MidiMux Firmware

User's Manual

Contents

The information in this manual was compiled with care and to our best knowledge; nevertheless there are probably some errors left in this document. We do not take legal or any other responsibility for the correctness of any information.

We are happy to receive your feedback. If you found an error or think that something should be explained in greater detail, don't hesitate to contact us.

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0 Definition

The SR-Systems MidiMux is a small, efficient four-port DVB transport stream multiplexer. The firmware provided by maintech allows the control of other SR-Systems components like NIMs, ASI in/out and the MiniMod.

1 Frontpanel

The MidiMux can be controlled via an optional LCD/keypad unit connected to the frontpanel connector. The frontpanel consists of a LC Display, several LEDs and buttons.
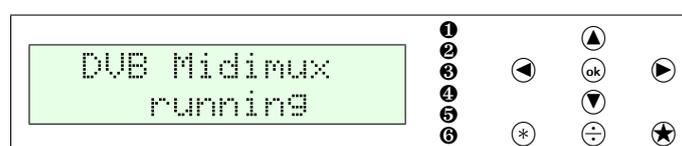
Figure 1: Frontpanel display and button arrangement

❶   Power LED
❷   –
❸   –
❹   FPGA Status LED
❺   Output Device Status LED
❻   MiniMod ON-AIR LED

★   Enter and exit the menu, abort data entries
ok   Edit the current menu item and commit the changes
▲ ▼   Browse menu categories, change character while editing an item
◀ ▶   Browse menu items within a category, move cursor while editing an item
✳   Switch display backlight on and off
÷   not used

1.1 Status Screen

Under normal conditions, the frontpanel display shows the MidiMux status screen. On this screen, the first line shows the product name, which can be slightly different from the example shown here. The second line shows the current status code. See the *MidiMux Status Codes* in section 5 on page 25 for a list of possible messages and their meaning.

Figure 2: MidiMux status screen without and with error message

1.2 Configuration Menu

Whenever you see the status screen on the frontpanel display, pushing the ✪ button enters the configuration menu. The menu items are grouped in various categories. To select a category, use the ⓐ and ⓥ buttons. The ◀ and ▶ buttons will browse the items within the selected category. Use the ⓐ and ⓥ buttons again to select a different category. See *MidiMux Menu Structure* in section 3 on page 6 for a list of all available categories and menu items. Press the ⓞⓚ button to edit the menu item currently displayed. Press the ✪ button to exit the menu and return to the status screen.

Figure 3: Category and menu item selection

After selecting an item for editing with the ⓞⓚ button, the value can be changed with the ◀ and ▶ buttons. If the item does not represent a distinct set of options but a number or a text string, the ◀ and ▶ buttons move the cursor and ⓐ and ⓥ change the character under the cursor. Use the ⓞⓚ button to save the changes and press the ✪ button to revert the modifications and return to the item selection.
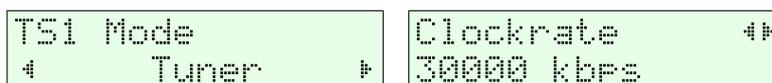
Figure 4: Editing an item with distinct options and a string item

2 Controlling the MidiMux via the RS232

All configuration options that are available on the frontpanel can also be modified via the RS232 interface on the MidiMux PCB. Please refer to the MidiMux hardware datasheet[1] for the pinout.

2.1 Establishing a Connection

The RS232 interface can be used with standard terminal software, e.g. HyperTerminal (included with some versions of the Windows operating system), Putty[2] or any other VT100 compatible terminal software. Set your PC serial port to 115200 Baud, eight bits per character, no parity, one stopbit (115k2–8N1) and disable any flow control.

When powering up your MidiMux, you should see a boot message similar to this example:

```
DVB Midimux Firmware V6.9
(c) 2009 maintech GmbH


FPGA firmware v004 successfully uploaded
```

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[1] MidiMux hardware datasheet: http://www.maintech.de/fileadmin/Datasheets/DVB-MidiMux_v5.1_Datasheet-v1_en-1.pdf
[2] Download Putty at http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

2.2 Changing Settings

After the boot process is complete, the MidiMux displays its main menu, which also can be re-displayed by pressing Enter in the terminal software.

```
Midimux Mainmenu
1) show status
2) Port configuration
3) Output Settings
4) PSI Settings
5) Serial Bridge Settings
> _
```

The contents of the main menu depend on the connected transport stream sources and other settings – a tuner will need other settings than the MPEG2 encoder.

