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Audio Test and Monitor Systems

GMS 2100 - GMS 2110 *

Sine wave generator (only for GMS 2100) – Peak meter – Phase meter – AD / DA Converter
Monitoring Router 4x1 for digital, 3x1 for analog signals – High Class Loudspeakers



GMS2100



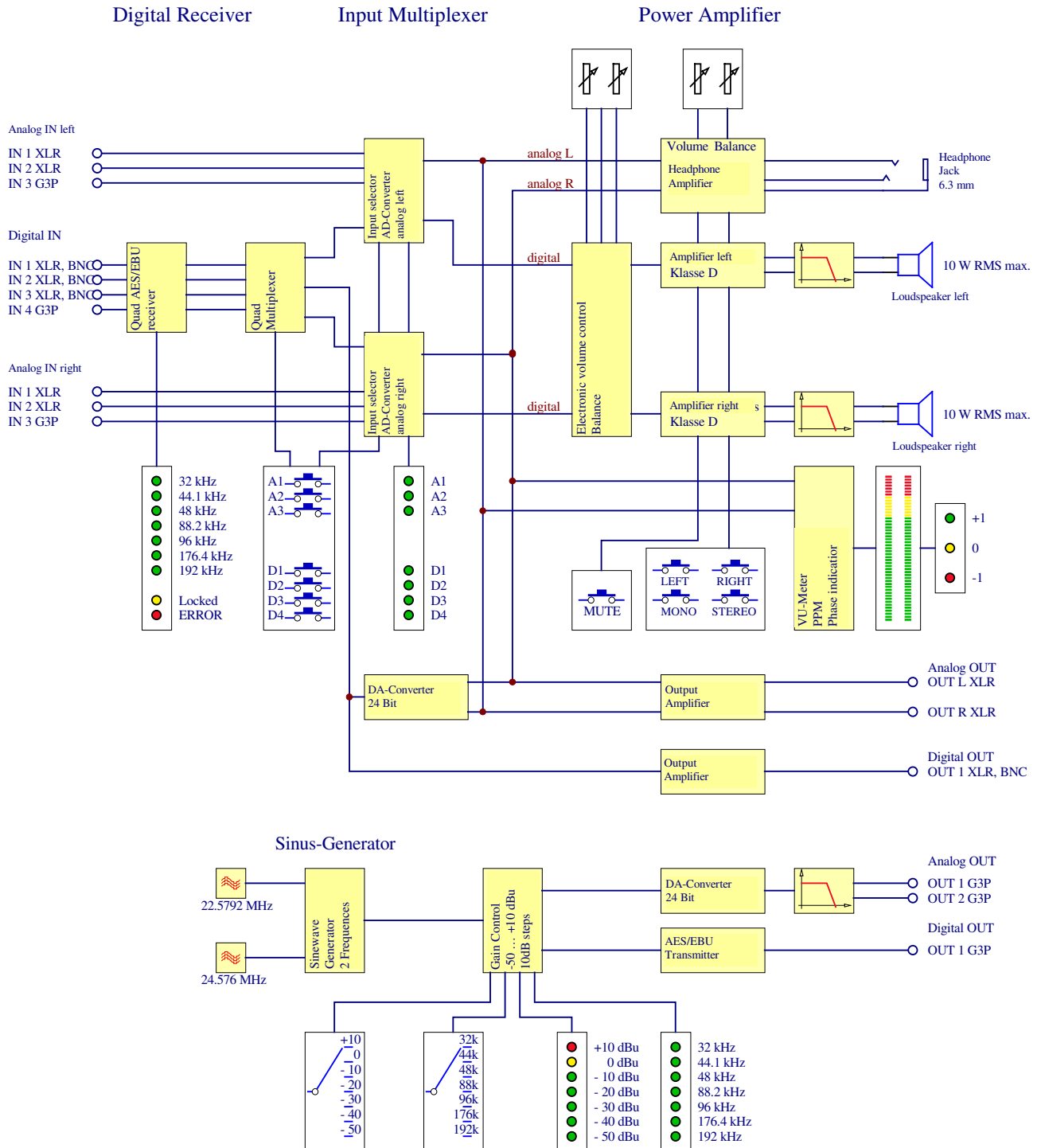
* GMS2110 (without sine wave generator, remaining features as GMS 2100)



