

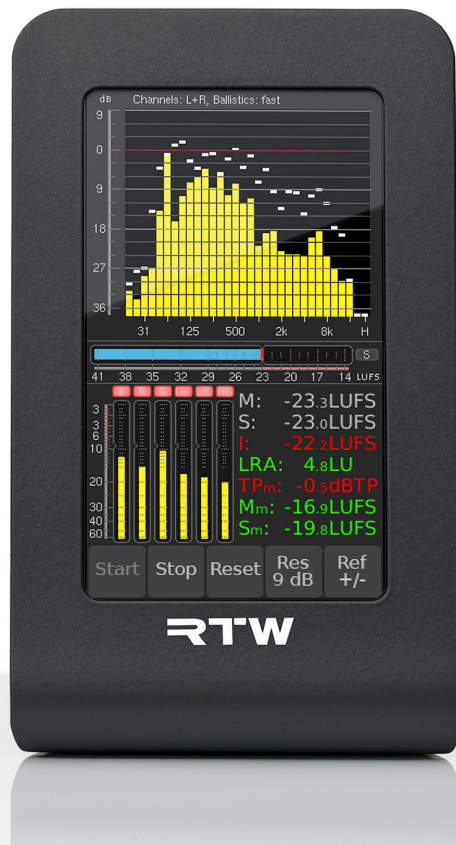
Data Sheet

MM3

MusicMeter

RTW

MM3 MusicMeter



Touch screen layout ▪ views selectable just by finger wipe ▪ Stereo inputs: analog, SPDIF, USB ▪ Surround audio via USB digital output ▪ Loudness according to all relevant standards ▪ PPM/True Peak or VU ▪ Chart ▪ RTA ▪ Audio Vectorscope

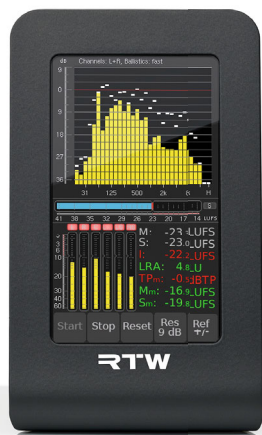
RTW's MM3 MusicMeter is a highly compact and innovative, easy-to-use product, giving music, voice, and multimedia producers everything they need for loudness and audio metering, including frequently used standard instruments and parameters in a high quality unit to meet the demands of a wide variety of applications. Beside the use as a standalone desktop unit including analog and digital audio interfaces, as well as USB audio, MM3 also provides the innovative USB hybrid mode. Stereo and Surround audio metering will be performed right from the DAW via RTW USB Connect plug-in without

the need for additional wiring or extensive signal routing. MM3 MusicMeter will process and visualize the information simultaneously to the monitoring of the audio signal via DAW's audio interface. The graphical user interface used in MM3 units is controlled simply by using your finger. Typical views with different instrument combinations for optimized reading can be selected just by a wipe. All commonly used parameters are set, just a few need to be adjusted by the user to meet individual requirements.

Hardware

MM3 MusicMeter

- Compact unit with full feature set for multifunctional audio measurements (analog, digital, USB audio)
- Table-top unit with display and external USB mains adapter
- 4.3" capacitive touch screen (272 x 480 pixel)
- Selectable views with different instrument combinations
- Analog 2-channel stereo input via unbal. RCA, adjustable from -22 dBu (61 mV) to +24 dBu (12.28 V)
- Digital 2-channel stereo in- and output via S/PDIF (RCA)
- Micro-USB connector for digital audio inputs (stereo, 5.1) and USB power supply (USB mains adapter or PC)
- Loudness metering acc. to EBU R128, ITU-R BS.1770-3/1771-1, ATSC A/85, ARIB, OP-59, AGCOM, or CALM Act
- Summing loudness bargraph (M, S, or I selectable)
- Numerical display (M, Mmax, S, Smax, I, LRA, TPmax values)
- Loudness measurement control via onscreen keys
- Loudness Chart instrument for displaying and analyzing the course of a loudness measurement over time
- PPM & True Peak measurement with standard scales
- Moving Coil instruments (PPM, VU)
- Real Time Analyzer (RTA) displaying the spectral distribution of an audio signal
- Audio Vectorscope (Lissajous display)
- 2-channel stereo downmix of USB surround audio signal to S/PDIF out connector
- USB hybrid function: Simultaneous monitoring and metering, and additional remote control of Start/Stop/Reset function with RTW USB Connect software



