it for 1 second). Afterwards the physical address should be programmable again.
- 3) **At "Connect" there is a message "No Device found".** Restart the device, to be shure you can follow precedure 1).
- 4) **At Data transfer a message XXX undef. comes up.** Probably a macro is missing or written wrong.