- 2 channel audio amplifier for 3 analog and 4 digital input signals
- integrated loudspeakers, 10 W
- level indicator for 2 channels (L, R)
- phase meter
- GMS 2100: Integrated sine wave generator with 2 frequencies: 800 Hz and 1000 Hz
- * GMS2110: without sine wave generator, remaining features as GMS 2100
- headphones connector
- analog-digital converter
- digital-analog converter
- analog and digital router 3x1 for analog and 4x1 for digital inputs
- Monitor signal simultaneously on analog and digital output available



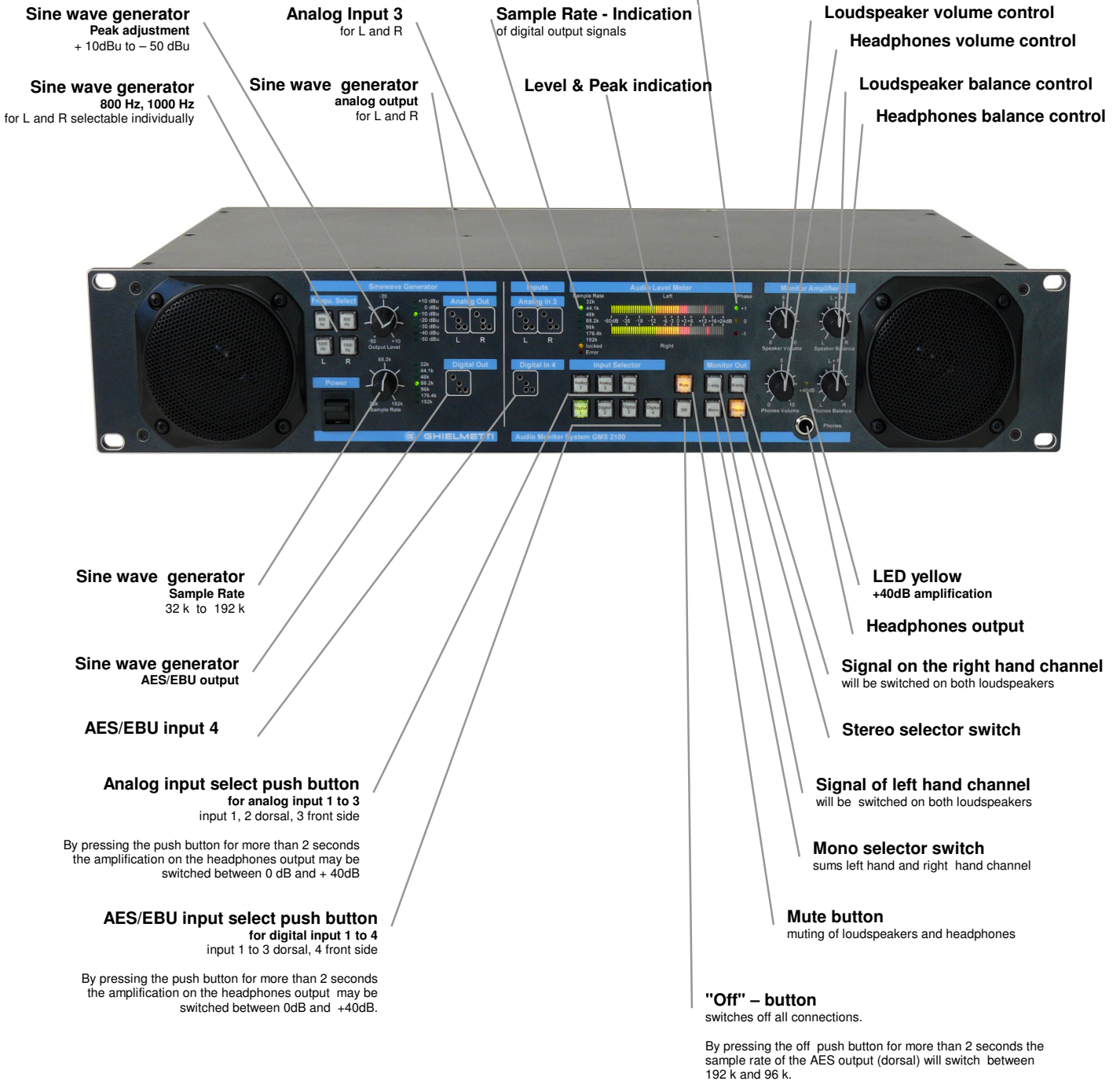
Block diagram



Operating elements on the front side

Phase meter

+1, green: mono compatible → in phase
 0, yellow: conditionally mono compatible signals
 -1, red: not mono compatible → out of phase signals





Audio inputs and monitor outputs on the back side.