A menu option is selected by entering its number followed by pressing Enter .

3 Menu Structure

3.1 Port Configuration

3.1.1 TS x Input Mode / TS x Mode

This menu item tells the MidiMux, what kind of devices are connected to the TS input connectors. The item appears once for each of the four TS input ports.

Selected Value	Description
disabled	The MidiMux will not use the TS input port
MPEG Encoder	The MidiMux will configure and control an SR-Systems MPEG2 encoder module connected to the TS input port
Tuner	The MidiMux will configure and control an SR-Systems tuner module (NIM). Supported tuner modules are: • DVB-S tuner (Datasheet: http://www.maintech.de/DSNS1) • STV0297 DVB-C tuner (Datasheet: http://www.maintech.de/DSNC1) • DiBcom 3000 DVB-T tuner (diversity or single) (Datasheet: http://www.maintech.de/DSNTD or http://www.maintech.de/DSNT1) • NXT6000 DVB-T tuner With firmware version 6.10 or later, the MidiMux will also control SR-Systems intelligent tuner modules. Intelligent tuner modules can be used standalone and be configured via display or serial port. When they are connected to a MidiMux with firmware version 6.10 or later, the MidiMux will control the tuner module, and the tuner's local settings are disabled. Plase note that for this feature the NIM's firmware version must be 0.28 or later. Supported intelligent tuner modules are: • ATSC tuner (Datasheet: http://www.maintech.de/DSIA1) • DiBcom 7000 (Datasheet: http://www.maintech.de/DSIT1) • DVB-S/S2 tuner (Datasheet: http://www.maintech.de/DSIS2) The MidiMux automatically detects the connected tuner type.
ASI	The MidiMux will control an SR-Systems ASI input module (ASI-In) on the TS input port.
TTX	The MidiMux will configure and control an SR-Systems MPEG2 encoder with TeleText inserter connected to the TS input port.
generate clk	A transport stream is expected on the TS input port. The MidiMux will generate the TS clock with a clock rate configured in the menu item *TS In x Settings*. The data will be latched on rising clock edge.
external clk	A transport stream is expected on the TS input port. The MidiMux will expect a TS clock from the connected device. The data will be latched on rising clock edge. Use this setting when connecting one of the following devices: • MiniMux or MidiMux multiplexer (See the maintech application note http://www.maintech.de/fileadmin/Downloads/ChainingMultiplexers.pdf for information on how to chain multiplexers.) • legacy 4-TS multiplexer

Selected Value	Description

3.2 Output Settings

Options in the *Output Settings* submenu control how data is output on the TS output port.

☞ If a MiniMod is connected to the TS output port, there is a submenu *MiniMod Settings* available instead of the submenu *Output Settings*.

3.2.1 Clock direction / Clock

Selected Value	Description
external	The MidiMux expects a TS clock signal on the TS output port.
generate	The MidiMux generates a TS clock signal on the TS output port.

3.2.2 Clockrate

This option is only available if the output clock direction is set to *generate*. It configures the rate of the clock output on the TS output port and with that the output data rate of the multiplexer.

The TS output port outputs one byte each clock cycle. A data rate of 30000 kbps (thousand bits per second) results in a clock rate of 6000 kHz[3].

3.2.3 Framesize

Selected Value	Description
188 Byte	The data on the TS output port is sent in TS packets without Reed-Solomon error correction information. Each packet has a size of 188 Bytes of payload.
204 Byte	The data on the TS output port is sent in TS packets with Reed-Solomon error correction information. Each packet has a size of 204 Bytes (188 Bytes of payload plus 16 Bytes of error correction information).

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[3] See the maintech Application Note *About Bitrates*: http://www.maintech.de/fileadmin/Datasheets/Bitrates.pdf for more information on the clock and data rates on transport stream ports

3.3 MiniMod Settings

The *MiniMod Settings* submenu is only visible if a MiniMod was detected at the TS Output. All modulation settings of the MiniMod can be controlled from the MidiMux via this menu. Please see *MiniMod Remote Control* in section 6 on page 25 for instructions on how to connect MiniMod and MidiMux. For the configuration of the MiniMod, see the *MiniMod User's Guide*.[4]

3.4 PSI Settings

The MidiMux has a built-in PSI table generator which generates ETSI EN 300 468 compliant PSI and SI tables for up to four connected MPEG encoders or – in extended mode – for an arbitrary number of external services.

The configuration for the extended mode is created with the help of our maintech Mux Configurator[5] and uploaded to the multiplexer via XModem.

