HAEFER

User Manual DVM 70

Digital Voice Master

preliminary version



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1 General description

The Digital Voice Master DVM 70 is a universal voice announcement device with two internal speakers, which can be used to announce floor information and special information. In between announcements, background music can be played.

The overall announcement duration is 15 h.

All announcements, music and settings are saved on a microSD card.

The DVM 70 has 14 inputs and their allocation is configurable. Further configuration options cover whether an announcement should occur in a loop, whether a gong should sound before the announcement, which announcement should interrupt another announcement, etc.

Text, music and settings can all be easily selected using DVM-Configurator, a PC program.

Several settings can also be configured using dip switches on the device itself, with the operator being guided through the menus by announcements.

Announcement texts can be recorded directly into the device using the auxiliary module Micro DVM 70 (microphone amplifier); this also allows the announcement volume to be adjusted to the background noise floor.

Separate external speakers can be connected and allow a high-quality stereo playback.

2 Illustration





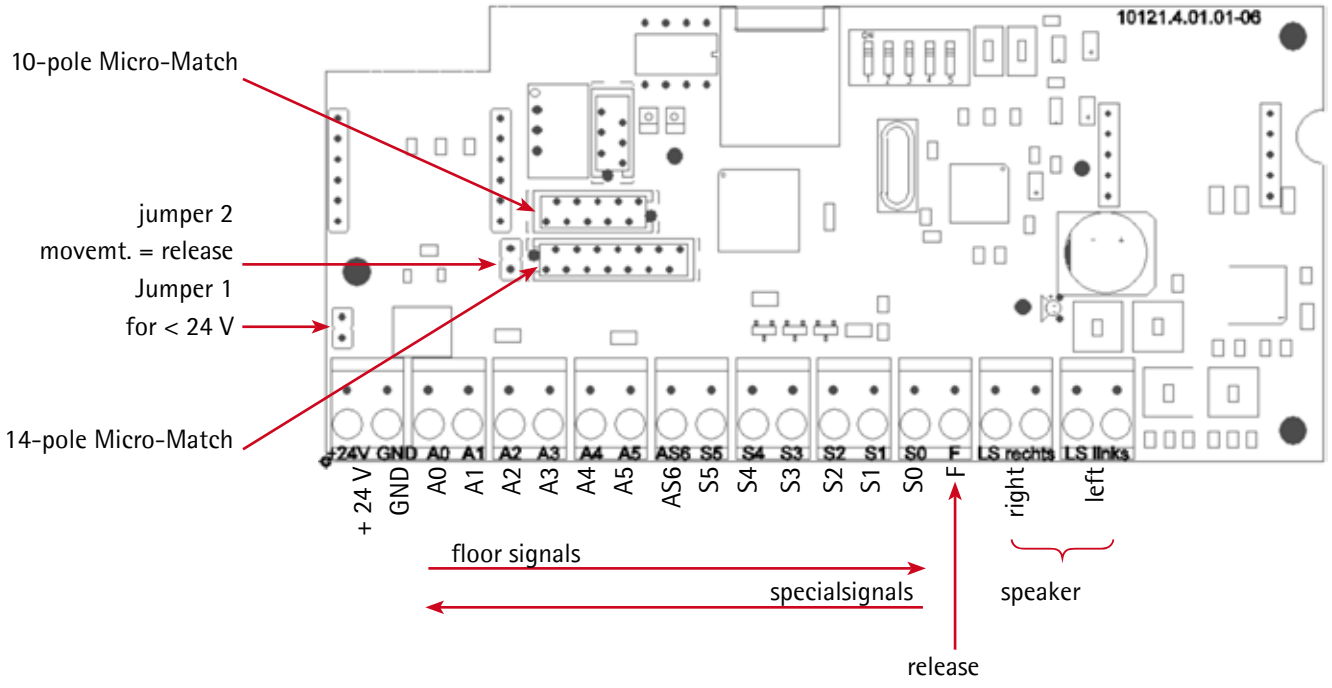
3 Configuration

There are two configuration options:

- The DVM 70 can be configured by SCHAEFER according to a customer's requirements.
- You can configure the DVM 70 yourself. For this, you will need the PC program, "DVM-Configurator", a Windows PC and a standard microSD card recording device.

Many configuration settings can be modified on the device without additional tools.

4 Ports



Ports

The DVM 70 can be connected via terminals or 2 plug connectors.

The following tables show the allocation of the plug connectors:

14-pole Micro-Match	Signal	Description
1	+	positive supply voltage
2	A0	lowest floor signal
3	A1	see 4.2 and 4.3
4	A2	
5	A3	
6	A4	
7	-	negative supply voltage
8	F	releases signal
9	S0	overload
10	S3	full load (pin 9 ... 25)
11	S5	loading time
12	S1	out of sevice (pin 20 ... 25)
13	S2	firefighters´travel
14	S4	special travel (pin 8 ... 25)

If the function "recording with key switch" has not been selected, the DVM 70 can be connected using the SCHAEFER MFD 99 modules via this plug connector.

10-pole Micro-Match	Signal	Description
1	+	positive supply voltage
2	A0	lowest floor signal
3	A1	see 4.2 and 4.3
4	A2	
5	A3	
6	A4	
7	A5	
8	AS6	
9	-	negative supply voltage
10	travel	with Jumper J2, this signal can be connected to the release

Via this plug connector, The DVM 70 can be connected with the SCHAEFER MFD 99 module via this plug connector.

- DMD (all versions)
- Uni-Wandler (univerdal converter)
- Encoder (all versions)
- Impuls converter
- Signal converter

The meaning of the signals A0 ... A5, AS6, S5... S0 changes depending on the number of floors, the number of special texts, the signal coding and the use of a key switch for the recording function. The current terminal allocation is displayed in „DVM-Configurator".

4.1 Firm ports

Regardless of the configuration, the connecting terminals are always same for the supply voltage (+24 V, GND), release signal (F) and speakers (left, right). The device's internal speakers are connected to the speaker terminals in a delivery condition.

Operating voltage:
If the DVM 70 is to be operated at a voltage lower than 24 V, then the jumper J1 should be plugged in.

4.2 Floor signals

For the floor signals, the connecting terminals are allocated starting with A0 and through A1, A2, etc.
The number of terminals required depends on the type of coding and the number of floors.

- For triggering "1 out of n", as many terminals are required as there are special signals (max. 13).
- For triggering "Dual" or "Gray", the following table shows how many special signals there can be for a given number of terminals.