Characteristics

Monitor amplifier

| | |
|---------------------------------------|--|
| Input signals: | analog to max. +27 dBu, 10 Hz ... 20 kHz digital 0.5 Vpp ... 7 Vpp |
| Sample rate | 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz und 192 kHz |
| Input impedance: | analog: 20 k Ω bei 1 kHz, symmetrical digital: 110 Ω XLR, symmetrical 75 Ω BNC, asymmetrical |
| Inputs (dorsal): | 2 analog stereo channels, symmetrical, stereo jack connector 6.35mm 2 analog Stereo channels, symmetrical, XLR female 3 digital AES/EBU channels, symmetrical, XLR female 3 digital AES/EBU channels, asymmetrical, BNC 75 Ω |
| Inputs front side: | 1 analog stereo channel, symmetrical G3P (2x Ghielmetti 3 pole) 1 digital AES/EBU channel, symmetrical G3P (1x Ghielmetti 3 pole) |
| Outputs (dorsal): | 1 analog stereo channel, symmetrical, stereo jack connector 6.35mm 1 analog stereo channel, symmetrical XLR male 1 digital AES/EBU channel, symmetrical XLR male 1 digital AES/EBU channel, asymmetrical BNC 75 Ω |
| Gain between chosen input and output: | analog: 0 dB \pm 0.1 dB digital: Reshaping of Signal to 3 Vpp (XLR, 110 Ω termination) reshaping of Signal to 2.5 Vpp (BNC, 75 Ω termination) |
| Output impedance: | analog: 60 Ω at 1 kHz digital: 110 Ω XLR, 75 Ω BNC |



| | |
|---------------------|---|
| Output (frontally): | 1 Headphones output stereo, 6.35 mm jack |
| Power output: | 10 W RMS per channel |
| Operating controls: | separate volume and balance control for loudspeakers separate volume and balance control for headphones mute pushbutton, including mute LED 7 pushbuttons for selecting input 4 pushbuttons for selecting channel (left, right, mono, stereo) 1 power switch |



Analog inputs and outputs

| | | | | |
|-----------------------|----------|-----------|---|--------------------------------------|
| No. of stereo inputs | a-b-s | dorsal | 2 | symmetrical, 6.35mm stereo jack plug |
| | a-b-s | dorsal | 2 | symmetrical, XLR female |
| | a-b-s | frontally | 1 | symmetrical, G3P |
| Input impedance | a-b | | 20 kΩ | at 1 kHz |
| | a-s | | 10 kΩ | at 1 kHz |
| | b-s | | 10 kΩ | at 1 kHz |
| No. of stereo outputs | a-b-s | dorsal | 1 | symmetrical, 6.35mm stereo jack plug |
| | a-b-s | dorsal | 1 | symmetrical, XLR male |
| Output impedance | a-b | | 60 Ω | at 1 kHz |
| | a-s | | 30 Ω | at 1 kHz |
| | b-s | | 30 Ω | at 1 kHz |
| Output level | analog: | | 0 dB ± 0.1 dB | |
| | digital: | | Signal reshaped to 3 Vpp (XLR, 110 Ohm termination) Signal reshaped to 2.5 Vpp (BNC, 75 Ohm termination) | |

Digital inputs and outputs

| | | | | |
|------------------|---|-----------|---|-------------------------|
| No. of inputs | a-b-s | dorsal | 3 | symmetrical, XLR female |
| | a-s | | 3 | asymmetrical, BNC |
| | a-b-s | frontally | 1 | symmetrical, G3P |
| Input impedance | 110 Ω XLR, 75 Ω BNC, galvanically separated | | | |
| No. of outputs | a-b-s | dorsal | 1 | symmetrical, XLR male |
| | a-s | | 1 | asymmetrical, BNC |
| Output impedance | 110 Ω XLR, 75 Ω BNC, galvanically separated | | | |