3.4.1 PSI Table Generator / PSI Tables

Selected Value	Description
disabled	The table generator in the MidiMux is disabled.
simple	The simple table generator, which generates tables for the encoders directly connected to the MidiMux, is enabled.
extended	The extended table generator, which is configured with the help of the maintech Mux Configurator, is enabled.

3.4.2 Stream ID

Set the transport stream ID that is transmitted in PAT, NIT and SDT for the encoded services.

3.4.3 Network ID

Set the network ID that is transmitted in the NIT for the encoded services.

3.4.4 Repetition

Set the PSI table repetition time in ms. Valid values are between 25 ms and 500 ms. Setting the repetition rate to 250 ms results in the complete set of PSI tables being transmitted 4 times per second.

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[4]   http://www.maintech.de/fileadmin/Downloads/MiniModUsersGuide.pdf
[5]   See http://www.maintech.de/en/support/information/ for the actual MuxConfigurator

3.4.5 Network Name

Set the network name that is transmitted in the NIT for the encoded services.

3.4.6 Upload PSI tables

☞   This menu item is only available if the extended table generator is enabled. It is also only accessible via the serial RS232 port.

Select this menu item to upload a binary configuration file generated by the maintech MUX configurator. After selection, you need to send the file via XModem.

3.5 TS In Settings

The *TS In Settings* submenu is shown for each TS input that is configured to *generate clock* or *external clock*.

3.5.1 Clockrate

☞   The menu item *Clockrate* is only shown if the TS input is configured to *generate clock*.

The TS input port reads one byte each clock cycle. A data rate of 30000 kbps (thousand bits per second) results in a clock rate of 6000 kHz. Please note that the clock rate at TS input ports is calculated for 204 Byte packets[6].

3.5.2 PSI Tables

This menu item controls if PIDs in the range from 0x0000 to 0x001F are passed through to the multiplexer. In a standard transport stream those PIDs contain the PSI tables, and therefore this option can be used to block those tables.

Selected Value	Description
pass	PSI Tables are not blocked.
block	PSI Tables are blocked.

3.6 Encoder Settings / TTX Settings

The *Encoder Settings* (*TTX Settings*) submenu is shown for each TS input that is configured to *MPEG2 Encoder* (*TTX*) (see 3.1.1).

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[6]   See the maintech Application Note *About Bitrates*: http://www.maintech.de/fileadmin/Datasheets/Bitrates.pdf for more information on the clock and data rates on transport stream ports.

3.6.1 System Bitrate

Set the encoder's system bit rate (audio, video and tables) to the given value. The modulator does not check if your configured system bitrate fits into the bandwidth provided by the configured modulation settings. The user has to make sure that the system bitrate is at least 3% below the modulation bitrate. Please enter a bitrate value based on 188-byte-packets in kBit/s with possible values between 1000 kBit/s and 20000 kBit/s. If the given value is too low, the encoding process will stop at the first buffer overflow.

3.6.2 Video Input

This selects the used hardware input for the video signal.

Selected Value	Description
disabled	Do not encode a video signal. The stream will be announced as radio service.
CVBS	Encode signal from the encoder's CVBS input.
YC	Encode signal from the encoder's Y/C (S-Video) input.
YCbCr	Encode YCbCr signal from the encoder's external video connector. Pin 10 is Y, pin 12 is Cb, Pin 14 is Cr.
RGB	Encode RGB video signal from the encoder's external video connector. Pin 10 is green, pin 12 is blue, pin 14 is red.
SCART	Encode RGBS (RGB with external sync) video signal from the encoder's external video connector. Pin 8 is sync, pin 10 is green, pin 12 is blue, pin 14 is red.
SDI	Encode signal from the attachable SDI input board.

☞ YCbCr, RGB and SCART are only available if a newer encoder board with TVP video decoder-chip is connected. Older encoders with SAA video decoder only support CVBS and Y/C. See the MPEG encoder datasheet at http://download.sr-systems.de/Desc/MPEG-Encoder-V4_Desc-en_075dpi.pdf for information about the external video connector.

3.6.3 Video Format

The *Video Format* menu item configures the encoder to the format that is used on the input signal.

☞ The Video Format configuration is not available when SDI is selected on an encoder with a new SDI input extension board. The SDI extension board will autodetect the video format in that case.

