TCP/IP ASCII interface

Protocol guide

1. Introduction

The IRTrans ASCII interface serves to control IRTrans modules (either via irserver or directly when Ethernet modules with IRDB or LAN Controller are used) via TCP/IP using simple ASCII strings. The format of the ASCII Strings corresponds to those used as UDP ASCII Strings. Currently the following transactions are supported:

- Sending of IR commands
- Reception of IR commands
- Learning commands as hex code (since FW version 1.06.16)
- Sending commands as hex code (since FW version 1.06.16)
- Reception of commands as hex code (since FW version 1.06.16)

More functions will be added in the future. Due to limited memory size not all commands and options are supported when directly accessing the IRTrans Ethernet modules. You will get an error message when trying to use any unsupported function.

To use the ASCII interface the following minimum IRTrans software and firmware versions must be used:

- IR server   5.07.06
- IRTrans Ethernet IRDB (LAN firmware)   1.05.01
- IRTrans Ethernet IRDB (LAN firmware)   1.06.16 (for hex learn/send)
- Higher IR Server versions will support hex learn/send, too.

2. Establishing connection to IRTrans system / initialize ASCII mode

All kinds of communication use port TCP/21000. This port has been officially reserved for the IRTrans system, so no conflicts should occur.
First a connection to the system needs to be established using the following procedure:

- Open port TCP/21000 of the irserver / IRTrans module
- Send 4 Bytes „ASCI" to the open connection

  Important: These bytes MUST be sent prior to anything else, capital letters must be used. No additional characters such as <CR> or <LF> allowed.

- In case IR commands also need to be received as hex codes the initialization is done by sending the 4 bytes „ASCR" instead. This should only be used when reception of hex codes is needed. It is **not** needed for learning and sending.

Now the TCP connection is in ASCII mode and can be controlled using ASCII sequences. Status messages are now output in ASCII format accordingly.

3. Disconnecting from IRTrans system

An explicit procedure is not needed to disconnect from IRTrans server or module. Simply closing the TCP/IP connection is enough.

4. ASCII command syntax

Every IRTrans ASCII command is preceded by an „A" (capital A) so the system can distinguish it from other commands. The command string must be terminated using <CR> (ASCII 13), <LF> (ASCII 10) or both.

Important: commands not matching this convention will be discarded.

5. Sending IR commands

The „snd" command - preceded by the „A" - can be used to send IR commands.

When directly accessing the Ethernet module its built-in IRDB is addressed. This means that the IR commands must have already been uploaded to the IRDB using the GUI client.

Parameters are the same as when sending via UDP:

```
Asnd <remote>,<command>,[l<led>],[b<bus>],[m<mask>]
Asndr <remote>,<command>,[l<led>],[b<bus>],[m<mask>]
```

<remote> and <command> are the names of the remote and command as learned.

<led>   can be used to choose the internal (i), external (e) or both (b) LEDs.

          If using IRTrans modules with more than one IR output (PoE with 2X option, LAN Controller, LAN Controller XL) all outputs can be explicitly addressed using LED values 1-8. (PoE 2X: 1-2, LAN Controller: 1-4, LAN Controller XL: 1-8)

          Omitting this parameter causes the device setting's default values to be used.

<bus>   directly addresses the IRTrans Ethernet/USB/RS232 module that you want to send the command. Of course this parameter cannot be used when directly connecting to an Ethernet module.

          Here the default is to send via all modules connected.

<mask>   This sets the net mask that chooses the modules connected through the IRTrans Serial Bus. A 16 bit mask is used which each bit representing one of the bus's addresses. This parameter is only available if accessing the IRTrans Server or IRTrans LAN Controller/XL.

          Default is to send using all modules connected to the internal bus.

The „Asndr" command sends the repeat codes (if applicable).

6. TCP/IP ASCII interface's status message format

All status messages of the ASCII interface have the same basic layout:

```
**00023 RESULT_SEND OK
```

1. The two „**" indicate the beginning of an ASCII status message
2. They are followed by a 5 digit value telling the total length of the string in bytes
3. The message itself
4. The string is terminated by <LF> (ASCII Code 10)

This format is used to return all results, alerts and confirmation messages, including IR codes received.