Analog input → analog output

| | |
|------------------------------|--|
| Gain (10Hz-20kHz) | 0 dB ± 0.1 dB, chosen input to output |
| Signal-to-noise ratio | > 80 dB at 1 kHz und 0dBu input signal |
| Cross talk attenuation | > 80 dB at 1 kHz |
| Switch off attenuation | > 90 dB at 1 kHz, and 0 dBu input signal |
| Electrical distortion factor | < 0.1 % at 1 kHz and 0 dBu input signal |

Analog input → digital output

| | |
|------------------------------|---|
| Gain (20Hz-20kHz) | 0 dB ± 0.3 dB, chosen input to output |
| Signal-to-noise ratio | > 90 dB at 1 kHz and 0 dBu input signal |
| Cross talk attenuation | > 90 dB at 1 kHz |
| Electrical distortion factor | < 0.1 % at 1 kHz and 0 dBu input signal |



Digital input → analog output

| | |
|------------------------------|--|
| Gain (50Hz-20kHz) | 0 dB ± 0.3 dB, chosen input to output |
| Signal-to-noise ratio | > 75 dB at 1 kHz and -15dBFS input signal |
| Cross talk attenuation | > 90 dB at 1 kHz |
| Switch off attenuation | > 100 dB at 1 kHz and -15dBFS input signal |
| Electrical distortion factor | < 0.1 % at 1 kHz and -15dBFS input signal |

Digital input → digital output

| | |
|------------------------------|--|
| Gain (10Hz-20kHz) | 0dB chosen input to output |
| Signal-to-noise ratio | > 100 dB at 1 kHz and -15dBFS input signal |
| Cross talk attenuation | > 100 dB at 1 kHz |
| Electrical distortion factor | < 0.1 % at 1 kHz and -15dBFS input signal |

Sample rates 32 k ... 192 kS/s

Output signal Jitter < 2 ns

Loudspeakers amplifier

| | |
|-----------------------------------|--|
| Power output | midrange driver , tweeter max. 10 W RMS, per channel |
| Acoustic frequency range (± 5 dB) | 80 Hz ... 16 kHz, measured at 60 cm distance |

Headphones amplifier

| | |
|-------------------------------------|----------------------------|
| Power output on 8 Ohm | max. 0.2 W RMS per channel |
| Electrical frequency range (± 3 dB) | 20 Hz ... 20 kHz |
| Distortion factor | < 0.5 % at 1 kHz |

The loudspeaker amplification will be switched off once the headset is plugged in.

Analog digital converter

| | |
|--------------------|--|
| Resolution | 24 bits |
| Sample rate | selectively 96kHz or 192 kHz (switchover through the "Off" pushbutton) |
| Input level analog | max. +15 dBu for distortion free conversion |

Digital analog converter

| | |
|-------------|--|
| Resolution | 24 bits |
| Sample rate | automatically detection for the following frequencies: |
| | 32.0 kHz ± 3 % |
| | 44.1 kHz ± 3 % |
| | 48.0 kHz ± 3 % |
| | 88.2 kHz ± 3 % |
| | 96.0 kHz ± 3 % |
| | 176.4 kHz ± 3 % |
| | 192.0 kHz ± 3 % |

| | |
|----------------------------|--|
| Sample rate display | 7 LED's green for indication of sample rate |
| | 1 LED red for indication of failure |
| | 1 LED yellow for indication, if receiver is synchronised |

Pushbuttons

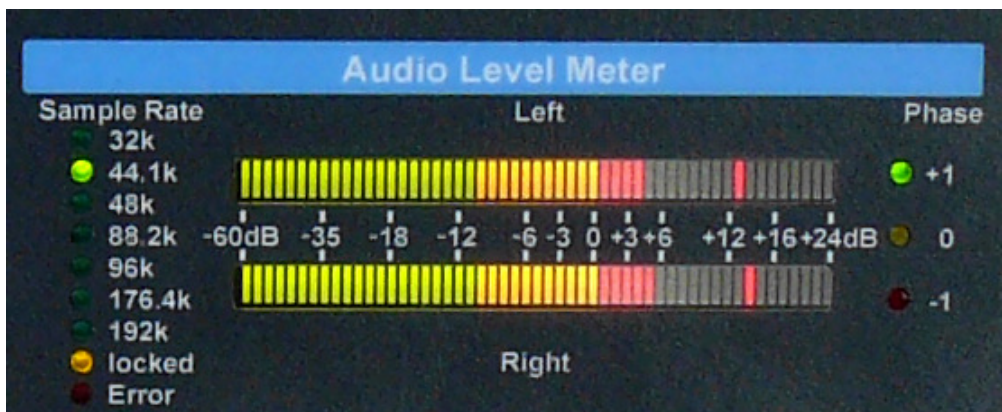
| | |
|--------------------------------------|---|
| 7 channel select pushbuttons: | Illuminated pushbuttons for each input, deactivating each other |
| "Off"-Switcher: | Illuminated pushbuttons for switching off the inputs |