4.3 Special signals

As a rule the terminals for the special signals are allocated starting with S0 and through S1, S2, etc. (exception: see the next section). Here, the highest prioritised signal is at S0. The announcement at S0 – if configured – can interrupt all the other announcements. Accordingly, S1 can interrupt the signals S2, S3, etc.

- For triggering "1 out of n", as many terminals are required as there are floors (max. 13).
- For triggering "Dual" or "Gray", the following table shows how many floors there can be for a given number of terminals.

Required terminals for Dual or Gray	Maximum number of floors if the lowest floor = coding 0000	Maximum number of floors if the lowest floor = coding 0001	Maximum number of special signals
1	2	1	1
2	4	3	3
3	8	7	7
4	16	15	15
5	32	31	31
6	64	63	63
7	128	127	-
8	256	255	-

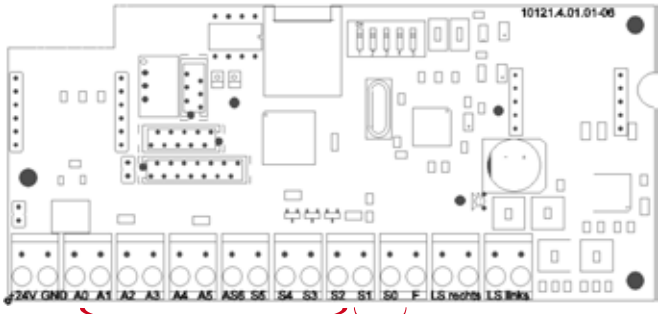
4.4 Key switch connection

If you are using the Micro DVM 70 (microphone amplifier) extension module, you can record announcements yourself and control the recording function with a key switch. Key switch connection is as follows:

- Terminal S0 – key switch left
- Terminal S1 – key switch right

Common pole of the key switch at + with common cathode and at – with common anode.
In this case, the allocation of the special signals shifts. The terminals are allocated starting with S2 and through S3, S4, etc.

4.5 Examples

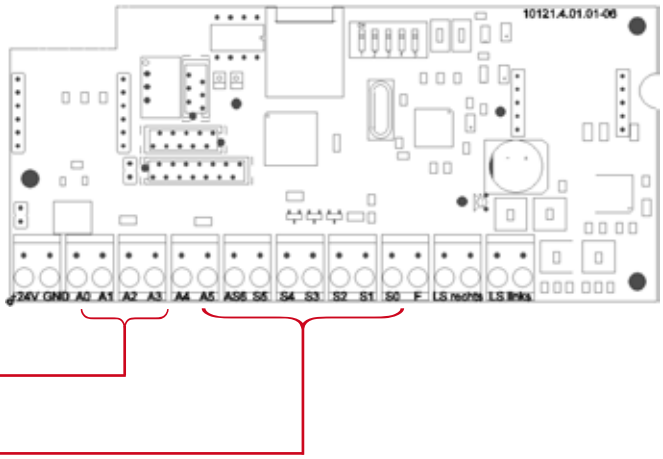


Example 1

- 11 floors, triggering 1 out of n
- 2 special signals triggering 1 out of n
- No key switch for recording function
- The floor signals are connected at A0 ... S2 with the lowest floor to A0.
- The special signals are connected to S0 and S1.
- The announcement S0 can interrupt S1.

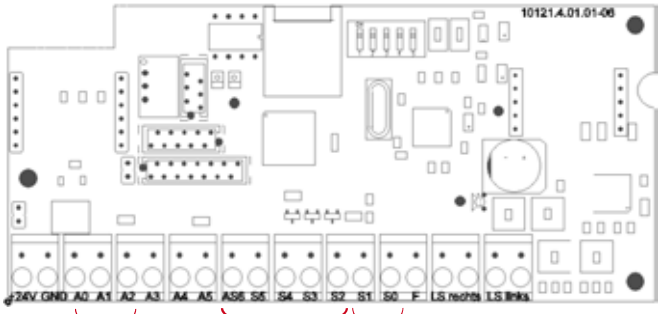
Ports

Example 2



- 8 floors, triggering Dual, lowest floor coding = 1
- 8 special signals, triggering 1 out of n
- No key switch for recording function.
- 4 terminals needed for floor signals: A0 ... A3.
- The special signals are connected to S0 ... AS6.
- Terminal A4 remains vacant.

Example 3



- 8 floors, triggering Dual, lowest floor coding = 0
- 5 special signals triggering 1 out of n
- 3 terminals needed for floor signals: A0 ... A2.
- Die Sondersignale werden an S2 ... AS6 angeschlossen.
- key switch is connected to S0 and S1.
- Terminals A3, A4 and A5 remain vacant.

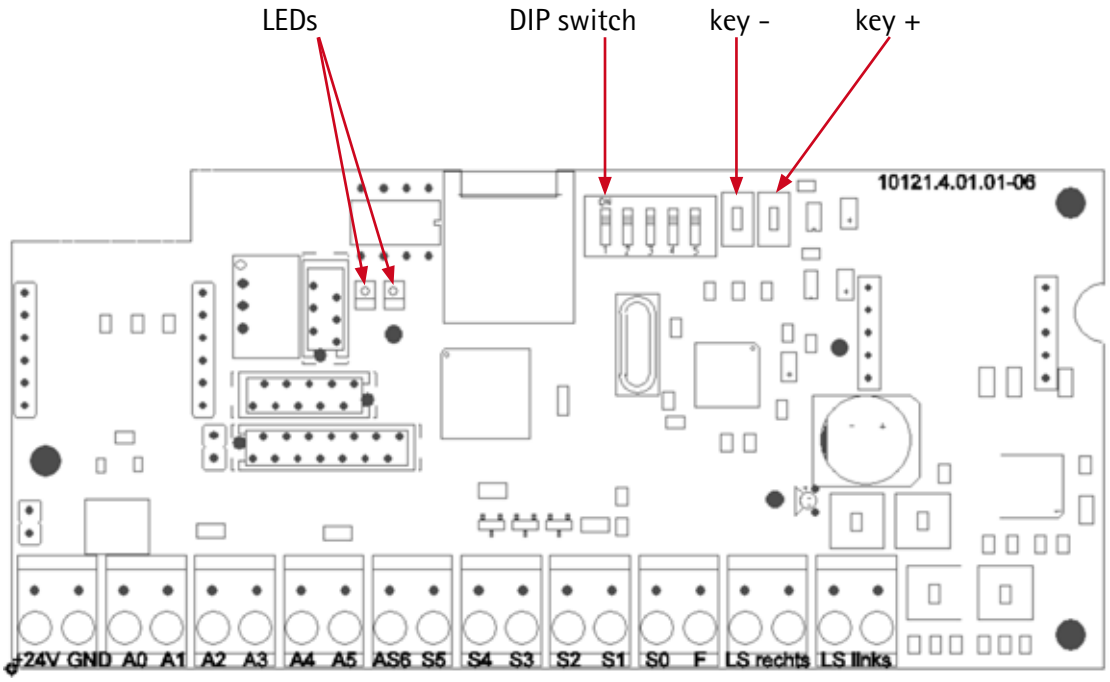
5 Settings

On the DVM 70 itself, it is possible to use the keys and/or DIP switches for different settings.

