Lost Audio GmbH

&

Sumatronic AG

M-DAB-100

DAB+ Tuner Modul

suitable for

ReVox M100/M51

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DAB+ Tuner

DAB and DAB+ is the new generation of broadcasting technologies in which the radio signal is transmitted completely digitally. Even with difficult reception, you can hear your favourite stations without any noise.

The M-DAB-100 has been designed with sophisticated filter technologies to be largely resistant to any interference that occurs in today's everyday life. This means you can listen to the radio without interference, even when reception is difficult.

The tuner receives DAB and DAB+ in frequency band III from 174 - 240 MHz. Programming is fully automatic; the stations are automatically recognised, stored and given the correct name. Up to 250 stations can be stored.

The tuner uses an analogue input from your stereo system, factory-set to the AUX1 input. Since these AUX inputs are multi-room capable, the M-DAB-100 is also multi-room capable.

The high-precision time also contained in the radio signal can be used for automatic time correction of the Multiroom module (MRT-2 and MRT-3).

Enjoy the new way of listening to the radio.

The M-DAB-100 can be used for the ReVox M100, but also for the ReVox M51 (Mk1 and Mk2).

Installation

The module is equipped with sensitive electronics, never open the metal box, it does not contain any components that require maintenance.

Basically, the M systems are modular, which means that each function has an address, also called slot. There are mechanical slots, but also virtual ones. The M-DAB-100 is connected externally to your stereo system, therefore it gets a virtual address or slot. The assignment of these addresses happens automatically, but can be changed manually.

Connect the M-DAB-100 to the M-LINK bus with the supplied flat cable. Both M-LINK sockets of the M100 as well as both sockets on the M-DAB-100 are identical and can be used as IN and as OUT. The M51 also has an M-LINK socket. M-LINK is used for communication with your stereo system. Likewise, the analog audio signal must be connected to a free AUX input of your stereo system using the supplied RCA cable. Preferably use AUX1.

Before you connect the M-DAB-100 to your stereo system, disconnect the 230V power from your stereo system. Now connect the two cables

as described and then reconnect the 230V power again.

Now you can switch on your stereo system again. The M-DAB-100 is preconfigured to take over the AUX1 input of the M100 as well as the M51 completely. This is therefore no longer visible, instead "DAB+" appears at the sources. If you want to use AUX2 or AUX3 on the M51, the module must be configured on setup page 5. Likewise, the slot code (address) of an M51 may have to be reconfigured. The M-DAB-100 occupies slot 1 for the M100 and slot 7 for the M51. With an M51, it is recommended to set the lowest possible free slot so that the source "DAB+" is visible on the first page of the sources.
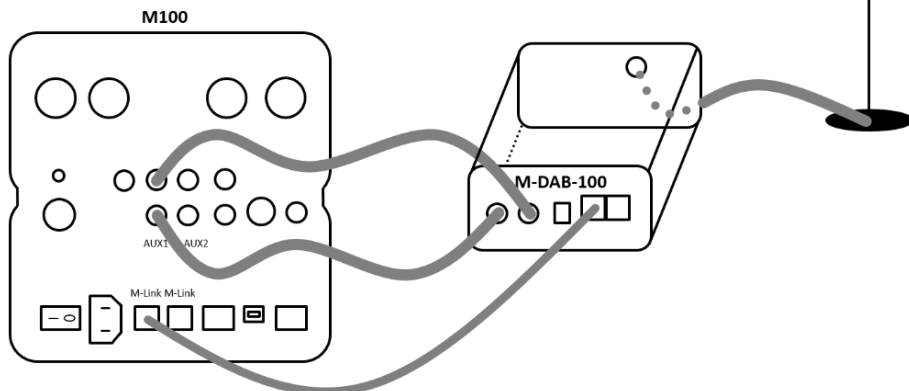
Find out whether you are using an active or passive antenna for DAB+ reception. If you use an active antenna, which must be supplied with 5V voltage, this can be supplied by the DAB+ module up to a max. current of approx. 30mA. If you want to switch on this power supply, do this on the Settings page 4.

To connect the antenna, use the F-connector, which is designed for 50 and 75 Ohm antennas. The F-connector of your antenna must be put on and the screw must be tightened by hand (WITHOUT tools).

If you receive DAB+Cable via your cable network, you can convert this signal with the sumaDAB DAB+Cable adapter into normal DAB+ signals and receive them with the DAB module. In this case, the antenna is unnecessary.