Selected Value	Description

...continued from previous page

Selected Value	Description
PAL	Standard PAL television signal
PAL-60	The video signal is interpreted as PAL-60 (PAL with 60 Hz and 525 lines)
PAL-M-60	The video signal is interpreted as PAL-M (PAL with 60 Hz and 525 lines)
PAL-N	The video signal is interpreted as PAL-60 (PAL with 60 Hz and 525 lines)
NTSC	The video signal is interpreted as NTSC
NTSC-4.43	NTSC with color carrier at 4.43 MHz
SECAM	The video signal is interpreted as SECAM

☞ PAL-60, PAL-M, PAL-N and NTSC-4.43 are only available if a newer encoder with TVP video decoder is connected. Older encoders with SAA video decoder only support PAL, NTSC and SECAM.

3.6.4 Video Resolution / Resolution

Selected Value	Description
D1	The video image is encoded with full resolution: 720x576
HD1	The video image is encoded with half resolution: 360x576
CIF	The video image is encoded with quarter resolution: 360x288

3.6.5 Video GOP Mode / GOP Mode

The *GOP Mode* menu item defines how the encoder uses different frame types while encoding the video stream.

Selected Value	Description
I	Each GOP consists only of I-frames
IP	The encoder uses one I-frame and then only P-frames inside a GOP. For a GOP size (see 3.6.6) of ten, the resulting GOP will look like this: IPPPPPPPPP.
IBP	The encoder uses an I-frame at the beginning of the GOP and encodes the rest in B and P frames. For a GOP size of ten, the resulting GOP will look like this: IBPBPBPBPB.
IBBP	The encoder uses an I-frame at the beginning of each GOP and encodes the rest in B and P frames. For a GOP size of ten, the resulting GOP will look like this: IBBPBBPBBP.

3.6.6 Video GOP Size / GOP Size

The *GOP Size* menu item defines how long each group of pictures from the encoder will be. Possible values are from 1 to 250. Depending on the *GOP Mode* setting, this value might be rounded up to the next multiple of 2 or 3.

3.6.7 Video AGC

The *Video AGC* menu item controls the automatic gain control of the video input.

Selected Value	Description
disabled	The video gain is set manually using the *Video Gain* setting.
enabled	The automatic gain control of the video input is active.

☞ The video AGC and video gain settings are not available for older encoders with SAA video ADC. If the input is set to SDI, the video AGC is also not available.

3.6.8 Video Gain

The *Video Gain* menu item controls the video gain if the automatic gain control is disabled. Possible values are from 0 to 300 where 148 is the default value.

3.6.9 Audio Input / Audio

This menu item decides if audio is encoded and transmitted. For video-only mode, set this to *disabled*.

Selected Value	Description
disabled	No audio data is encoded and transmitted.
analog	Audio is encoded from the encoder's analog inputs.
SDI	Audio is extracted and encoded from the attached SDI input port.

3.6.10 Audio Channel

This menu item selects the audio channels for de-embedding from SDI. It is only available when a SDI input module with support for embedded audio is connected to the TS input port.

Possible values are: 1.12, 1.34, 2.12, 2.34, 3.12, 3.34, 4.12 and 4.34.

3.6.11 Audio Volume

The *Audio Volume* menu item lets the user attenuate the received SDI audio signal before encoding. It is only available when a SDI input module with support for embedded audio is connected to the TS input port. Possible values are in the range 0 dB to -60 dB.

3.6.12 Audio Mode

Configures the audio channel mode for the encoded audio data.

Selected Value	Description
Stereo	The audio from the left and right input is encoded as stereo signal.
Joint Stereo	Stereo encoding with better quality but less stereo channel separation.
Dual Channel	The signal from the left and right input is encoded as two separate mono channels.
Single Channel	The audio is encoded as single mono channel.

3.6.13 Audio Samplerate / Samplerate

Configures the sample rate for analog audio input.

Possible values are: 32 kHz, 44.1 kHz, 48 kHz.

3.6.14 Audio Bitrate / Bitrate

Configures the bitrate that the encoder uses for audio encoding. More bitrate results in better audio quality. Possible values depend on the selected *Audio Mode* (see 3.6.12).

Possible values for **Stereo**, **Joint Stereo** and **Dual Channel**: 64, 96, 112, 128, 160, 192, 224 and 256 kBit/s. CD quality is reached at approx. 224 kBit/s.

Possible values for **Single Channel**: 32, 48, 56, 64, 80, 96, 112, 128, 160 and 192 kBit/s. CD quality is reached at approx. 160 kBit/s.