Software

Integrated Software Package

With the integrated software package, MM3 MusicMeter is fully equipped. It provides a wide range of RTW's approved loudness and audio metering tools to meet the demands of a wide variety of applications. Beside the signal processing and the control functions this software includes the following instruments:

TP/PPM Bargraph

PPM instrument displaying Peakmeter or TruePeak Meter bargraphs with analog or digital scales and numerical display.

MC - Moving Coil

Moving Coil instrument for the display of needle instruments for 2-channel Stereo with PPM display or VU display.

Loudness Bar

Loudness Sum instrument for displaying the summed loudness values M, S, or I of a loudness measurement acc. to EBU R128, ITU BS.1770-3/1771-1, ARIB, ATSC A/85, OP-59, AGCOM, CALM Act on a bargraph display.

Numeric Instrument

Loudness Num instrument for the numerical display of relevant values of a Loudness measurement: M, Mmax, S, Smax, I, LRA, TPmax.

Chart

Loudness Chart instrument for displaying and analyzing the course over time of a loudness measurement directly on the display.

VSC - Vectorscope

2-ch. Audio Vectorscope for displaying the phase relationship between the channels of a channel pair (Lissajous display).

RTA

Real Time Spectrum Analyzer instrument for displaying the spectral content of the input channels using 31 filter bands. Highpass filter for High Band (>20 kHz).

Keyboard

Selectable on-screen keys with defined functions for control of loudness measurement in multiple instruments.



Software (continued)

Optional Software

Optional software can be used to expand the fields of application for MM3 MusicMeter.

RTW USB Connect (SW50300)

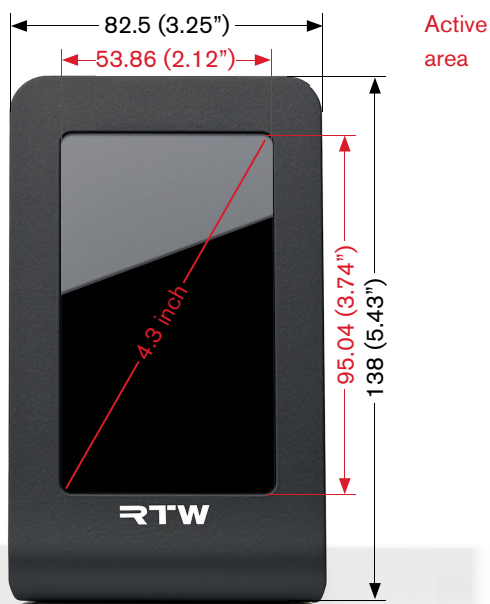
Available free of charge on our web site, the RTW USB Connect software enables a direct connection between a MM3 MusicMeter and a DAW environment as a plug-in. It offers the remote control within the DAW for start/stop/reset to the MM3 MusicMeter. With this software it is not necessary to define the MM3 as output device (USB hybrid function). RTW USB Connect can also be used as a stand-alone application for metering and monitoring, and for remote control for start/stop/reset to the MM3 MusicMeter.