Cable reception is usually simple and trouble-free.

Currently, UPC (Switzerland) and its partners offer DAB+Cable with around 90 radio stations on their cable networks.
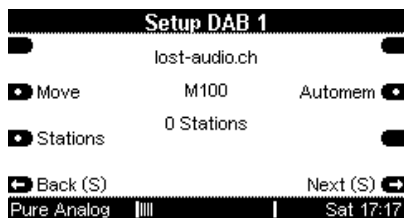
Store stations

When the DAB+ tuner is delivered, no stations are stored on it. The stereo system has to switched on with the POWER button. Now select the new source, which is recognizable as "DAB+". The tuner will independently switch to setup mode because no stations are stored yet. If you want to switch to this mode later with stored stations, press for two seconds (M100: TIMER / M51: SETUP) and then select SOURCE with the soft key.

Now the setup menu 1 appears in the display. The detected system type and the number of stations are shown in the center.

The setup menu contains five pages. You are currently on page one. Only the first page of the setup menu is needed to store the stations. However, if you are using an active antenna, briefly switch to setup page 4, switch on the power and return to page 1. Do not forget to save this setting first by pressing "Back (S)" for a long time (2 seconds).

Setup DAB 1		
◼	lost-audio.ch	◼
◼ Move	M100	Automem ◼
◼ Stations	0 Stations	◼
◼ Back (S)		Next (S) ◼
Pure Analog ‖‖‖		Sat 17:17

Now you can execute the automatic station search by pressing the AUTOMEM soft key for two seconds. The tuner does not have a manual

tuning function, as this is not necessary with DAB+. DAB+ works differently from FM, where a single radio station is transmitted on each frequency. With DAB+, multiple radio stations are bundled into one package (called an ensemble) and transmitted on a single broadcast frequency. Therefore, direct tuning and thus the entering of a station is not possible. Since each radio station has a predefined name, it is not necessary to name radio stations yourself.

The AUTOMEM function searches all 40 channels in band III and finds all available radio stations. It also finds stations that cannot be played because reception is too weak. These can be deleted later. A manual tuning is therefore not necessary.

The channels are automatically counted from 0 to 40. The display is updated at fixed intervals. This can therefore mean that not every single channel is displayed. However, all channels are always searched, even if they are not displayed once.
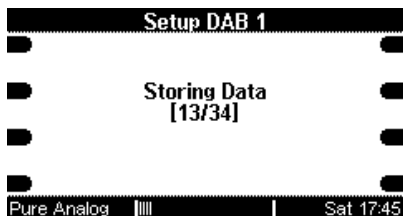
At the end, all found radio stations are stored. It is also checked whether these are not merely data services. The latter are not radio stations, ergo do not transmit music and are therefore automatically deleted during the saving process. Therefore, it can happen that more stations are displayed during the saving process than are saved at the end.

In the following pictures you can see the steps of the auto-tuning process one after the other.
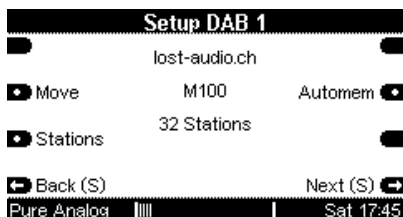
All 40 channels are searched

Setup DAB 1

Searching...
Channel: 10
7C 192.352 MHz

Pure Analog ||||| | Sat 17:45

All found radio stations are saved.

Setup DAB 1

Storing Data
[13/34]

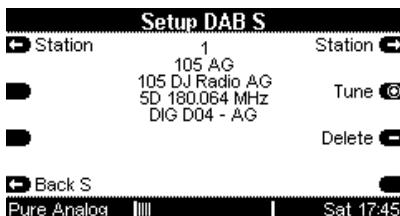Pure Analog ||||| | Sat 17:45

At the end, the number of stored radio stations is displayed. Here 2 data services were filtered out, therefore the number was reduced from 34 to 32.

Setup DAB 1

lost-audio.ch

Move   M100   Automem

32 Stations

Stations

Back (S)   Next (S)
Pure Analog ||||| | Sat 17:45

Browse, listen and delete stations

To browse through all the stored radio stations, you can now press the "STATIONS" soft key.