3.6.15 Program Video PID / Video PID

Set the DVB PID used to transmit the video data. Valid values are between 0x0020 and 0x1FFE. The video PID must be unique – make sure that it is not used for anything else (e.g. audio, PMT, etc.) If you plan to multiplex multiple streams, make sure that the video PID is unique among all other PIDs in the resulting multiplex.

3.6.16 Program Audio PID / Audio PID

Set the DVB PID used to transmit the audio data. Valid values are between 0x0020 and 0x1FFE. The audio PID must be unique – make sure that it is not used for anything else (e.g. video, PMT, etc.) If you plan to multiplex multiple streams, make sure that the audio PID is unique among all other PIDs in the resulting multiplex.

3.6.17 Program PMT PID / PMT PID

Set the DVB PID used to transmit the PMT for the encoded service. Valid values are between 0x0020 and 0x1FFE. The PMT PID must be a unique PID that is not used for video, audio or anything else. If you plan to multiplex multiple streams, make sure that the PMT PID is unique in the whole multiplex.

3.6.18 Teletext PID

Set the DVB PID used to transmit teletext data for the encoded service. Valid values are between 0x0020 and 0x1FFE. The teletext PID must be a unique PID that is not used for video, audio, PMT or anything else. If you plan to multiplex multiple streams, make sure that the teletext PID is unique in the whole multiplex.

☞ This menu item is shown only if a TTX inserter is connected to the TS input and the input mode is set to TTX.

3.6.19 Program ID

Set the service ID transmitted in the PAT, PMT, NIT and SDT.

3.6.20 Program Provider / Program Prov.

Set the service provider name transmitted in the SDT.

3.6.21 Program Name

Set the service name transmitted in the SDT.

3.6.22 LCN mode

Determines if a Logical Channel Number for this service is sent in the NIT.

Selected Value	Description
disabled	No Logical Channel Number is signalled for the service.
visible	The Logical Channel Number is signalled as visible channel.
hidden	The Logical Channel Number is signalled as hidden command.

3.6.23 LCN number

Set the Logical Channel Number that is sent in the NIT for this channel.

☞   This menu item is only shown if *LCN mode* is set to *visible* or *hidden*.

3.7 Tuner Settings – Basics

The *Tuner Settings* submenu is available when a TS input is configured to *Tuner* mode (see 3.1.1) and a compatible NIM (network interface module) is attached to the TS input port. The MidiMux will automatically detect the tuner type and display the corresponding settings.

3.7.1 Frequency

All NIM modules need a frequency to tune onto. The frequency is given in kHz and refers to the center of the channel. See the specific sections for DVB-T, -S and -C for the allowed ranges.

3.7.2 PSI Tables

This menu item configures if the PSI Tables (PIDs below 0x20) are forwarded to the multiplexer or blocked at the tuner input port.

Selected Value	Description
pass	All PIDs from the tuner will be passed to the multiplexer.
block	Only PIDs with values of 0x20 or above are passed to the multiplexer. PSI tables which are on the PIDs below 0x20 are blocked.

3.8 Tuner Settings – DVB-T

These menu items are displayed when a DVB-T NIM is attached to the MidiMux.

☞   FEC, constellation setting and guard interval are automatically detected from the TPS bits embedded into the carrier. Only frequency and bandwidth need to be set to receive a signal.

3.8.1 Frequency

Set the reception frequency for the DVB-T tuner in kHz. Valid values are between 145000 kHz and 858000 kHz. The DVB-T frequency refers to the center of the channel – independently of the bandwidth.

3.8.2 Bandwidth

Set the reception bandwidth for the DVB-T tuner in MHz. Valid values are between 1 MHz and 8 MHz.

3.9 Tuner Settings – DVB-S

These menu items are displayed when a DVB-S NIM is attached to the MidiMux.

3.9.1 Frequency

Set the reception frequency for the DVB-S tuner in kHz. Valid values are between 950000 kHz and 2150000 kHz.

☞ The MidiMux does not account for the LOF of an LNB that you might use. If you use an LNB to receive the DVB-S signal, you need to calculate the IF and set the frequency to that value.

3.9.2 Symbolrate

Set the reception symbol rate for the DVB-S tuner in kSym/s. Valid values are in the range between 1000 kSym/s and 45000 ksym/s.

3.9.3 LNC Power

Selected Value	Description
Off	The DVB-S tuner does not supply power to the HF input.
13V	The DVB-S tuner supplies 13V to the HF input.
18V	The DVB-S tuner supplies 18V to the HF input.

☞ The supply of 13 or 18V to the HF input works only if you have connected an additional 24V power supply to your DVB-S tuner. The NIM does not contain a step-up regulator.