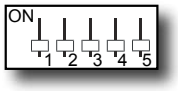
The DIP switch is used to select which value is to be changed (e. g. coding of the floor signals); the current setting is indicated by the LEDs. In addition, the current setting can be announced using the minus key (left). The plus key (right) allows you to go through all possible options for this value. The current value is announced in each case.

When resetting the DIP switches to the home position, the altered values are stored on the microSD card and are retained in the event of a power cut.

When setting volumes and the response threshold of the volume adjustment, the keys have a slightly different meaning: The minus key (left) is used to decrease these values, the plus key (right) to increase them.

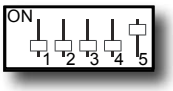


For normal operation, all DIP switches must be OFF.



5.1 Test mode

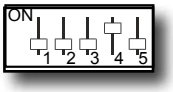
The test mode is used for testing the MP3 player, the amplifier and the speakers.
Output occurs even without the microSD card and/or if there is a card defect.
Output is independent of the volume values set, with a power output of approx. 0.5 VA.



right key → 1 kHz right
Length 1 s
LED: red

left key → 1 kHz left
Lenght 1 s
LED: green

5.2 Reference potential



common anode
The common pole of the inputs is at + (anode).
inputs active = current flow = low floor

LED: green

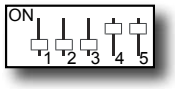
right key

common cathode
The common pole of the inputs is at – (cathode).
inputs active = current flow = high floor

LED: red

right key

5.3 Release signal for floor announcements



Release signal is used
The floor announcement occurs if a valid floor is present and the release signal becomes active.
The floor announcement also occurs if the release signal is active and the floor signals change to become a valid value.
LED: green

right key

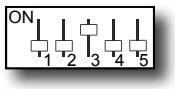
Release signal is not used
The floor announcement occurs if the floor signals change to become a valid value.

LED: red

right key

Special announcements are always made independently of the release signal.

5.4 Coding floor signals



1 out of n
LED: green

right key

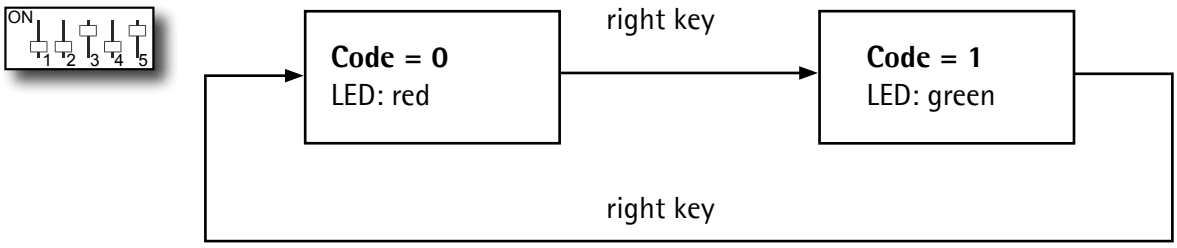
Dual
LED: red + green

right key

Gray
LED: red

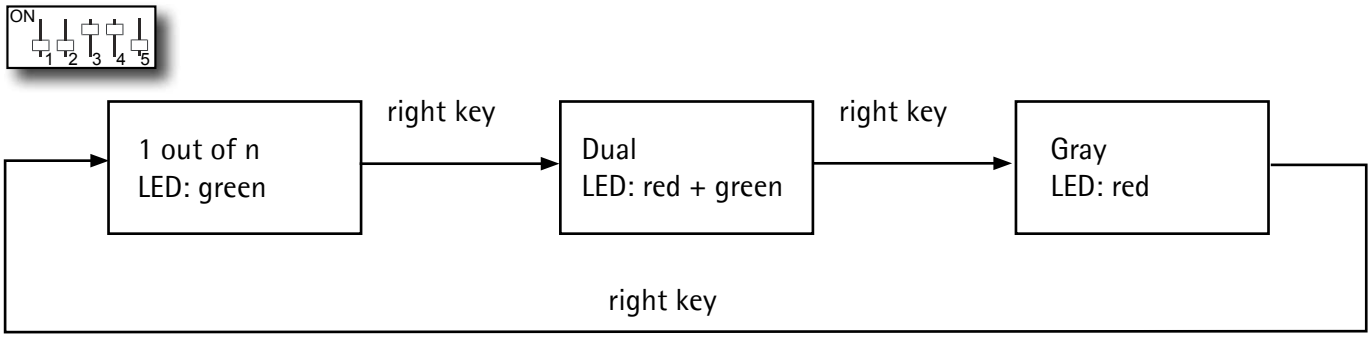
right key

5.5 Code for lowest floor

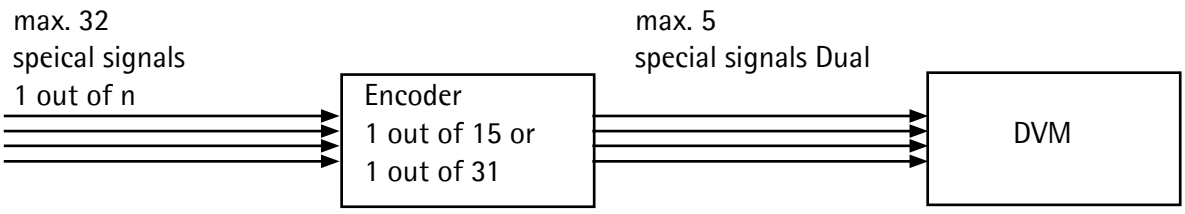


This setting is only used for triggering Dual or Gray.