Setup DAB S

Station   Station
          1
        105 AG
    105 DJ Radio AG
    5D 180.064 MHz   Tune
      DIG D04 - AG

                              Delete

Back S
Pure Analog ||||| | Sat 17:45

Each station is displayed individually with all its data:

1. Memory location of the radio station
2. Short display name of the radio station
3. Long display name of the radio station. Depending on the length, it may not be possible to show the full name on the display. (Reason: The display was designed for FM station names and not for the long DAB+ names.)
4. Channel and frequency on which the whole station package is transmitted.
5. Each station package also has a name, this is the so-called ensemble name.

With the upper two arrow soft keys you can navigate through all radio stations.

A short press on the TUNE soft key lets you listen to the station directly. If the reception is too weak, it may

not be possible to play it. In difficult reception conditions, it may take a long time for the tuner to adjust to the reception. In this case, wait at least twenty seconds.

Often the station can still be heard perfectly afterwards.

If the name or other data of the station are not completely displayed, the reason for this is probably the incorrect reading of the data due to reception problems. By pressing the TUNE key for at least 2 seconds, the corresponding data is read in again and stored.

If you want to delete the radio station, press the DELETE soft key for two seconds. The deletion process is visible immediately, but is not saved until you exit this station menu by pressing BACK S. (S stands for the English verb "store").

Move station

The stations are basically stored alphabetically. However, you can also define your own sequence. To do this, press the MOVE soft key.

Now you are in the menu where you can move the radio stations according to your wishes and thus arrange them.
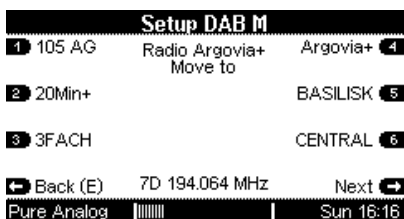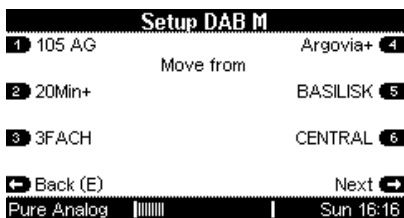
As soon as the display shows "Move from", select the radio station you want to move: Use the bottom two buttons to navigate forward and backward. When you have found the radio station you want to move,
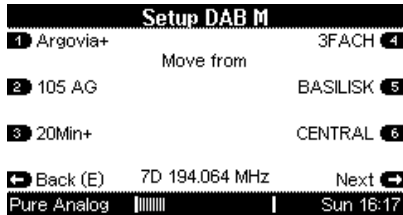
select it by briefly pressing the corresponding soft key.

Now select the position where you want to put the radio station before and select it by briefly pressing the corresponding soft key. The shift is immediately visible. You can now repeat this process as often as you like until everything is ranked as you would like it to be.

If a station has to be moved to the very end, select the last radio station as the destination. Now the moved station is in the second last position. Now move the last station to the second last position and the originally desired radio station is at the end.

See now the moving process in pictures. The radio station "Argovia+" is moved from position 4 to position 1.

```
┌─────────────────────────────────┐
│         Setup DAB M             │
│ 1 Argovia+              3FACH 4  │
│            Move from            │
│ 2 105 AG              BASILISK 5 │
│                                 │
│ 3 20Min+              CENTRAL 6  │
│                                 │
│ ← Back (E)  7D 194.064 MHz Next →│
│ Pure Analog |||||||||   |  Sun 16:17│
└─────────────────────────────────┘
```

```
┌─────────────────────────────────┐
│         DAB+ Tuner              │
│ 1 Argovia+  Radio Argovia+  3FACH 4 │
│             CAMELPHAT -          │
│ 2 105 AG        01    BASILISK 5 │
│                                 │
│ 3 20Min+              CENTRAL 6  │
│           72kb S Q.100          │
│ ← Back    7D 194.064 MHz   Next →│
│ Pure Analog |||||||||   |  Sun 16:21│
└─────────────────────────────────┘
```
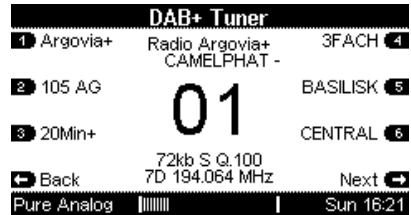
The new sequence is not saved until you now press BACK (E) for two seconds. The E in brackets means "Exit", and causes that with a long press on the key all is saved.