3.9.4 LNC 22kHz Tone

Selected Value	Description

Selected Value	Description
Off	The DVB-S tuner does not apply 22kHz to the LNC power supply.
On	The DVB-S tuner applies 22kHz signal tone to the LNC power supply.

☞　The 22kHz tone works only if you have connected an additional 24V power supply to your DVB-S tuner and if you have selected 13V or 18V as LNC power.

3.10 Tuner Settings – DVB-C

These menu items are displayed when a DVB-C NIM is attached to the MidiMux.

3.10.1 Frequency

Set the reception frequency for the DVB-C tuner in kHz. Valid values are between 47000 kHz and 866000 kHz.

3.10.2 Symbolrate

Set the reception symbol rate for the DVB-C tuner in kSym/s. Valid values are in the range between 1000 kSym/s and 7000 ksym/s.

3.10.3 Constellation

Set the reception constellation for the DVB-C tuner.

Possible values are: QAM16, QAM32, QAM64, QAM128 and QAM256.

3.11 Serial Bridge Settings

The MidiMux is capable of bridging serial data (from a GPS device, for example) over a DVB stream. This feature consists of two mechanisms: Injection and Extraction.

Injection means the encapsulation of RS232 data, which the MidiMux receives on a serial port, into TS packets and sending those packets on the TS output port.

Extraction means reading TS packets with a specific PID from a specific port and transmitting their contents on the serial port.

When combining both mechanisms, you can build a system that transmits serial data along with video and audio services. You could even build a bidirectional serial bridge system.

3.11.1 Baudrate

This setting configures the baud rate that is used for transmitting and receiving on the serial port. Possible values are: 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.

3.11.2 Injection

Selected Value	Description
disabled	Serial Injection is disabled.
enabled(block)	The MidiMux reads data from the serial port and embeds this data into the transport stream using packets with the PID configured under *Injection PID*. This PID is blocked on both TS inputs to make sure that the serial link is not disturbed by data from the TS input. This is the recommended setting.
enabled(pass)	The MidiMux reads data from the serial port and embeds this data into the transport stream using packets with the PID configured under *Injection PID*. Packets with that PID coming from one of the input ports are **not** blocked. This means that serial data coming from one of the input ports on this PID gets mixed with the inserted serial data. This might lead to unexpected behaviour.

3.11.3 Extraction

Selected Value	Description
disabled	Serial Extraction is disabled.
enabled(block)	The MidiMux receives TS packets with the PID configured under *Extraction PID* from the port configured under *Extraction Port*. The contents of those packets are output on the serial port and the TS packets are **not** forwarded to the output. This is the recommended setting.
enabled(pass)	The MidiMux receives TS packets with the PID configured under *Extraction PID* from the port configured under *Extraction Port*. The contents of those packets are output on the serial port and the TS packets are also forwarded to the output. A second MidiMux or RS232 extractor could extract the same data or the data could be forwarded to another receiver.

3.11.4 Injection PID

This menu item configures the PID used for RS232 injection, if enabled. Choose a PID that is unique in your system – do not mix audio, video or other PIDs with serial data PIDs.

3.11.5 Extraction Port

This menu item configures which MidiMux input port is used for RS232 extraction. Only data coming from that port will get extracted and transmitted on the RS232 port.

3.11.6 Extraction PID

This menu item configures the PID used for RS232 extraction, if enabled. Choose the same PID as you used as Injection PID on the device where the RS232 gets injected.

4 Verbose Status Report

When controlling the MidiMux via the RS232 serial port as described in section 2, you can get a verbose status report from the MidiMux by choosing option 1 (Show Status) in the main menu.

The meanings of the different lines in the verbose status reports are explained in the sections below.

4.1 Product/Version Information

```
DVB MidiMux CPU V6.9 FPGA 004
```

This line gives you information about the product (DVB MidiMux), the CPU and the FPGA software versions.

4.2 Global Status

```
Current Status: running
```

This line gives you information about the current global status of the MidiMux. The status message shown here is the same as shown on the frontpanel display. Detailed information on the possible status messages and their meaning can be found in section 5.

4.3 Input Status

```
Input status: 1:ON 2:OFF 3:OFF 4:OFF
```

This status line tells you which of the TS Input Ports are currently active and forwarding their data to the TS output port.

4.4 Input Port Status

```
IN1: generate clock (30000 kBit/s)
IN2: input disabled
IN3: input disabled
IN4: input disabled
```

This status line tells you about the status of each TS input port that is set to *disabled*, *external clock* or *generate clock*. If the port is set to *tuner*, *ASI* or *encoder*, different status lines which are explained in the following sections are shown.