| | |
|----------------|--|
| Display | Pushbutton of selected input respectively OFF lights |
|----------------|--|

| | |
|-------------|--|
| Mute | Pushbutton illuminated, when mute is switched on |
|-------------|--|

| | |
|---|---|
| Volume control (for Loudspeakers and headset) | linear potentiometer 300 °, range -80 dB ... 0 dB both channels together |
|---|---|

| | |
|--|---|
| Balance control (for Loudspeakers and headset) | linear potentiometer 300 ° 0 ° 150 ° 300 |
| | range left channel -80 dB 0 dB 0 dB |
| | range right channel 0 dB 0 dB -80 dB |

Level and phase indication


| | |
|------------------------------|---|
| Indication for level: | VU 53 segment bar graph LED per channel |
|------------------------------|---|

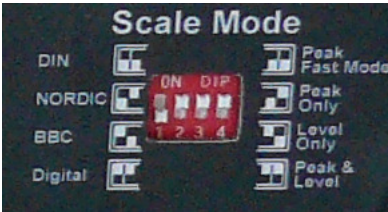
| | |
|-----------------------------------|--|
| Indication for peak value: | PPM 53 segment bar graph LED per channel 1 segment at the time |
|-----------------------------------|--|

| | |
|--------------------------|---|
| Indication range: | -60 dBu ... +24 dBu, scale specific labelling available |
|--------------------------|---|

Indication accuracy

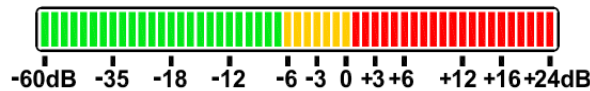
| | | |
|--------------|-----------------|-------------------------|
| Nordic mode: | -60 ... -50 dBu | 5.0 dB ± 1.0 dB per LED |
| | -50 ... -20 dBu | 3.0 dB ± 1.0 dB per LED |
| | -20 ... -18 dBu | 2.0 dB ± 0.5 dB per LED |
| | -18 ... +18 dBu | 1.0 dB ± 0.2 dB per LED |
| | +18 ... +24 dBu | 2.0 dB ± 0.5 dB per LED |

Scaling of indication:

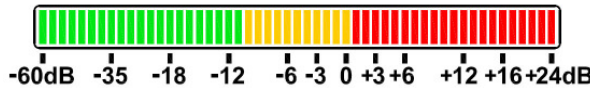


closable through DIP switch on dorsal

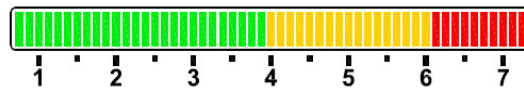
DIN 45406



Nordic N9

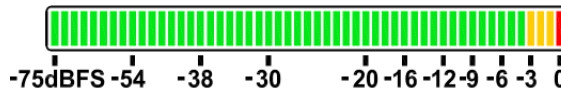


BBC British IIa



Scaling stripes for BBC scaling (accessories, to paste over DIN scaling)

Digital



Scaling stripes for Digital Scaling (accessories, to paste over DIN scaling)

Integration time:

| | |
|---------|----------------------|
| DIN | VU 300 ms, PPM 5 ms |
| Nordic | VU 300 ms, PPM 5 ms |
| BBC | VU 300 ms, PPM 10 ms |
| Digital | VU 300 ms, PPM 10 ms |

Reverse time:

| | |
|---------|-------------------------------------|
| DIN | VU 300 ms, PPM 1.7s pro 20 dB |
| Nordic | VU 300 ms, PPM 1.7s pro 20 dB |
| BBC | VU 300 ms, PPM 2.8s from "7" to "1" |
| Digital | VU 300 ms, PPM 1.7s pro 20 dB |

Indication mode:

| | |
|------------------|--|
| Peak, Fast Mode: | Indication of each value (each sample) |
| Peak only: | Peak value indication in the hold mode |
| Level only: | Level value indication |
| Peak & Level: | Level and peak indication |