- Monitoring and metering at the same time.
- Plug-in operation for a direct connection between DAW and MM3 MusicMeter via USB Connect.
- Direct access of Stereo or 5.1 audio signals from the DAW without dropping the audio interface.
- Remote control of start/stop/reset functions (MIDI controls) of the directly connected MM3 via plug-in.
- Stand-alone operation for monitoring and metering of audio signals coming from media players or internet at the same time, and for remote control of start/stop/reset functions of MM3 MusicMeter units.
- Sampling rates up to 96 kHz

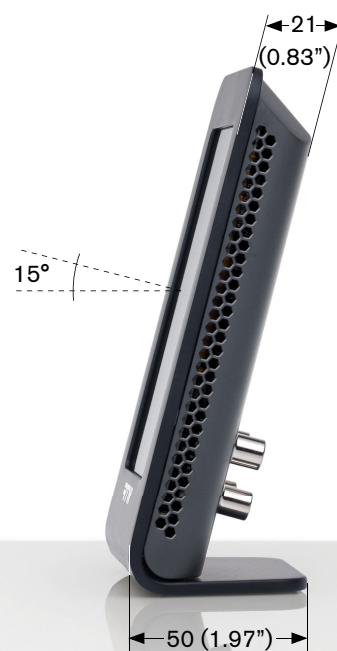


Dimensions

Table-top Unit MM3 MusicMeter



1 | Front view



2 | Side view

Connection



ATTENTION! - MM3 MusicMeter can be operated either via connection directly from a computer or via mains adapter. For this, MM3 requires an appropriate USB mains adapter and USB connection cable. RTW recommends the use of the approved USB cable and the approved wide voltage USB power supply included in the MM3 package.

Potentiometers for adjustment of the analog input sensitivity for 0 dB reading (61 mV to 12.28 V)



NOTE – Do not disadjust, if not absolutely necessary. The unit has been calibrated at RTW and offers software calibration for analog 0 dB adjustment. **Please read chapter “Calibration” in the manual before performing adjustment changes!**

Analog In R
(RCA, unbal.)



Analog In L
(RCA, unbal.)



Shield/Chassis
(Pin Assignment RCA connectors)

Signal



USB 2.0 Micro-B for:

- Power supply
- Audio input

(if connected to a computer, a special Primus USB driver is required, see Specifications)

or:

- Power supply only

(if USB mains adapter is used)



Signal lines with RCA connector shall have a ferrite core at the end being connected to MM3 MusicMeter.



S/PDIF Out
(RCA, unbal.)



S/PDIF In
(RCA, unbal.)

The S/PDIF input is permanently terminated with 75 Ω

It is recommended to use the USB connection cable and USB mains adapter included in the package!

Specifications

System

General

Power requirements:	+5 V DC via USB Micro B connector
Current drain:	400 mA nominal, power-up current is much higher
Display:	Capacitive 4.3" touch screen (272 x 480 pixel)
Connectors:	1 x USB Micro-B; USB 2.0 Full Speed connector for data exchange between computer applications and MM3, and for power supply via computer or external mains adapter
	2 x RCA-F, analog in (unbalanced, adjustable)
	1 x RCA-F, S/PDIF in (unbalanced)
	1 x RCA-F, S/PDIF out (unbalanced)
Dimensions (W x H x D):	82.5 x 138 x 50 mm
Weight:	approx. 320 g w/o mains adapter
Operating temperature:	+5° to +40° C

Functions

- Operation with one finger (touch sensitive display)
- Selectable views with different instrument combinations
- Multiformat PPM/TruePeak for 2-ch. Stereo (analog, digital, PC audio via USB) and 5.1 Surround signals (PC audio via USB)
- Loudness acc. to ITU-R BS.1770-3/1771-1, EBU R128, ATSC A/85, ARIB, OP-59, AGCOM, CALM Act
- Loudness Chart instrument
- Moving Coil (BR, VU)
- 1/3-octave spectrum analyzer (RTA)
- 2-channel Audio Vectorscope
- Numerical displays
- 2-channel Stereo downmix of the 5.1 Surround USB audio signal
- USB hybrid function: Simultaneous monitoring and metering, and additional remote control of Start/Stop/Reset function with RTW USB Connect software (PlugIn, Stand-alone)