Status Display	Description
input disabled	The TS input port has been disabled.
external clock	The TS input port has been configured to receive TS clock and data from an external device.
generate clock (... kBit/s)	The TS input port has been configured to provide TS clock to and receive data from an external device. The TS clock is set up to receive the specified bitrate on the port.

4.5 ASI Input Status

```
IN1: ASI In HW Error
IN2: ASI In V34 locked
IN3: disabled
IN4: disabled
```

This status line tells you about the status of a TS input port that is set to ASI and the status of the connected ASI input module. It is only shown if a TS input port is set to ASI.

Status Display	Description
ASI In V... locked	The TS input is ok and locked to a ASI signal. The firmware version of the ASI input module is shown in the status message.
ASI In V... not locked	The TS input is ok but not locked to a ASI signal.
ASI In HW Error	The ASI input module was not detected or is faulty.

4.6 Tuner Status

```
IN1: [MB86A15] tuner locked
IN2: [DIB3000 4-Way] tuner error
IN3: disabled
IN4: disabled
```

This status line tells you about the status of a TS input port that is set to *tuner* and the status of the connected tuner module (NIM). It is shown only if a TS input port is set to *tuner*. The type of the detected tuner is displayed in square brackets.

Status Display	Description
MB86A15 DVB-S	A Fujitsu MB86A15 DVB-S tuner (SR-Systems DVB-S NIM) has been detected. Tuner settings for DVB-S are shown in the Tuner Settings menu.
STV0297 DVB-C	A ST Microelectronics STV0297 DVB-C tuner (SR-Systems DVB-C NIM) has been detected. Tuner settings for DVB-C are shown in the Tuner Settings menu.
NXT6000 DVB-T	A NextWave NXT6000 DVB-T tuner (SR-Systems DVB-T NIM) has been detected. Tuner settings for DVB-T are shown in the Tuner Settings menu.
DIB3000 DVB-T	A single DibCom DIB3000 DVB-T tuner (SR-Systems DVB-T NIM) has been detected. Tuner settings for DVB-T are shown in the Tuner Settings menu.
2x DIB3000	A DibCom DIB3000 dual diversity DVB-T tuner (SR-Systems DVB-T diversity NIM) has been detected. Tuner settings for DVB-T are shown in the Tuner Settings menu.

Status Display	Description
tuner not found	No tuner module was detected. Check the cable connecting the MidiMux and the tuner module.
tuner error	A tuner module was detected, but a fatal error occured while controlling the tuner module. The MidiMux continues trying to reinitialize the tuner. Check the cable connections and – if the problem persists – ask for support.
tuner not locked	A tuner module was detected and configured, but it could not lock to a signal. The MidiMux continues trying to retune to the signal. Check frequency and modulation settings in the Tuner Settings Menu.
tuner locked	A tuner module was detected, configured and locked to a signal.

4.7 Encoder Status

```
IN1: encoder running
IN2: encoder error (BOOT)
IN3: disabled
IN4: disabled
```

This status line tells you about the status of a TS input port that is set to *Encoder* and the status of the connected MPEG-2 encoder module. It is shown only it a TS input port is set to *Encoder*.

Status Display	Description

Status Display	Description
encoder error (BOOT)	The MPEG-2 encoder on the TS Input Port could not be booted. This could happen if there is no encoder connected, if there is a problem with the cable between encoder and MidiMux or if the encoder is defective.
encoder error (...)	The MPEG-2 encoder on the TS input port was started but an error occured during configuration. The abbreviations in the round brackets indicate what part of counfiguration failed. Possible values are VID, AUD, BR and PID.
encoder running	The MPEG-2 encoder on the TS input port is running.

4.8 Output Status

```
OUT: generate clock (50000 kBit/s)
```

This status line tells you about the status of the TS Output Port.

Status Display	Description
external clock	The TS output port is configured to accept a TS clock from an external device for TS data output.
generate clock (... kBit/s)	The TS output port is configured to generate TS clock for TS data output. The TS clock rate is set to transmit the specified amount of data.
Incompatible HW:... SW...	The device connected to the TS output port was recognized, but its firmware is incompatible with the current MidiMux firmware. Try to update both components to their latest firmware versions.
MiniMod V... detected	The MiniMod connected to the TS output port was recognized and can now be controlled from the MidiMux. A MiniMod Settings menu appears and is be accessible from the MidiMux main menu. The MidiMux output port and the MiniMod input port are automatically configured to ensure smooth data flow.