Phase indication:

For controlling mono compatibility of stereo signals (r = correlation coefficient)
 LED green: $+0.1 < r < +1$ (mono compatible → in phase)
 LED yellow $-0.1 < r < +0.1$ (conditionally mono compatible signals)
 LED red: $-0.1 > r > -1$ (not mono compatible out-of-phase signals)



Scaling of modulation display

| LED-No. | DIN [dB] | Nordic [dB] | BBC | Digital [dBFS] |
|---------|----------|-------------|-----|----------------|
| 1 | -60 | -60 | - | -75 |
| 2 | -55 | -55 | - | -70 |
| 3 | -50 | -50 | 1 | -65 |
| 4 | -47 | -47 | - | -63 |
| 5 | -44 | -44 | - | -61 |
| 6 | -41 | -41 | - | -59 |
| 7 | -38 | -38 | - | -57 |
| 8 | -35 | -35 | - | -54 |
| 9 | -32 | -32 | - | -51 |
| 10 | -29 | -29 | - | -48 |
| 11 | -26 | -26 | 2 | -45 |
| 12 | -23 | -23 | - | -43 |
| 13 | -20 | -20 | - | -41 |
| 14 | -18 | -18 | - | -39 |
| 15 | -17 | -17 | - | -38 |
| 16 | -16 | -16 | - | -37 |
| 17 | -15 | -15 | - | -36 |
| 18 | -14 | -14 | - | -35 |
| 19 | -13 | -13 | 3 | -34 |
| 20 | -12 | -12 | - | -33 |
| 21 | -11 | -11 | - | -32 |
| 22 | -10 | -10 | - | -31 |
| 23 | -9 | -9 | - | -30 |
| 24 | -8 | -8 | - | -29 |
| 25 | -7 | -7 | - | -28 |
| 26 | -6 | -6 | - | -27 |
| 27 | -5 | -5 | 4 | -26 |
| 28 | -4 | -4 | - | -25 |
| 29 | -3 | -3 | - | -24 |
| 30 | -2 | -2 | - | -23 |
| 31 | -1 | -1 | - | -22 |
| 32 | 0 | T | - | -21 |
| 33 | 1 | 1 | - | -20 |
| 34 | 2 | 2 | - | -19 |
| 35 | 3 | 3 | 5 | -18 |
| 36 | 4 | 4 | - | -17 |
| 37 | 5 | 5 | - | -16 |
| 38 | 6 | 6 | - | -15 |
| 39 | 7 | 7 | - | -14 |
| 40 | 8 | 8 | - | -13 |
| 41 | 9 | 9 | - | -12 |
| 42 | 10 | 10 | - | -11 |
| 43 | 11 | 11 | 6 | -10 |
| 44 | 12 | 12 | - | -9 |
| 45 | 13 | 13 | - | -8 |
| 46 | 14 | 14 | - | -7 |
| 47 | 15 | 15 | - | -6 |
| 48 | 16 | 16 | - | -5 |
| 49 | 17 | 17 | - | -4 |
| 50 | 18 | 18 | - | -3 |
| 51 | 20 | 20 | 7 | -2 |
| 52 | 22 | 22 | - | -1 |
| 53 | 24 | 24 | - | 0 |

Sine Wave Generator



Output frequencies: 800 Hz and 1000 Hz

Frequency for left hand and right hand channel are individually, the levels are adjustable together. The output frequencies can be tapped as analog output and as AES/EBU signal.

Digital sampling rates:

32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz

AES/EBU format: Pro

Outputs frontside: 1 analog stereo channel, symmetrical G3P (2x Ghielmetti 3 pole)
1 digital AES/EBU channel, symmetrical G3P (1x Ghielmetti 3 pole)

Output level analog: adjustable in steps of 10 dB between -50 dBu and +10 dBu

Output level digital: 3 Vpp

Turn switch: linear potentiometer for sampling rate, 7 steps
linear potentiometer for volume of sinus signals, 7 steps

Display: LEDs for sampling rate indication
LEDs for volume indication in steps of 10 dB

General indication

Operating voltage: 90 VAC ... 267 VAC, 47 ... 63 Hz

Power: 60 Wmax.

Operation temperature: 0 °C ... +45 °C

Storage temperature: -20 °C ... +55 °C

Housing: 19" rack mounting, 2 RU, depth 250 mm

Weight: 5.8 kg

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