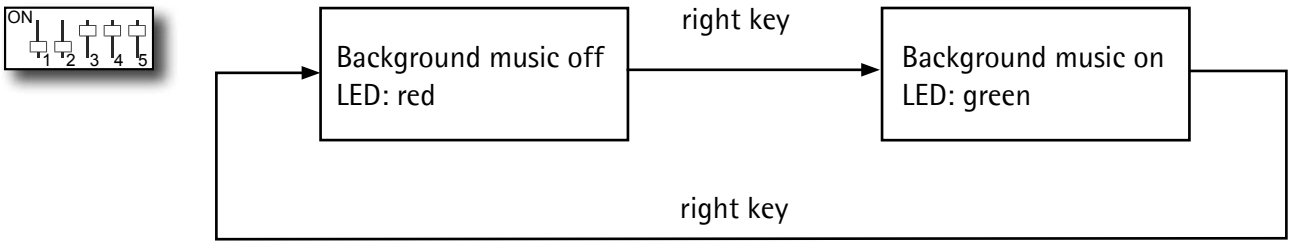
5.6 Coding Special Signals



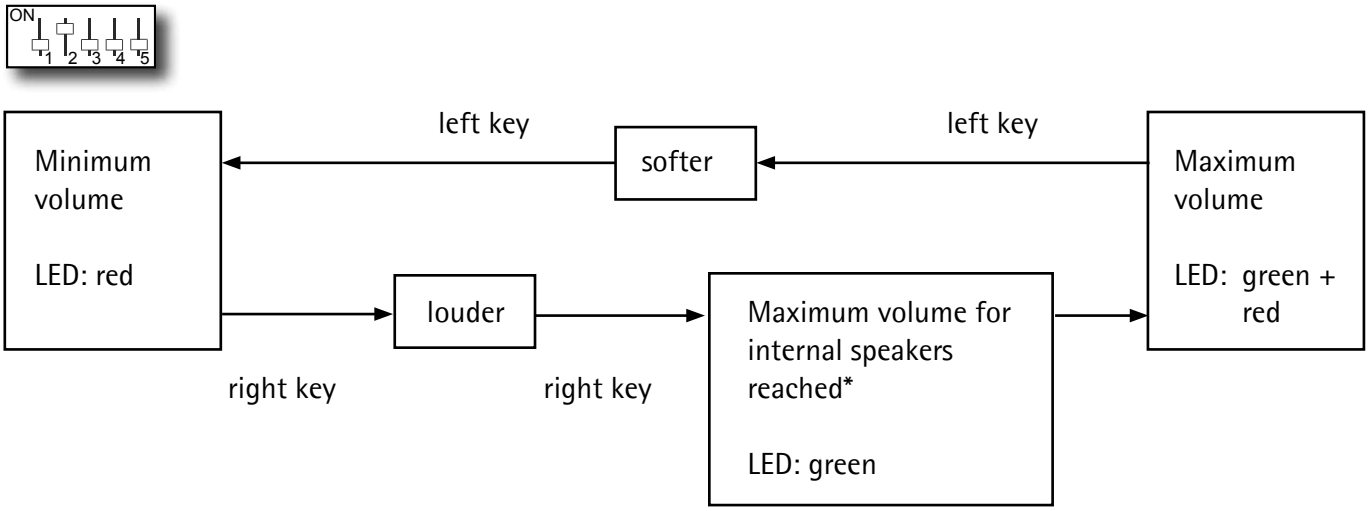
The special signals are usually present as 1 out of n. If the number of terminals is not sufficient for the current usage, an encoder that converts the signals from 1 out of n to Dual coding, can be added upstream for the special signals.



5.7 Background music

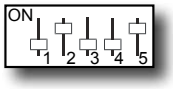


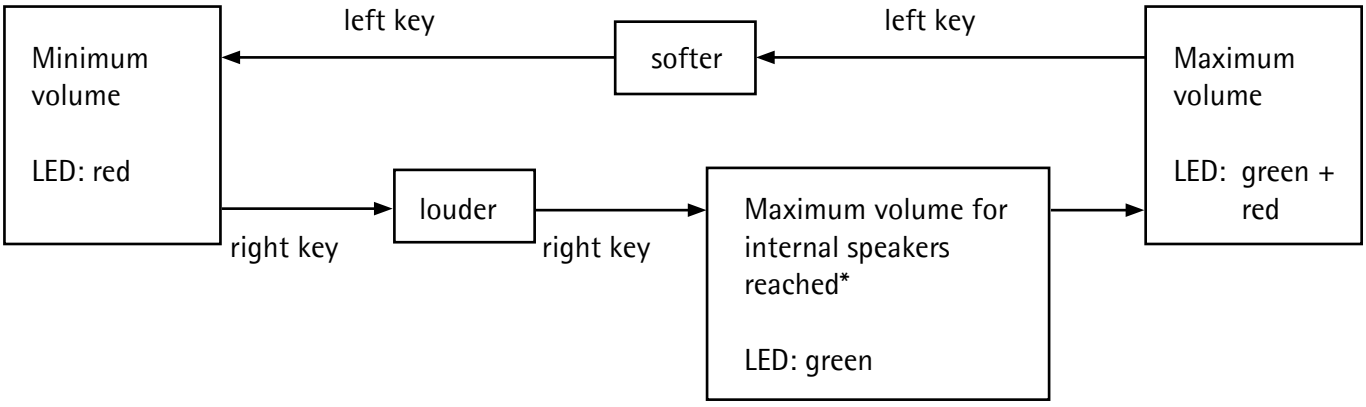
5.8 Volume for announcements



* If operating the DVM 70 using the internal speakers, pay attention to the warning Maximum volume for internal speakers reached, else you risk damaging the speakers.
If you are operating the DVM 70 using external speakers, you may ignore this warning.