Listen to stations

As soon as you select the DAB+ source on your M100 / M51, the last selected radio station is played again.

To do this, press the SOURCE button on the M100 / M51 as usual and then select the DAB+ source with the soft key.

```
┌─────────────────────────────────┐
│         DAB+ Tuner              │
│ 49 SRF1 AG+  SRF 1 AG SO+  SRF1 GR+ ■ │
│             PREPARING TO         │
│ 50 SRF1 BE+      49     SRF1 LU+ ■ │
│                                 │
│ ■ SRF1 BS+            SRF1 SG+ ■ │
│           64kb S Q.85           │
│ ← Back   12C 227.360 MHz  Next →│
│ Pure Analog |||||||||   |  Sun 16:22│
└─────────────────────────────────┘
```

As you know from the FM tuner, you can navigate through all stations with the lower two buttons and, as soon as you have found your desired radio station, select it with the corresponding soft button.

If the station does not play immediately, please wait at least 20 seconds. In difficult reception conditions, it can take a long time for the tuner to adjust to the reception. Often the station can still be heard perfectly afterwards.

The key number is always displayed in the margin. However, the display of the M100 / M51 is only designed up to 50. As a result, stations that exceed the maximum mark of 50 cannot be displayed numerically.

The large display of the radio station number on the M100 / M51 is designed up to 99. As a result, stations that exceed the maximum mark of 99 are displayed with a smaller, centered number.

It can also happen that very long radio station names are occasionally cut off, because the display is not designed for such long names.

The information from top to bottom has the following meanings:

1. Long radio station name

2. Radio text, scrolls from right to the left
3. Station number as big number (above 99 as small number).
4. Data rate of the radio station, Mono/Stereo/JointStereo/Dual and the reception quality from Q.0 to Q.100
5. Channel and frequency of the station package of this radio station.

Reception quality in words:

0-20: Music plays only fragments
21-30: Music plays with interruptions
31-70: Music can be played, data can usually be reconstructed. Small transmission interruptions are likely.
71-99: Music plays nearly normally
100: Bit error rate is 0. Perfect

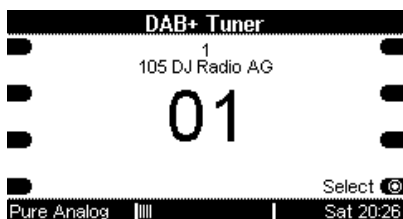The display on the wall remote control in side rooms is very similar to the main display:

1. Station number
2. Long radio station name
3. Radiotext scrolls from right tot he left
4. Data rate of the radio station, Mono/Stereo/JointStereo/Dual and the reception quality from Q.0 to Q.100

Tuning by quickselection

Since many stations are received on DAB+, searching via scrolling quickly becomes a test of patience. Therefore, there is still a quick selection function. To do this, press the NEXT soft key for two seconds:

Now you are in the radio station quick selection mode. The currently playing radio station is still displayed in the center. The number and name of the radio station to be selected are displayed above. Turn the large rotary knob in the center on the M51 or slide your finger over the touch slider on the M100 and search for your radio station. Once you have found the desired one, press the SELECT soft key and the radio station is selected.

```
        DAB+ Tuner
              1
        105 DJ Radio AG

         01

                         Select ◉
Pure Analog  |||||          |  Sat 20:26
```
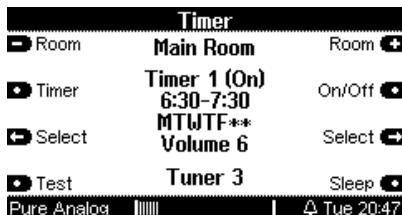
Timer programming

Timer programming on the M100 and M51 is basically taken over by the Multiroom or the 1+1 module and is only available if one of these modules is installed. The two modules basically do not know a DAB+ tuner, as it has not been prepared for this. Nevertheless, you can use the DAB+ tuner for waking up without any problems.

It is important that you do the "Remote Settings" (explained further back in the manual). This way you can send timer commands to the "Tuner", which are then directed to the DAB+ tuner.