4.9 MiniMod Status

```
MiniMod: ON-AIR
```

This status line shows the global status of the MiniMod connected to the MidiMux' TS output port. See the MiniMod Firmware Manual[7] for a list of possible status messages and their descriptions.

4.10 PSI Status

```
Basic PSI Generator Active
```

This line shows the status of the MidiMux' built-in table generator.

Status Display	Description
PSI Generator disabled	The MidiMux' PSI Generator was disabled. The MidiMux will not generate any PSI or SI tables.
Basic PSI Generator active	The MidiMux' Basic PSI Generator is active. The MidiMux will generate PAT, SDT, NIT and PMTs for the connected MPEG-2 encoders.
Custom PSI/Filter active	The MidiMux' Extended PSI Generator is active and a custom tableset and/or PID filter was uploaded and is now active.
Custom PSI/Filter incompatible	The custom tableset / PID filter you have uploaded is incompatible with this MidiMux' firmware. Please use the latest version of the maintech Mux Configurator (see http://www.maintech.de/en/support/information/) to generate the .mbn-File and update the MidiMux firmware to the latest version.

continued on next page...

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[7]   http://www.maintech.de/fileadmin/Downloads/MiniModUsersGuide.pdf

Status Display	Description
Custom PSI/Filter empty	The MidiMux' Extended PSI Generator is active but no custom tableset and/or PID filter was uploaded. Use the maintech Mux Configurator to set up a custom table set and/or PID filter. Export this configuration as a .mbn file and upload this file to the MidiMux.
Custom PSI/Filter error (...)	The MidiMux' Extended PSI Generator is active and an error occured while executing the custom table set or filter program. Please ask for support.

5 Status Codes

Possible status codes that are reported by the MidiMux on its frontpanel:

Status Display	Description
`booting`	The MidiMux firmware is booting and initializing the hardware. This state is reported only for a short time during powerup.
`INx: loading...`	The MidiMux is uploading firmware to an MPEG encoder connected to a TS input port. This state is reported for a short time during powerup and after changing the TS input mode to *MPEG Encoder*.
`FPGA boot error`	Loading the FPGA failed. This status probably indicates a hardware failure. Please ask for support.
`INx: encoder err`	The TS input mode of TS input port x is set to encoder, but a MPEG encoder was not detected or an error occurred while starting the encoder. Please make sure that your encoder is connected properly or try a different encoder if you suspect a hardware problem.
`INx: tuner error`	The TS input mode of TS input port x is set to tuner, but a tuner was not detected or an error occurred while configuring the tuner. Please make sure that your tuner is connected properly or try a different tuner if you suspect a hardware problem.
`INx: not locked`	The TS input mode is set to tuner, a tuner was detected, but is not locked to a signal. Check if your tuner settings are correct and make sure that the tuner gets a good signal.
`running`	The MidiMux is working.
`<unknown>`	The MidiMux is in an unknown state. This indicates a severe hardware or software error. Power-cycle your MidiMux and, if the problem persists, ask for support.

6 MiniMod Remote Control

The MidiMux is capable of controlling a MiniMod connected to the MidiMux' TS output port. This means that you are able to control all of the MiniMod's modulation settings from the MidiMux' RS232 serial port or display/keypad.

To make the MiniMod Remote Control feature work, you need to perform the following steps:

1. Make sure that MiniMod and MidiMux are connected with a Type 1, 1X or 2 cable. We recommend using a Type 2 cable. A Type 3 cable will not work.[8]

2. Make sure that the MiniMod's TS input port is configured to *raw TS*. The settings for clock direction and clock edge do not matter – they will be set to the right values automatically.

3. Make sure that your MiniMod has at least Firmware Version 54.40. Contact us if your hardware has older firmware.

When everything worked well, the menu item *Output Settings* in the MidiMux main menu will be replaced by *MiniMod Settings*. You will also see a MiniMod status line in the MidiMux' verbose status report.

All settings you change in the *MiniMod Settings* menu are stored on the MiniMod immediately. So if you disconnect MidiMux and MiniMod, the MiniMod will remember those settings. If you connect a different MiniMod to the MidiMux, you need to check those settings as the MidiMux will always load them from the MiniMod.

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[8] For information about the different cable types, see the maintech cable guide:
http://www.maintech.de/fileadmin/Datasheets/Cable-Guide_v1_en-1.pdf