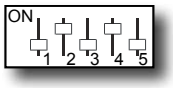
5.9 Volume for background music

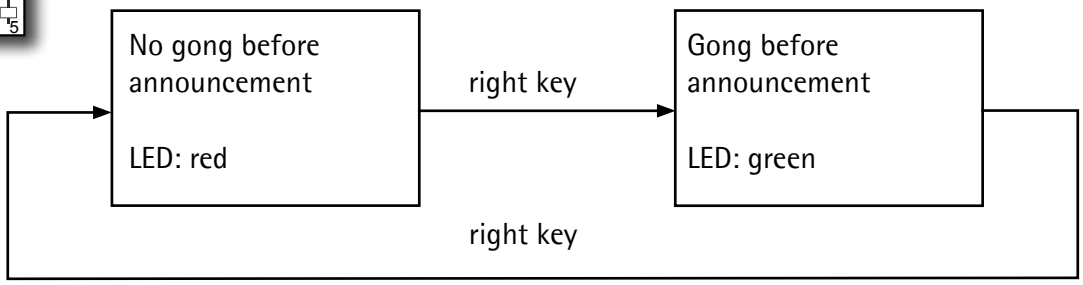




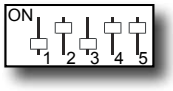
* see note in section 5.8

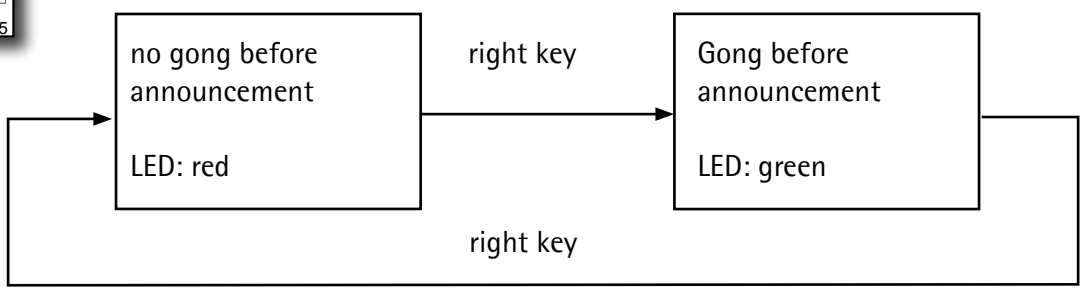
5.10 Gong before floor announcements



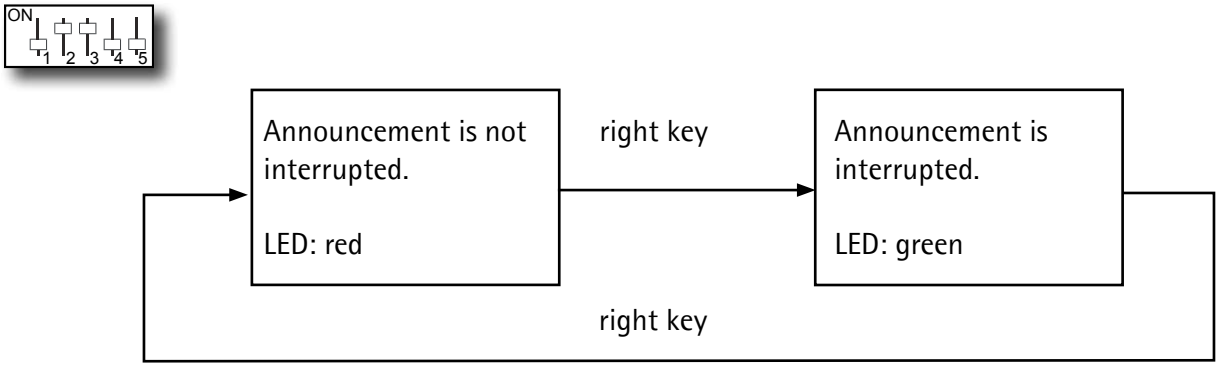


5.11 Gong before special announcements

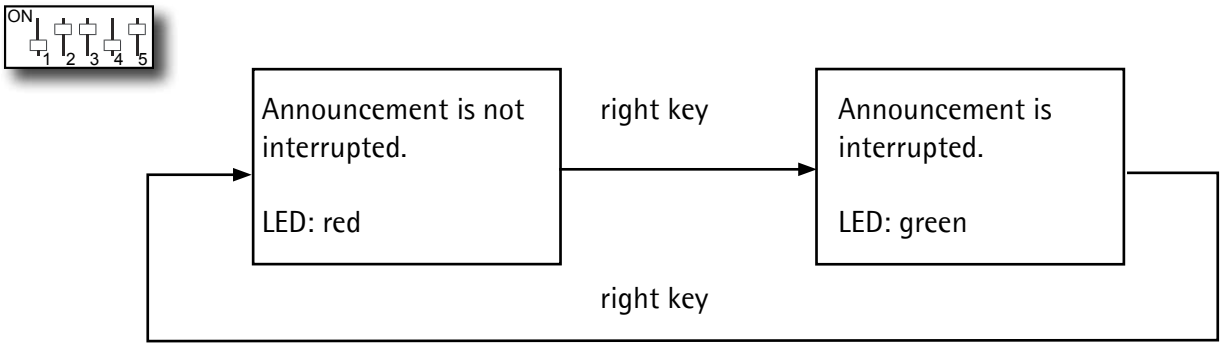




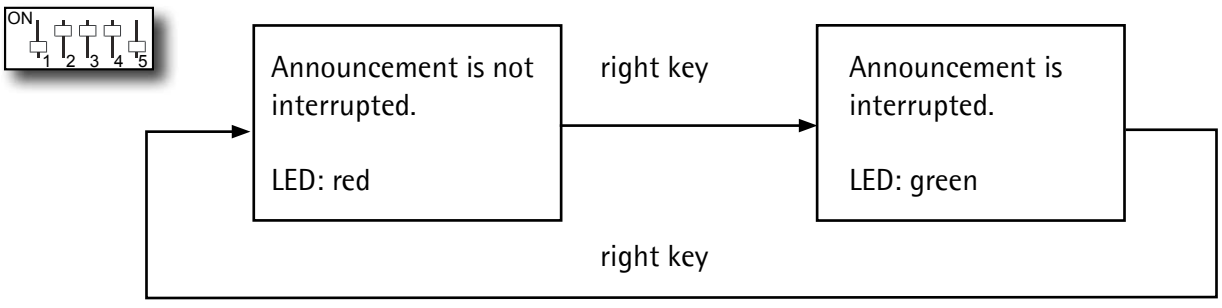
5.12 Floor announcement interrupted by a special announcement



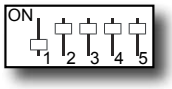
5.13 Special announcement interrupted by a higher-priority special announcement

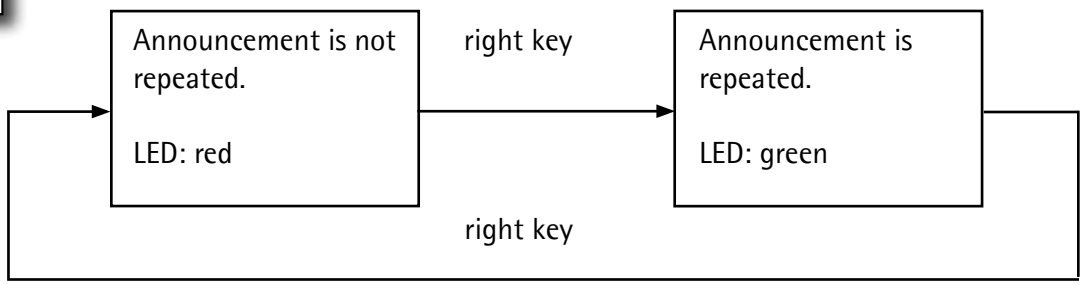


5.14 Floor announcement interrupted by a different floor announcement



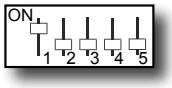
5.15 Repetition of a floor announcement after the special signal