Analog Inputs

Inputs:	2 analog inputs, 2 x RCA-F connectors
Input sensitivity:	-22 dBu (61 mV) to +24 dBu (12.28 V), adjustable via potentiometer (see note below!)
Input calibration RTW:	<ul style="list-style-type: none">▪ DIN5: 0 dB reading at +6 dBu (1.55 V)▪ BR IIa: "6" reading at +8 dBu (1.946 V) (UK)▪ VU: 0 dB reading at +4 dBu (1.228 V) (US)
Reference Levels:	<ul style="list-style-type: none">▪ for analog scales: additionally adjustable in software in steps of 0.1 dB▪ for digital scales: relation of dBu to 0 dBFS, adjustable in software in steps of 0.1 dB Example: +6 dBu reads -9 dBFS on TP60 scale with +15 dBu/0 dBFS reference setting
Impedance:	> 10 k Ω



NOTE – Please read the manual before adjustment changes are performed. The unit has been calibrated at RTW. All above mentioned analog references will change, when modifying the input sensitivity.

Digital Inputs/Outputs

	1 digital S/PDIF input (2-ch. Stereo), RCA-F, unbalanced, permanently terminated with 75 Ω
	1 digital S/PDIF output, RCA-F
Sampling rates:	28 to 104 kHz, synchronisation to digital input signal

USB Audio Input

(requires USB driver to be installed on Windows® systems, see Accessory)	
Inputs:	Readout and processing of first two USB audio data streams
Modes:	2-ch. Stereo, 5.1 Surround
Sampling rates:	28 to 104 kHz, synchronisation to input signal, internal A/D sample rate @ 48 kHz w/o external digital signal present via S/PDIF output connector
Output:	<ul style="list-style-type: none">▪ decoded, unchanged Stereo USB audio signal▪ 2-ch. downmix of the 5.1 Surround USB audio signal



Specifications (continued)

TP/PPM Bargraph

Description: PPM instrument displaying Peakmeter or TruePeak Meter bargraphs with analog or digital scales and numerical display.

PPM instrument

Input sources: analog, digital, USB audio signals
Peakmeter:

- analog, digital: 2-ch. Stereo
- USB: 2-ch. Stereo, 5.1 Surround

Display:

- Bargraph with fixed colors:
 - yellow: normal
 - red: headroom
- Numerical value on top of the bargraph

Analog Peakmeter

Analog scales:

- DIN5: +5 .. -50 dB
- TP60: +3 .. -60 dB
- Nordic: +12 .. -42 dB
- BR IIa: 7 .. 1 (British)
- SMPTE24: +24 .. -30
- NHK
- Zoom1: +1 .. -1 dB

Headroom:

- beginning (turning red) at:
- 0 dB on DIN5 scale
 - -9 dBTP on TP60 scale
 - +6 dB on Nordic scale
 - "6" on BR IIa scale
 - +6 dB on SMPTE24 scale
 - 0 dB on NHK scale

Integration time:

acc. to standard: Sample (TP60), 20 ms (BR IIa), 10 ms (all others)

Digital Peak-/TruePeakmeter

Word width: 24 bit

Digital scales:

- TP60: +3 .. -60 dB
- Dig60: 0 .. -60 dB
- Nordic: +12 .. -42 dB
- BR IIa: 7 .. 1 (British)

Headroom:

- 9 dBFS, beginning (turning red) at:
- -9 dBTP on TP60 scale
 - -9 dBFS on Dig60 scale
 - +6 dB on Nordic scale
 - "6" on BR IIa scale

Integration time (Attack):

acc. to standard: Sample (Dig60), 4x over sample (TP60), 10 ms (Nordic), 20 ms (BR IIa)

MC - Moving Coil

Description: Moving Coil instrument for the display of needle instruments for 2-channel Stereo with different modes and scales.

