Tender Specification: X2 Modul 30 (MD30) - v1.1 en (01/2024)

**Active Matrix Array loudspeaker with integrated signal processing and amplification for 3D Audio-Beamforming and Wave Field Synthesis applications**

Active, digitally steerable Matrix Array loudspeaker with 30 x 2.5” loudspeaker drivers. Each driver individually signalled processed and amplified through onboard DSP and integrated digital amplifier.

One loudspeaker shall be able to generate up to four algorithmically optimized, independent sound fields based on 3D-Audio-Beamforming as well as Wave Field Synthesis. The algorithmic optimization of the signal processing coefficients of each individual loudspeaker driver shall be calculated in relation to the listening area, the position of the loudspeakers as well as the respective architectural environments that are to be actively avoided by the sound field. This way, the optimization algorithms ensure uniform coverage and spectral consistency within a zone.

In addition, the loudspeaker shall be able to generate 8 independently user-adjustable (parametric) audio beams. Vertical and horizontal steering angle as well as vertical and horizontal opening angle shall be adjustable in precise incremental steps of 0.1°.

The loudspeaker shall integrate a powerful Field Programmable Gate Array (FPGA) processor to generate sound fields in real time.

Power shall be supplied via Power-over-Ethernet (PoE) with a supply power of up to 90 watts per port (IEEE 802.3bt Type 4). The loudspeaker shall have two RJ45 ports, allowing for a maximum power supply of 180 watts.

The same RJ45 ports shall serve as redundant audio-over-IP connections for RAVENNA and AES67 (optionally: Dante®), as well as for IP-based system controlling and monitoring.

Programming of the loudspeaker shall be facilitated using a sound system design software[[1]](#footnote-1) with an interactive 3D viewport for visualizing matrix arrays, audio beams, and simulated direct sound levels.

System management and monitoring shall be carried out by an central control server[[2]](#footnote-2). This system management server shall provide a browser-based user interface[[3]](#footnote-3) that can be accessed via the local network. In addition, the operational readiness or error condition shall be visually indicated by an LED on the front of the speaker.

The loudspeaker system shall consist of a sturdy loudspeaker frame and a loudspeaker module, which slots into the frame. The housing of the loudspeaker module shall be made of lightweight, corrosion-resistant aluminum. The system shall be powder-coated in black or white and shall be optionally available in all RAL colors. A highly sound-permeable front grille made of powder-coated steel shall protect the loudspeaker drivers inside and shall be available in an impact resistant version (according to DIN 18032-1).

Multiple loudspeakers shall be arrayable using the loudspeaker frames to form Matrix Arrays of different sizes and aspect ratios. The Matrix Array loudspeaker shall be usable in both landscape and portrait orientation.

Technical Data

**Electroacoustic characteristics**

Design: Matrix Array loudspeaker

Configuration: 30 x 2,5”

Amplification: Active, 30 x digital amplifier

Max. SPL (1m)[[4]](#footnote-4): 130 dB

Frequency response[[5]](#footnote-5): 110 - 20,000 Hz

Number of audio beams: 4 algorithmically optimized beams, 8 parametric beams

**Mechanical characteristics**

Loudspeaker cabinet: Corrosion-resistant aluminium

Loudspeaker grille: Steel

Loudspeaker frame: Steel

Colors: black or white powder coated, other RAL colors optional

Dimensions (W x H x D): ca. 601 mm x 311 mm x 140 mm / 23.7" x 12.2" x 5.5"

Weight[[6]](#footnote-6): ca. 22.5 kg / 49.6 lbs

**Connections**

Physical connections: 2 x RJ45 (for AoIP, Control, and PoE++)

Audio-over-IP: AES67 / RAVENNA / opt.: Dante®
 Primary and secondary ports for redundancy

Control network: HOLOPLOT Control Network (via HOLOPLOT Controller)

**Electrical characteristics**

Power supply: PoE++ (IEEE 802.3bt Type 4)

Power consumption: Standby 5 W, max. 90 W (1 PoE++ port) / 180 W (2 PoE++ ports)

Protection circuit: Overheating, short circuit, overload

**Software & Firmware**

Firmware/operating system: HOLOPLOT OS

System planning: HOLOPLOT Plan (desktop-based application)

Control & monitoring: HOLOPLOT Control (browser-based application)

Manufacturer: HOLOPLOT

Type: X2 Module 30 (MD30)

1. HOLOPLOT Plan [↑](#footnote-ref-1)
2. HOLOPLOT Controller [↑](#footnote-ref-2)
3. HOLOPLOT Control [↑](#footnote-ref-3)
4. Peak level referred back to 1 m under free field conditions using bandpass filtered pink noise signal with a 12 dB crest factor according to IEC 60268 [↑](#footnote-ref-4)
5. -10 dB rel max SPL [↑](#footnote-ref-5)
6. Net weight of the loudspeaker with loudspeaker frame, excluding additional hanging accessories. [↑](#footnote-ref-6)