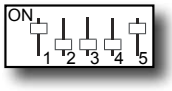


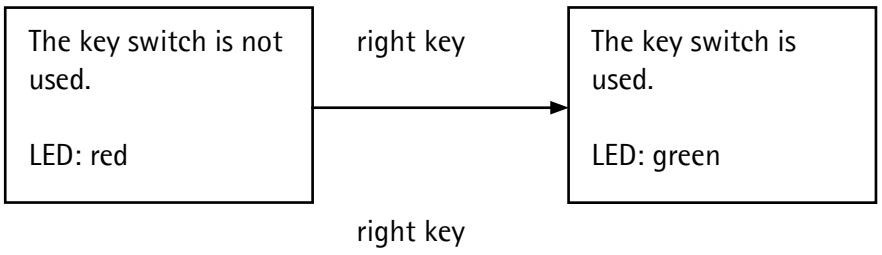
5.16 Recording function

This function launches the recording mode for a spoken text. It is available only if the Micro DVM 70 auxiliary module group has been attached. For operation instructions, see section 6.2.2.

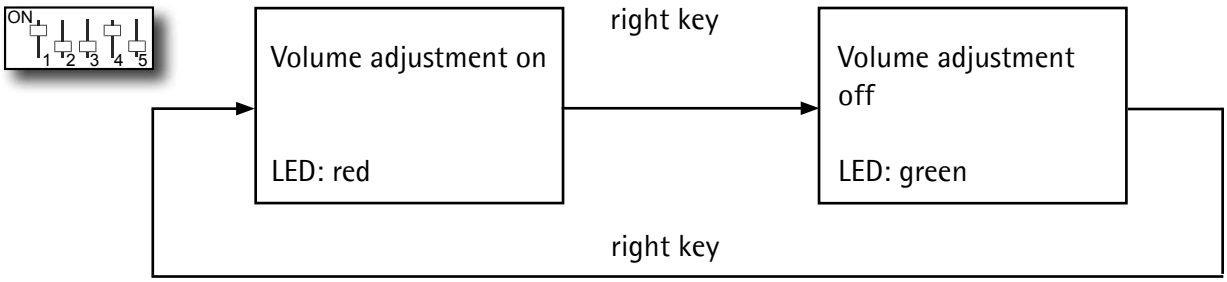


5.17 Key switch for recording





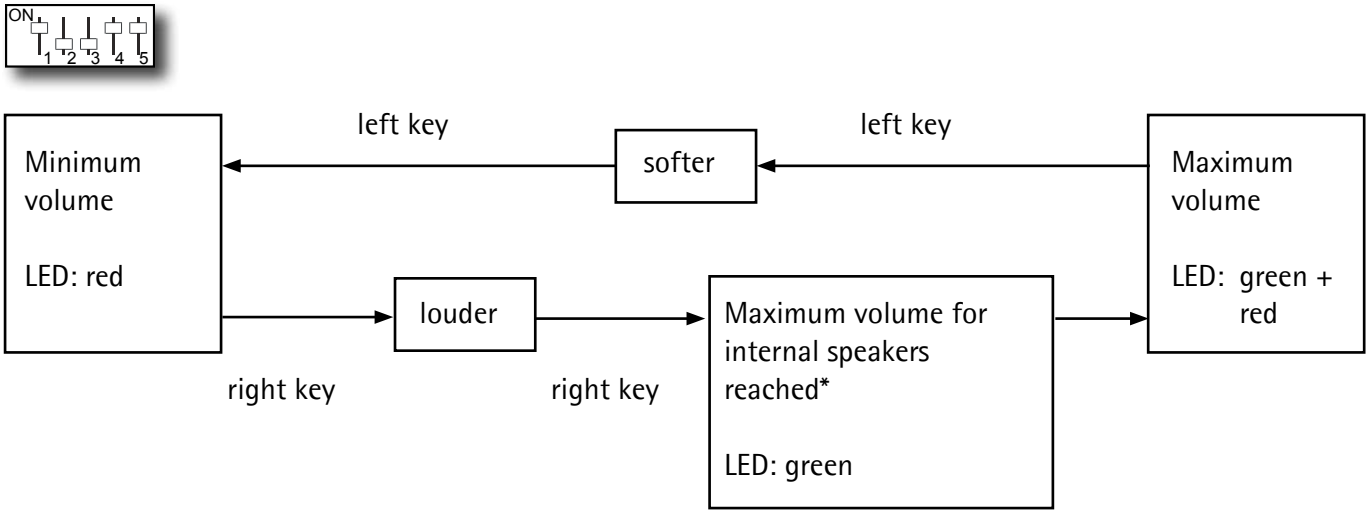
5.18 Volume adjustment



When turning on the volume adjustment, the announcement volume (see section 5.8) is limited to the maximum volume.
To set the volume adjustment, see section 6.2.4.

5.19 Maximum volume

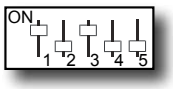
Maximum volume is only used if the volume adjustment is switched on.
This value is then used for the announcements when there is a very high floor of background noise.

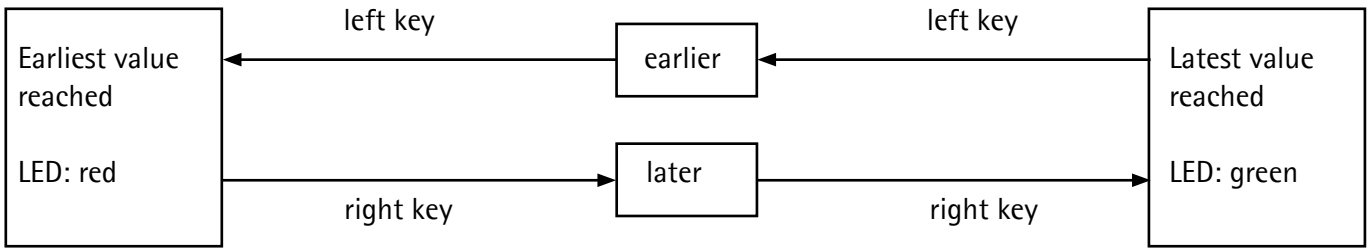


* see note in section 5.8

5.20 Response threshold

The response threshold is used when the volume adjustment is switched on.
If this value is set very early (low), the volume adjustment is triggered early on, i. e. at low floors of background noise. In this case, a relatively loud announcement is made with a medium floor of background noise.
If this value is set very late (high), the volume adjustment is also triggered late, i.e. at high floors of background noise. In this case, a relatively loud announcement is made with a medium floor of background noise.