Moving Coil Instrument

Modes: PPM (BR IIa), VU

PPM Mode

- Ch. arrangement: Stereo horizontal, Stereo vertical
- Scale: BR IIa: 7 .. 1
- Integration time: 20 ms

VU Mode

- Ch. arrangement: Stereo horizontal, Stereo vertical
- Scale analog: VU (-20 to +3 dB)
- Scale digital: VU Digital (-20 to +3 dB)
- Lead: 0 dB, adjustable from 0 to 10 dB in steps of 1 dB

Loudness Bar/Numeric instrument

Description: Loudness Sum and Loudness Num instruments for displaying the summed loudness values M, S, or I of a loudness measurement acc. to EBU R128, ITU BS.1770-3/1771-1, ARIB, ATSC A/85, OP-59, AGCOM, CALM Act on a bargraph resp. on a numerical display.

Common Loudness Parameters

Loudness Sum display: One Loudness bargraph selectable:

- M bargraph (Momentary - summation of momentary loudness values of all channels for a short span of time)
- S bargraph (Short - loudness summation value of a dynamic time frame)
- I-Bargraph (Integrated - long term loudness value infinite or manual control)
- Onscreen keys for measurement operation: Start, Stop, Reset Loudness

Loudness Num display: M, Mmax, S, SmaxI, TPmax, LRA values, selectable
Weighting filter: K filter acc. to ITU BS.1770

Level settings for summation

- (channel weighting):
- 0.0 dB (L, R, C)
 - +1.5 dB (LS, RS)
 - Off (LFE)

TruePeak Over Threshold: -1 dBTP; adjustable from 0 to -4 dBTP in steps of 1 dBTP



Specifications (continued)

EBU R128 Loudness Mode

Target Level:	-23 LUFS; adjustable from -10 to -30 LUFS in steps of 0.5 LUFS
Scale:	EBU+9: +9 .. -18 LU (Loudness Units)
M Integration time:	400 ms (SQR)
S Integration Time:	3 s
I Silence Gate:	-70.0 LUFS
I Relative Gate:	-10.0 LU
I Tolerance Range:	±1 LU
Over Sensitivity	-1 dBFS
Over hold time:	1 s

ITU BS.1771 Loudness Mode

Target Level:	-24 LKFS; adjustable from -10 to -30 LKFS in steps of 0.5 LKFS
Scale:	ITU+9: +9 .. -18 LU (Loudness Units)
M Integration time:	400 ms (SQR)
S Integration Time:	3 s
I Silence Gate:	-70.0 LKFS
I Relative Gate:	-10.0 LU
I Tolerance Range:	±2 LU
Over Sensitivity	-2 dBFS
Over hold time:	1 s

ATSC A/85 Loudness Mode

Target Level:	-24 LKFS; adjustable from -10 to -30 LKFS in steps of 0.5 LKFS
Scale:	ATSC0: 0 .. -60 LKFS
M Integration time:	400 ms (SQR)
S Integration Time:	3 s
I Silence Gate:	-70.0 LKFS
I Relative Gate:	-10.0 LU
I Tolerance Range:	±2 LU
Over Sensitivity	-2 dBFS
Over hold time:	1 s

ARIB Loudness Mode

Target Level:	-24 LKFS; adjustable from -10 to -30 LKFS in steps of 0.5 LKFS
Scale:	ATSC0: 0 .. -60 LKFS
M Integration time:	400 ms (SQR)
S Integration Time:	3 s
I Silence Gate:	-70.0 LKFS
I Relative Gate:	-10.0 LU
I Tolerance Range:	±0 LU
Over Sensitivity	-1 dBFS
Over hold time:	1 s

OP-59 Loudness Mode

Target Level:	-24 LKFS; adjustable from -10 to -30 LKFS in steps of 0.5 LKFS
Scale:	ATSC0: 0 .. -60 LKFS
M Integration time:	400 ms (SQR)
S Integration Time:	3 s
I Silence Gate:	-70.0 LKFS
I Relative Gate:	-10.0 LU
I Tolerance Range:	±2 LU
Over Sensitivity	-2 dBFS
Over hold time:	1 s