A few examples of sending commands and status codes:

Sent successfully:	`Asnd mediacenter,play` `**00018 RESULT OK`
Unknown remote control:	`Asnd sony,play` `**00047 RESULT Error: Remote Control not found`
Unknown command:	`Asnd mediacenter,x` `**00047 RESULT Error: Remote Command not found`

7. Reception of IR codes using the TCP/IP ASCII interface

IR codes received are also output to the ASCII client in standard result format (see above). Here's an example:

```
**00037 RCV_COM mediacenter,play,0,0
```

The standard message header (`**00037`) precedes the keyword `RCV_COM` followed by the command data separated by commas:

*   Remote control name
*   Command name
*   Bus ID (always 0 with Ethernet modules)
*   IRTrans Bus Device ID (always 0 without bus modules)

This string is terminated with <LF> (ASCII Code 10), too.

Important: Only IR commands found in the database will be output.
Unmatched commands are ignored for performance reasons.

8. Retrieving a list of remotes

Important: this function is available since LAN firmware version 1.05.07

A list of remote controls currently residing in the IR database of an IRTrans LAN module can be requested using the following command:

```
Agetremotes [offset]
```

The optional parameter offset specifies the position where to start the listing. This is due to the fact that only three entries are returned at a time.

This is what the result looks like

```
Agetremotes 0
**00051 REMOTELIST 0,6,3,irtrans,loewe,mediacenter
```

The three digits returned are the offset chosen (0 in this case), the total amount of remotes found (6 here) and the amount of entries returned (3, being the maximum value).

To retrieve the next few remotes call:

```
Agetremotes 3
**00061 REMOTELIST 3,6,3,metz-tv,panasonicplasma,philips_dvd
```

Repeat the command until all names of remotes defined have been listed.

9. Retrieving a command list for a specific remote control

Important: this function is available since LAN firmware version 1.05.07

A list of a remote control's commands residing in the LAN module's IR database can be retrieved using the command

```
Agetcommands <remote>,[offset]
```

The parameter remote (mandatory) chooses the remote control whose commands you want to be listed. The optional parameter offset again sets the position in the list to start with. A maximum number of 12 commands can be listed at a time.

The result looks like this:

```
Agetcommands irtrans,0
**00059 COMMANDLIST 0,33,12,power,mute,1,2,3,4,5,6,7,8,9,0
```

Again the three digits are the chosen offset (0 here), the total amount of commands found (33) and the number of entries returned (12 in this case). As above this command can be repeated with increasing offsets to have all commands listed.

10. Learning IR commands as hex code

Important: this function is available since LAN firmware version 1.06.16

Parameter format up to LAN firmware version 1.06.40:

This command allows you to learn and store IR commands from within your own software. The commands are transferred as hex strings:

```
Alearn [M<mode>],[I<IR Timeout>],[X],[R<Receiver-to-use>],[T<timeout>]
```

Description of parameters:

M0	Standard learning mode *(Default)*
M1	Learning of repeat codes
M2	Learning of RAW codes
M3	Learning of RAW repeat codes
I0	IR timeout default *(as preset in the device's settings)*
I1	IR timeout 5 ms
I2	IR timeout 15 ms
I3	IR timeout 30 ms
I4	IR timeout 60 ms
I5	IR timeout 90 ms
I6	IR timeout 120 ms
I7	IR timeout 150 ms
I8	IR timeout 250 ms
X	Learning of long IR codes (e.g. for air conditioning devices)
RS	Use standard IR receiver (38kHz)
RH	Use HF IR receiver (455kHz)
T10	Time to wait until RC key is pressed (in seconds) *(default = 10s)*

If a parameter is omitted the default values or the IRTrans's device settings will be used.

The result is returned in standard message format:

```
Alearn
**00131 LEARN 3A00000000000E24040000000000000000000000000000000000000000000000
0000000000000000000000025731313030303030303031313031
```

The hex string following "LEARN" represents the IR command received. It can be stored and used for either sending or matching an IR command received.