If you now want to set the timer for DAB+, select the "Tuner" as destination and the station number. Here in the example, the station number 3 is used to wake up. At 6:30 a.m., the DAB+ tuner and station number 3 will now be used to wake you up.

```
              Timer
▭ Room      Main Room        Room ▣

▭ Timer    Timer 1 (On)      On/Off ▣
            6:30-7:30
             MTWTF**
▭ Select    Volume 6         Select ▣

▭ Test      Tuner 3          Sleep ▣
Pure Analog  |||||||      |  ♧ Tue 20:47
```

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Settings

Various settings can be made on the DAB+ tuner. You can access these if you have DAB+ active as a source and press the (M100: TIMER / M51: SETUP) key for two seconds and then briefly press the SOURCE soft key.

The setup menu has five pages, the first of them you already know from the first setup. To access the other ones, press the left or right arrow key.

All changes are definitely saved only after pressing one or the other arrow key for two seconds. Otherwise, the corresponding setting will be active only until the next time the power is turned off and disconnected.

Setup page 2

Volume

You can use the upper two soft keys to adjust the basic volume of the DAB+ tuner so that it matches all other sources perfectly. This setting applies to all radio stations together.
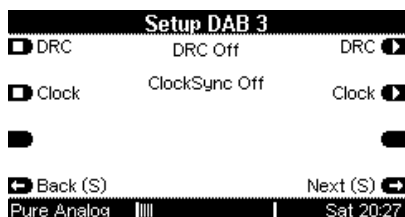
Equalizer

With the two second uppermost soft keys you can select one of the pre-defined equalizer settings that apply to all radio stations.

• disable (switched off)
• Bass boost
• Jazz
• Live
• Vocal
• Acoustic

Headroom

With the headroom setting, experts can set the headroom for the tuner. Usually, no changes are needed here, and 0 should usually fit. However, if radio stations are transmitted unusually loud, the expert can readjust this setting here.

Setup page 3

```
          Setup DAB 3
🔲 DRC           DRC Off            DRC ◀▶
🔲 Clock       ClockSync Off        Clock ◀▶
▬                                         ◀
🔲 Back (S)                      Next (S) ➡
Pure Analog   ▐▌▌▌              ▌   Sat 20:27
```
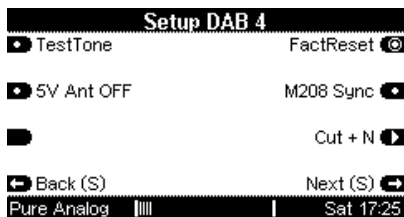
DRC

DRC means Dynamic Range Control and is only used by a few radio stations. This setting affects the dynamic range of the broadcast radio signal.

Clock synchronization

A very precise time signal is supplied with the DAB+ transmission. When you switch on this function, the DAB+ tuner compares the clock of the Multiroom module with the DAB+ time every time it is switched on and adjusts it if it deviates from the DAB time more than 10 seconds.

The time adjustment only works with Multiroom modules of the newer generation MRT-2 and MRT-3 or the 1+1 Module for the M100. These modules have RJ45 sockets each and must have the software version 2.0 or above. With the MRT-1 with the 4 SUB-D connectors the time can not be adjusted.

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Setup page 4

```
          Setup DAB 4
□ TestTone              FactReset ◉
□ 5V Ant OFF            M208 Sync □
■                          Cut + N □
□ Back (S)                 Next (S) □
Pure Analog  ‖‖‖        ‖      Sat 17:25
```

TestTone

You can use this key to select between different test tones. Each press of the button takes you to the next variant.

- Noise on both channels
- Sine 1kHz left channel
- Sine 1kHz right channel
- Sine 1kHz both channels
- Test signals switched off

Antenna power

If you use an active antenna which needs a 5V supply, it can be supplied directly from the DAB+ tuner with the required voltage of 5V and maximum approx. 30mA. By pressing the button "5V Ant OFF" you can switch between supply on or supply off. The currently active mode is displayed on the key. If "5V Ant ON" is displayed on the key, the power supply is switched on.

Cut +

Many stations mark their radio station names with a + at the end, for example SRF3+. In this way, radio stations encoded with DAB+ can be distinguished from those with DAB.

Since almost all stations have a + at the end of the name, this information is rather useless than helpful. With this option, the + at the end of the name can be suppressed. This option also has an effect when synchronizing with the M208.
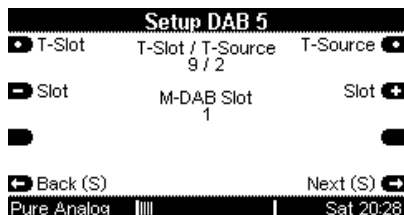
"Cut + Y" = switched on

"Cut + N" = switched off

FactoryReset

To reprogram the DAB+ tuner from scratch, the entire memory contents can be erased. To do this, press the FactoryReset button for two seconds. After this reset, the entire system should be completely switched off and switched on again.