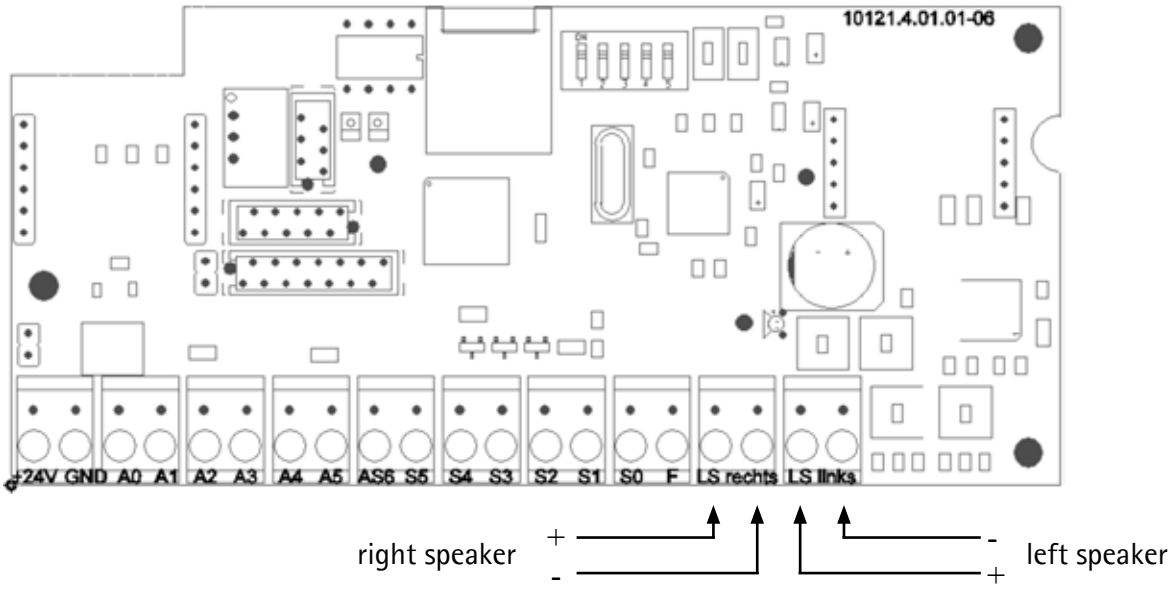
To set the volume adjustment, see section 6.2.4

6 Upgrades - additional functions

6.1 External speaker connection

For special volume and sound requirements, for stereo playback, or to achieve spray water protection and protection against vandalism, it is possible to connect separate external speakers (with an impedance of > 8 ohm).
In this case, please first remove the internal speaker connections from the speaker terminals.

Warning!
Do not allow the connection wires of the internal loudspeakers to hang loosely and do not put them into the housing. The bare ends could cause short circuits on the circuit board. Isolate the connection wires and attach them to the outside of the housing with tape.



When connecting stereo-loudspeakers, pay particular attention to the correct polarity.

SCHAEFER offers the following speakers:

Speaker 70
for louder volumes and improved playback quality

Speaker 60 VP
for spray water and vandalism protection
to be installed behind closed surfaces (without openings)

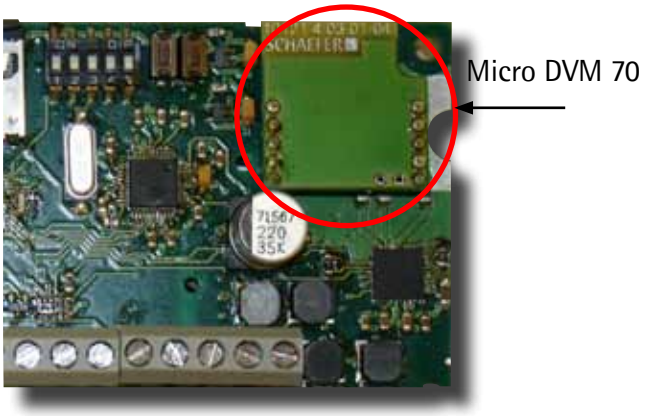
6.2 **Micro DVM 70** microphone amplifier

If you wish to record announcements yourself or wish to use the volume adjustment function, you will require the Micro DVM 70 module.

6.2.1 Installation

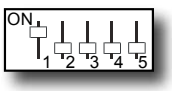
If you have purchased the Micro DVM 70 separately, please follow these installation instructions:

1. Switch off the supply voltage.
2. Attach the module to the DVM 70 as shown.
3. Turn the supply voltage back on.



6.2.2 Internal recording function

You can turn on the recording function by positioning the DIP switches as follows:



Use the plus key (on the right) to select the announcement text to be replaced. Scroll through all announcements until you reach the desired one. Floor announcements, from lowest to the highest priority, are given first, followed by special announcements, this time in order of highest priority.

Press the minus key (on the left) to record. Hold down the key whilst recording. Once you release the key, the recording is played back.
You can now record again by pressing the minus key. Use the plus button to select another announcement text to be replaced or end the recording function by returning the DIP switches to their normal positions.

Note: The recording volume is automatically regulated. There is approximately a one second delay after you have pressed the minus key before recording begins.

6.2.3 Recording function with key switch

For this function, the Micro DVM 70 module must be attached and the configuration „use of a key switch for recording" must be activated (see section 5.17).

Now select the announcement text to be replaced by briefly turning the key switch to the right. Starting from the lowest floor announcement, cycle through all the announcements until you reach the desired announcement.
Turn the key switch to the left to record. Keep it in this position whilst recording. On you release it, the recording is played back.

To record again, turn the key switch once more to the left. Turning it to the right enables you to select an other announcement text to be replaced; alternatively, you can quit the recording function by returning the key switch to its normal position.

Note: Whilst in the recording function and for 10 s afterwards, all the other signals are blocked. There are no other announcements and no background music is played.

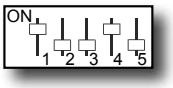
6.2.4 Volume control

This function allows the announcement volume to be adjusted to the background noise floor. This function can be used on a train platform, for example, to increase the announcement volume whenever a train arrives or departs. Music playback volume is not affected by this.

Setting volume control

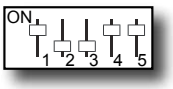
To set volume control, please do the following:

1. First, turn off the volume control

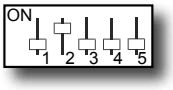


LED red

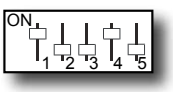
2. Set the maximum volume to the desired floor. This will be the announcement volume when there is a high floor of background noise.