Parameter format from LAN firmware version 1.07.00 upwards:

```
Alearn [M<mode>],[I<IR Timeout>],[X<Calibration Mode>], [T<IR Tolerance>],
[R<Receiver-to-use>],[W<Waittimeout>]
```

Description of parameters:

M0	Standard learning mode *(Default)*
M1	Learning of repeat codes
M2	Learning of RAW codes
M3	Learning of RAW repeat codes
I0	IR timeout default *(as preset in the device's settings)*
I1	IR timeout 5 ms
I2	IR timeout 15 ms
I3	IR timeout 30 ms
I4	IR timeout 60 ms
I5	IR timeout 90 ms
I6	IR timeout 120 ms
I7	IR timeout 150 ms
I8	IR timeout 250 ms
X	Calibration byte for long IR codes
X1	Every 10 Bytes
X2	Every 30 Bytes
X3	Every 75 Bytes
R	IR receiver to use / parameter
I	Internal IR receiver (works with IRTrans modules equipped with electronic switching only)
E	External IR receiver (works with IRTrans modules equipped with electronic switching only)
1	IR receiver 1 (standard receiver)
2	IR receiver 2 (HF receiver)
3	38 kHz receiver
5	56 kHz receiver
4	455 kHz receiver
P	Plasma shielded 455 kHz receiver
C	Learning receiver with carrier detection
	Example: RE2C -> external learning receiver connected to input 2
W10	Time to wait until RC key is pressed (in seconds) *(default = 10s)*
B	Learning of B&O™ codes
S	No sorting of timings inside IR codes
T	Tolerance while learning codes
T0	64 µs
T1	96 µs
T2	120 µs
T3	160 µs
T4	320 µs
T5	480 µs
T6	680 µs
T7	960 µs

A corresponding status message is output as result (see above).

11. Sending commands as hex code

Important: This function is available since LAN firmware version 1.06.16

This command provides the ability to send commands that have been learned as hex codes. Some additional parameters can be used here:

```
Asndhex [L<LED Select>],[M<Sendmask>],[C<IR Carrier>],[R<Repeat Count>],
[P<Repeat Pause>],<H Hexdata>
```

All parameters except the hex string itself are optional.

Description of parameters:

LD	Use default LED
LI	Use internal LEDs
LE	Use external LEDs
LB	Use all LEDs
L1-L8	Use external LED 1-8 (if available)

M<VAL> Sendmask (16 bit bitmask, values 1-65535) to address IRTrans Serial Bus modules. Only used with IRTrans Serial Bus.

C<FRQ> IR carrier frequency (15-455 kHz). Optional, only needed in cases where the IRTrans could not detect or measure the carrier frequency.

R<CNT> Repeat count of an IR command. Usually IRTrans detects this automatically when learning.

P<VAL> Repeat pause: gap between repetitions of an IR command (in ms). Usually IRTrans detects this automatically when learning.

H<HEX> Hex data that have been learned for this command. They must be a long string without any characters other than 0-9/A-F.

Example of a sndhex command:

```
Asndhex H3A00000000000E240400000000000000000000000000000000000000000000000
000000000000000002573131303030303030303031313031
**00018 RESULT OK
```

The result code indicates whether the command has been processed correctly.

12. IRTrans firmware version

Important: this function is available since LAN firmware version 1.07.00

This command returns the firmware version of both the Ethernet controller and the IR controller:

```
Aver
```

```
**00034 VERSION E6.00.04 L1.07.00
```

E6.00.04 is the firmware version of the IR controllers
L1.07.00 is the firmware version of the Ethernet controller

13. Receiving commands as hex code

Important: this function is available since LAN firmware version 1.06.16

As an alternative it is possible to get IR commands received in hex code format. To achieve this the TCP connection must be established in RAW mode by using the "ASCR" code when initializing the connection. See chapter 2 of this guide for further info.

Due to certain overhead during transmission of commands the hex command mode should only be activated when needed.

When receiving IR command the raw IR Data package is transmitted only. No additional information such as IR timing data or frequencies are included. Such a code cannot be used for sending.

An example:

```
**00075 RCV_HEX 3534303030322313330303030303030303030303332303030303031333030
```

An ASCII string like this can be matched to a learned command (including timing data).
This can be done by ignoring the leading 88 digits (=44 Bytes) of the hex string learned.
So the comparison starts at position 88 (counting from 0) of the hex string:

```
**00161 LEARN 4900000000001D2700002100430020004200210 0C700000000002300220046 00
46006500EF00000000006010 03534303030322313330303030303030303030303332303030303031 33
3030
```

In this example only the digits marked red are compared.

The IRTrans module transmits a RCV_HEX status via TCP/IP for every IR code it receives.