AGCOM Loudness Mode

Target Level:	-24 LKFS; adjustable from -10 to -30 LKFS in steps of 0.5 LKFS
Scale:	ATSC0: 0 .. -60 LKFS
M Integration time:	400 ms (SQR)
S Integration Time:	3 s
I Silence Gate:	-70.0 LKFS
I Relative Gate:	-8.0 LU
I Tolerance Range:	±0.5 LU
Over Sensitivity	-2 dBFS
Over hold time:	1 s

CALM Loudness Mode

Target Level:	-24 LKFS; adjustable from -10 to -30 LKFS in steps of 0.5 LKFS
Scale:	ATSC0: 0 .. -60 LKFS
M Integration time:	400 ms (SQR)
S Integration Time:	3 s
I Silence Gate:	-70.0 LKFS
I Relative Gate:	-10.0 LU
I Tolerance Range:	±2 LU
Over Sensitivity	-2 dBFS
Over hold time:	1 s

Chart

Description:	Loudness Chart instrument for displaying and analyzing the course over time of a loudness measurement directly on the display.
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Loudness Chart Instrument

Functions:	<ul style="list-style-type: none"> Coordinate system displaying a graph with the course over time of one of the measured values TP, M, S, or I Relative Gate view switchable Adjustable time ranges Vertical Integrated bargraph switchable Adjustable tolerance levels
Display:	<ul style="list-style-type: none"> Course over time of the selected value with color filling or as line Tolerance Marker Position of the Relative Gate (doubled horizontal line) Vertical I bargraph
Colors:	<ul style="list-style-type: none"> Fill: Adoption of the corresponding colors of the Loudness Sum instrument Line: cyan (M), light red (S), green (I), yellow (TP) Tolerance Marker: coordinate system turns to light grey except the corridor defined by the tolerance settings Relative Gate: white
Time range presets:	1 m; 1 m, 5 m, 1 h selectable
Time range select:	via preset or onscreen during normal operation
Lower tolerance:	-0.0 LU; tolerance below the Target Level, adjustable from 0 to -6 LU in steps of 0.5 LU
Upper tolerance:	0.0 LU; tolerance above the Target Level, adjustable from 0 to 6 LU in steps of 0.5 LU



Specifications (continued)

VSC - Vectorscope

Description: 2-ch. Audio Vectorscope for displaying the phase relationship between the channels of a channel pair (Lissajous display).

Audio Vectorscope Instrument

Display mode: 2-channel
Inputs: L/R
AGC: fast
Grid: L/R

RTA

Description: Real Time Spectrum Analyzer instrument for displaying the spectral content of the input channels using 31 filter bands. Highpass filter for High Band (>20 kHz).

Real Time Spectrum Analyzer (RTA) Instrument

Functions:

- Peak hold on/off
- Set reference
- Selectable resolution

Input sources: Stereo pairs

Frequency range: 20 Hz to 20 kHz, highpass filter for High Band (>20 kHz)

Number of bands: 1/3-octave: 31 bands, filter acc. to IEC 225 class 2

Weighting filter: Linear

Peak hold indicator: 4 s, 2 s, off

Measuring range: 45 dB max.