3. Set the minimum announcement volume to the desired floor. This will be the announcement volume when there is a low floor of background music

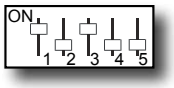


4. Now, turn on the volume control.

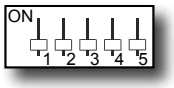


LED green

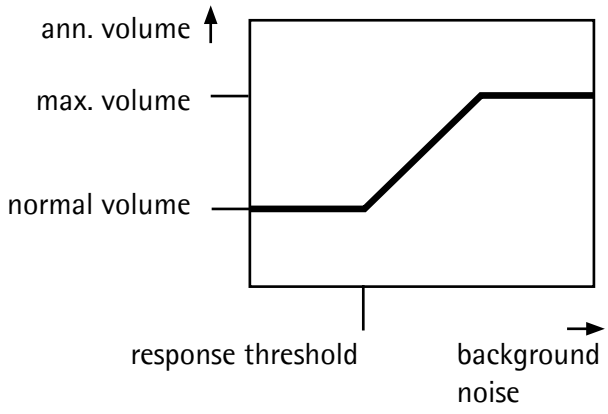
5. Set the response threshold to the desired value. This is the floor of background noise, at which the volume control kicks in. The sooner the volume control sets in, the louder the announcement will be at medium volume and vice versa.



6. Switch the DIP switches to normal mode.



Functioning of volume control



Background noise measurement

If background music has been turned on, the background noise is measured once with a time delay after the music has faded out.

What to do in the event of faulty setting

First of all, switch off the volume control and check the settings of the maximum volume and the normal volume as described above. Switch the volume control back on.

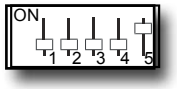
If the announcement is too loud at low and medium floors of background noise, the response threshold must be set later. If the announcement is too quiet at high and medium floors of background noise, the response threshold must be set earlier.

7 Fault finding

If the DVM 70 does not function correctly, please try the following:

7.1 Checking the MP3 players, amplifiers and speakers

Set the DIP switches to test mode.



Turn on the supply voltage.
Press the minus key (left key). From the left speaker, a 1 kHz signal should be audible for 1 s. At the same time, the green LED will come on.
Press the plus key (right key). From the right speaker, a 1 kHz signal should be audible for 1 s. At the same time, the red LED will come on.

If one or both tones cannot to be heard, check the connection of the loudspeakers.
If the error continues, the device is defective.
If everything is in order, continue to use the device normally.

7.2 Checking the microSD card

Set the DIPs witches to normal mode.

If the red LED is now flashing, there is a microSD card fault.
Check if a microSD card is present in the card holder and is locked in place.
If the error persists, reload the microSD card data using the DVM-Configurator program.

If none of the LEDs comes on but no text is announced when the DIP switches are moved, reload the microSD card data using the DVM-Configurator program.

If none of the LEDs comes on and text is announced when the DIP switches are moved, the DVM is operating in basic mode normally. To set the desired function, please check the settings (see section 5).

8 Characteristics

8.1 Digital Voice Master DVM 70

Supply voltage	12 V ... 30 V DC, smoothed
Power consumption (typical)	20 mA (standby) 170 mA (at 24 V and 2 x 1 VA) 3 A (at 12 V and max. output)
Output rating (internal speakers)	2 x 0,5 VA sine
Output rating (external speakers)	2 x 1 VA sine 2 x 10 VA music (A power reduction will be caused trough higher temperatures)
Volume	80 dB (A) at 1 m distance
Temperature range	-20 °C ... 65 °C
Connection	clamp, 0.1 mm² ... 1.5 mm²
Data storage	microSD card
File formats	*.mp3 (up to 128 KBit/s), mono/stereo
Inputs	14 inputs, 12 V ... 30 V DC, 13 of these are freely configurable
Announcements	max. 255 floor and 64 special announcements max. announcement length total: 15 h for *.mp3 format max. announcement length per text: no limit
Dimensions	L x W x D (128 mm x 60 mm x 24 mm)
Fixing	3 welding studs

8.2 Microphone Amplifier Micro DVM 70

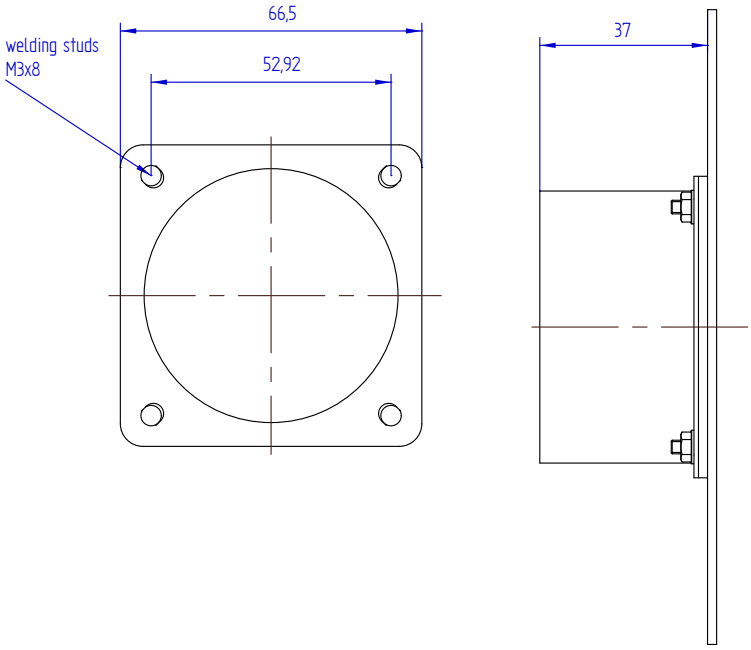
Module for volume adjustment and recording function

Dimensions	L x W x D (23.5 mm x 23 mm x 12 mm)
Fixing	Plug contacts on DVM 70

8.3 Speaker 70

Auxiliary speaker for higher output rating and improved playback quality

Impedance	8 ohm
Output	8 W sine
Dimensions	L x W x D (66.5 mm x 66.5 mm x 37 mm)
Fixing	4 welding studs



8.4 Structure-Borne Noise Converter Speaker VP 60 (vandalism-proof)

Structure-borne noise converter for installation behind closed surfaces for protection against spray water and vandalism

Impedance	8 ohm
Output	20 W music
Dimensions	L x W x D (58 mm x 58 mm x 21 mm)
Fixing	4 welding studs