M208 Sync

The **synchronization** of the M208 with the DAB+ tuner is explained in the next but one section.

Setup page 5

```
            Setup DAB 5
■ T-Slot      T-Slot / T-Source    T-Source ◧
                   9 / 2
◧ Slot          M-DAB Slot         Slot ◧
                     1
■                                        ■
◧ Back (S)                       Next (S) ◧
Pure Analog  ||||               |   Sat 20:28
```

Since the M-DAB-100 is connected externally to your stereo system, there are 3 configurations that can be preset automatically and adjusted manually if you whish.

T stands for Target, which is the analog input used for the tuner. An analog input source, for example AUX1, has a slot number and a source number. This is what T-Slot and T-Source stand for. In the M100 these numbers are fixed:

M100: AUX1 → 9 / 2 (default)
M100: AUX2 → 9 / 3

With the M51, it depends on which physical slot the analog I/O module is located. If it is in the usual slot 6, the settings are as follows:
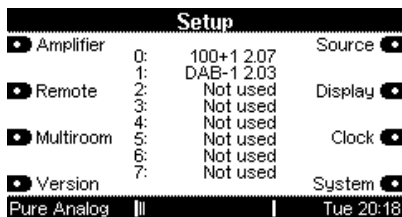
M51: AUX1 → 6 / 0 (default)
M51: AUX2 → 6 / 1
M51: AUX3 → 6 / 2

The DAB+ tuner itself must also have a slot number. Since it is connected externally, this can be configured and set to a free slot. By default, this is set to 1 for the M100 and 7 for the M51. You should not change this for the M100, slot 1 is optimal. For the M51 you may change this to the lowest free slot on the M51. Look at the device from the back, and count the first free slot from right to left. This has the advantage that the source "DAB+" is displayed further forward in the source overview.

All occupied slots can also be viewed in the version overview. To do this, press for two seconds (M100: TIMER / M51: SETUP) and then select VERSION with the soft key. Pressing VERSION again shows slots 8-15.

```
                 Setup
■ Amplifier   0:   100+1 2.07      Source ◧
              1:   DAB-1 2.03
■ Remote      2:   Not used       Display ◧
              3:   Not used
              4:   Not used
■ Multiroom   5:   Not used        Clock ◧
              6:   Not used
              7:   Not used
■ Version                         System ◧
Pure Analog  |||              |    Tue 20:18
```

T-Slot

Slot in which the analog I/O module is located. With the M100, it is fixed 9.

T-Source

Source number of the analog input used.
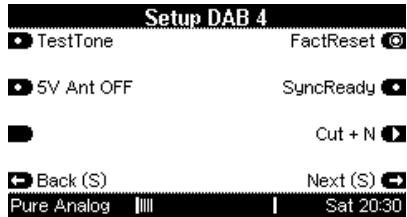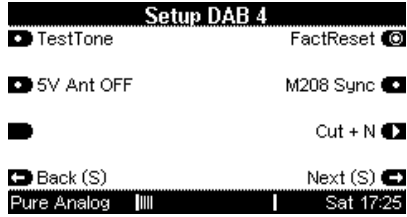
M-DAB-Slot

Slot number of the M-DAB-100 DAB+ tuner.
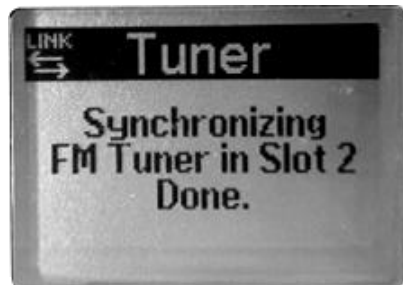
Synchronization M208

The M208 remote control can transfer the FM tuner's station list to itself with the M208-Link adapter and is limited to a maximum of 63 radio stations.

The DAB+ tuner also offers this function, but it requires an option that must be switched on briefly. During synchronization, there should not be an FM tuner in the M51 for this! This does not matter with the M100.