Resolution: 3, 6, 9 dB

Reference: 0.0 dB; adjustable from 0.0 to 21.0 dB in steps of 1 dB

Integration time (ballistics): Fast

Items of Delivery

MM3 MusicMeter:

- Display unit with 4.3" touch screen in a table-top case for 2-channel analog or digital stereo audio signals, or stereo and 5.1 USB audio
- USB-A to Micro-USB-B connecting cable, 1.5 m length
- USB mains adapter, manual

Order no.: MM3 Music

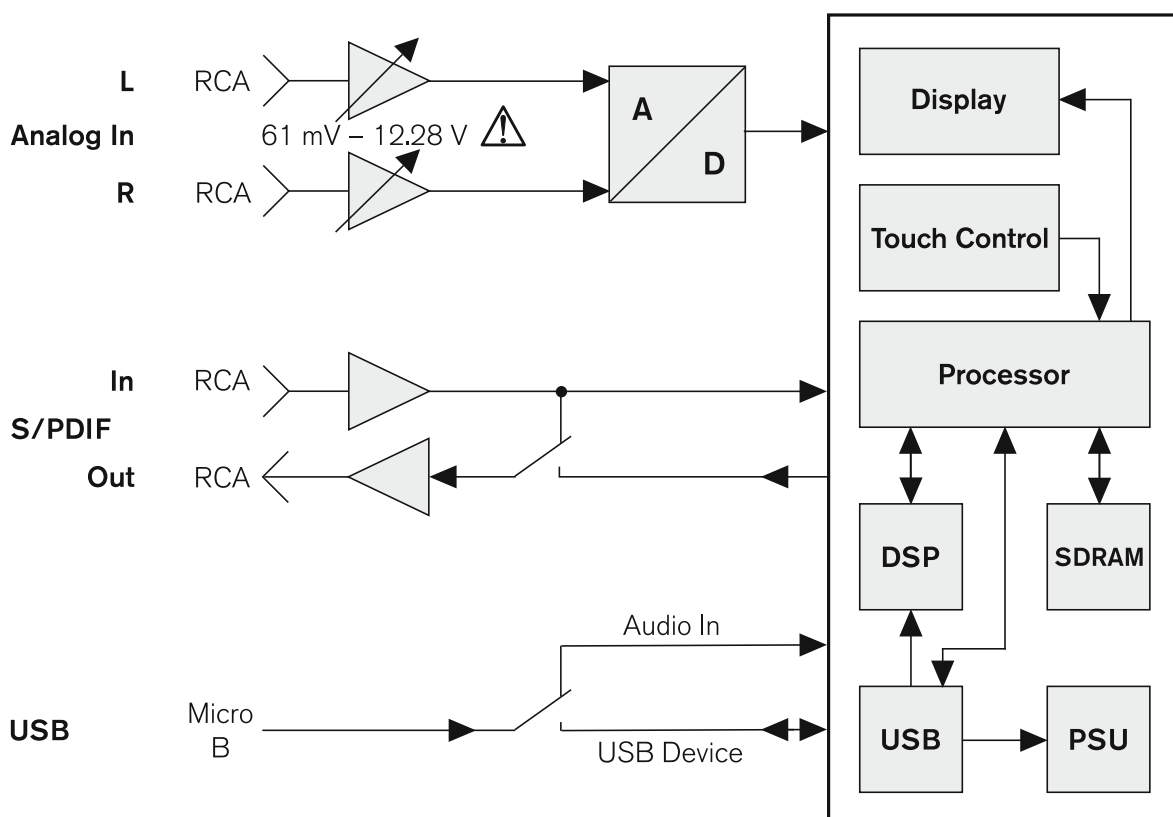
Accessory

USB-Driver: USB-Driver-Software to run MM3 MusicMeter in USB audio input mode also on Windows® systems. Installer available for download at Audio Monitors/MM3 section of members area on our website: <https://www.rtw.com/en/support/manuals-software.html>

Option

RTW USB Connect: Software (plug-in, stand-alone) for simultaneous monitoring of audio data via USB (from DAW or media players/internet) and metering with MM3 MusicMeter. Remote control of Start/Stop/Reset functions. Installer and instructions available free of charge for download from PC Software/RTW USB Connect section at members area of our web site: <https://www.rtw.com/en/support/manuals-software.html> or from RTW USB Connect product page. (Order no.: SW50300)

Block Diagram



 **Calibrated at RTW. Please refer to manual before readjustment!**

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