First connect the remote control via USB cable to the M208 link adapter. This must now be connected to the M-Link of the M100/M51 with the corresponding cable. Now go back to the setup menu on the M100/M51 and select the fourth page, where you will find "M208 Sync". Now prepare the M208 by setting it to Tuner Mode (press Tuner). Then click on SETUP on the remote control as usual and put the cursor on the sync function, but wait with OK. Now press the soft key "M208 Sync" briefly. Now you have about 10 seconds to trigger the synchronization on the M208. Attention: Only as long as SyncReady is on this soft key, synchronization is possible. After that you have to press it again.

The M208 indicates whether the transmission was successful or not. However, it always thinks that it has communicated with an FM tuner.
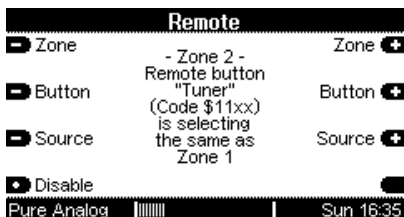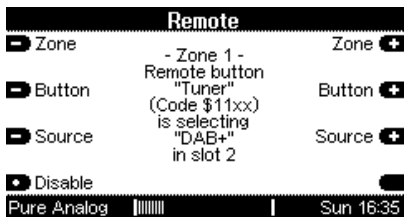

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Remote settings

In order for the commands from the infrared remote controls, wall remote controls and the Timer to the DAB+ tuner to work, this must be configured on your M100 or M51. (Otherwise the commands will go to a possible FM tuner).

To do this, press the SETUP button for two seconds and then select the REMOTE soft button. Now first select the remote button TUNER in zone 1. The two soft keys in the second row from the top let you change the "button". Then use the third row to select the source and set it to DAB+. Now be sure to press the STORE soft key to save this setting.

ATTENTION: For the Mk1 version of the M51, this configuration is only available in general, not per zone individually.
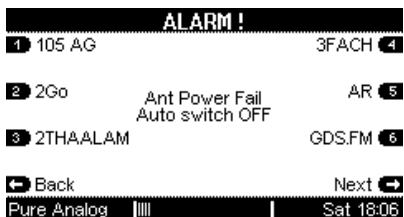
If you have additional zones in use, you must also carry out this for the additional zones if desired. The additional zones can be explicitly set to DAB+ for the tuner button, or to "the same as Zone 1". Again, please do not forget to save the settings for each zone.

Only after this setting is it possible to switch to the DAB+ tuner with the Tuner button on the remote control or the wall remote control.

Active antenna

If too much current is demanded from the antenna supply due to a defect in the antenna or a short circuit, this is detected and the power supply is automatically deactivated. An alarm message appears in the display. As soon as you have corrected the error, the power supply can be reactivated in the setup menu on page 4.

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Troubleshooting/Tips

No reception with active antenna

My M100/M51 cannot receive radio stations with an active DAB antenna.

Solution

An active antenna has an integrated signal amplifier. This requires power in order to function. Active antennas that require 5V and a maximum of 30mA can be powered directly by the DAB+ tuner module by enabling this in the setup menu on page 4. Check in Setup Menu 4 to see if this is turned on. Also check that your antenna is rated for 5V max 30mA.

Power supply

The M-DAB-100 tuner draws its power from the M-LINK bus. No separate power supply is necessary. However, if too many devices are operated on the M-LINK, the M-DAB-100 can be operated with a separate power supply to relieve the M-LINK bus. Use a 24V DC power supply with at least 500mA and a DC round plug 5.5mm/2.1mm. The center pin carries the positive voltage. Since this power supply is usually not used, none is included.

Technical data

Frequency range:	174 - 240 MHz
Frequency band:	III
Channels:	5A – 13F
Sensitivity:	-99dBm
Broadcast type:	DAB and DAB+
Antenna connection:	F-Socket for 50 or 75 Ohm
Phantom power antenna:	5V ±10%, max. 30mA

Warranty

The warranty is 24 months from the date of purchase.

Your contact person in case of service is first your specialist dealer.

If he cannot help you, please contact the sales partner.

Support & Questions

On the Internet site www.M-DAB.ch you will find many helpful answers and contact details.

Manual version 1.1
suitable for firmware: 2.04
suitable for hardware: 1.4.1 & 1.4
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General

When disposing the board, the local laws on the disposal of electronics must be observed.

Declaration of conformity:

Please find here:
www.M-DAB.ch