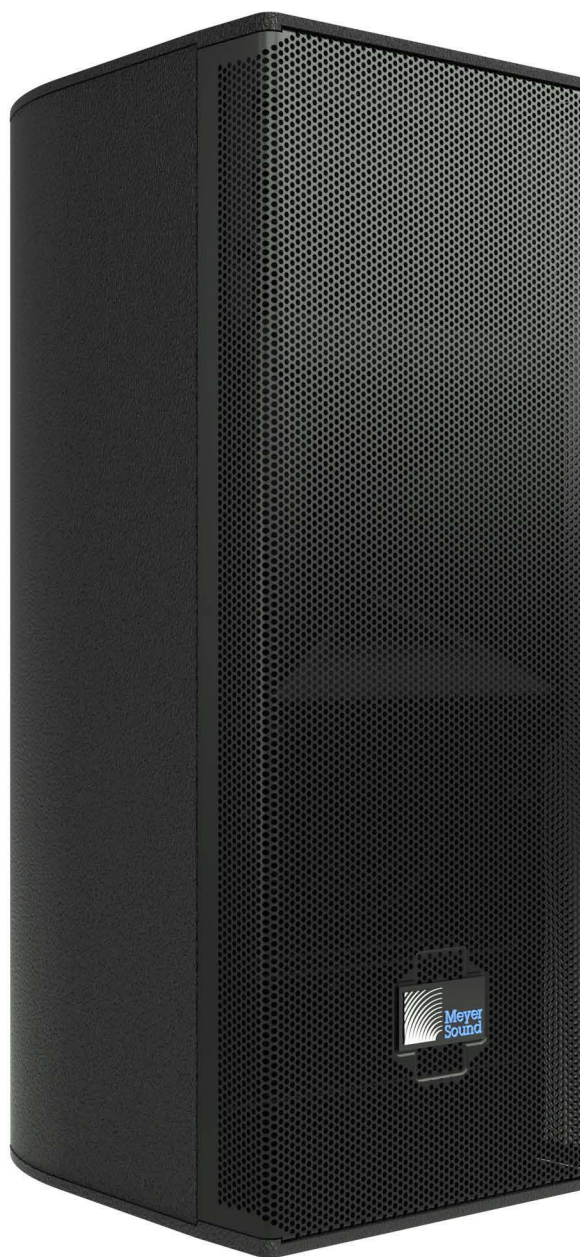


ULTRA-X20/22/23 Wide/Compact/Broad Coverage  
Loudspeaker



*Keep these important operating instructions.  
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ULTRA-X20/22/23 Operating Instructions, PN 05.297.005.01 B

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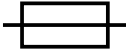




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## IMPORTANT SAFETY INSTRUCTIONS

These symbols indicate important safety or operating features in this booklet and on the frame or chassis:

### SYMBOLS USED

					
<b>Dangerous voltages: risk of electric shock</b>	<b>Important operating instructions</b>	<b>Replaceable Fuse</b>	<b>Protective earth ground</b>	<b>Hot surface: do not touch</b>	<b>Electronic instructions for use: instruction location in QR code</b> 
<b>Gefährliche Spannungen: Stromschlaggefahr</b>	<b>Hinweis auf wichtige Punkte der Betriebsanleitung</b>	<b>Austauschbare Sicherung</b>	<b>Schutzerde</b>	<b>Heiße Oberfläche: nicht berühren</b>	<b>Elektronische Gebrauchsanweisung: anweisungsort im QR-Code</b>
<b>Pour indiquer les risques résultant de tensions dangereuses</b>	<b>Instructions d'utilisation importantes</b>	<b>Fusible remplaçable</b>	<b>Terre de protection</b>	<b>Surface chaude: ne pas toucher</b>	<b>Mode d'emploi électronique: emplacement des instructions dans le code QR</b>
<b>Para indicar voltajes peligrosos</b>	<b>Instrucciones importantes de funcionamiento y/o Mantenimiento</b>	<b>Fusible reemplazable</b>	<b>Toma de tierra de protección</b>	<b>Superficie caliente: no tocar</b>	<b>Instrucciones de uso electrónicas: ubicación de instrucciones en el código QR</b>

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with Meyer Sound's installation instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9. Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. The AC mains plug or appliance coupler shall remain readily accessible for operation.
11. Only use attachments/accessories specified by Meyer Sound.
12. Use only with the caster rails or rigging specified by Meyer Sound, or sold with the apparatus. Handles are for carrying only.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. If equipped with an external fuse holder, the replaceable fuse is the only user-serviceable item. When replacing the fuse, only use the same type and the same value.
15. Refer all other servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug has been damaged; liquid has been spilled or objects have fallen into the apparatus; rain or moisture has entered the apparatus; the apparatus has been dropped; or when for undetermined reasons the apparatus does not operate normally.



**WARNING:** For Meyer Sound IntelligentDC Power Supply models MPS-488HP and MPS-482HP, the external wiring connected to the output terminals of the units require installation by an Instructed person or the use of ready-made leads or cords.



**WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not install the apparatus in wet or humid locations without using weather protection equipment from Meyer Sound.



**WARNING:** Class I apparatus shall be connected to a mains socket outlet with a protective earthing connection.



**CAUTION:** Disconnect the mains plug before disconnecting the power cord from the loudspeaker.

## English

- To reduce the risk of electric shock, disconnect the apparatus from the AC mains before installing audio cable. Reconnect the power cord only after making all signal connections.
- Connect the apparatus to a two-pole, three-wire grounding mains receptacle. The receptacle must be connected to a fuse or circuit breaker. Connection to any other type of receptacle poses a shock hazard and may violate local electrical codes.
- Do not install the apparatus in wet or humid locations without using weather protection equipment from Meyer Sound.
- Do not allow water or any foreign object to get inside the apparatus. Do not put objects containing liquid on or near the unit.
- To reduce the risk of overheating the apparatus, avoid exposing it to direct sunlight. Do not install the unit near heat-emitting appliances, such as a room heater or stove.
- If equipped with an external fuse holder, the replaceable fuse is the only item that can be serviced by the user. When replacing the fuse, only use the same type and value.
- This apparatus contains potentially hazardous voltages. Do not attempt to disassemble the unit. The only user-serviceable part is the fuse. All other repairs should be performed only by factory-trained service personnel.

## Deutsch

- Zur Minimierung der Gefahr eines elektrischen Schlags trennen Sie das Produkt vor dem Anschluss von Audio- und/oder Steuerleitungen vom Stromnetz. Das Netzkabel darf erst nach Herstellung aller Signalverbindungen wieder eingesteckt werden.

- Das Produkt an eine vorschriftsgemäss installierte dreipolige Netzsteckdose (Phase, Neutralleiter, Schutzleiter) anschließen. Die Steckdose muss vorschriftsgemäß mit einer Sicherung oder einem Leitungsschutzschalter abgesichert sein. Das Anschließen des Produkts an eine anders ausgeführte Stromversorgung kann gegen Vorschriften verstossen und zu Stromunfällen führen.
- Das Produkt nicht an einem Ort aufstellen, an dem es direkter Wassereinwirkung oder übermäßig hoher Luftfeuchtigkeit ausgesetzt werden könnte, solange es sich nicht um ein Produkt handelt, dass mit der Meyer Sound Weather Protection Option ausgestattet ist.
- Vermeiden Sie das Eindringen von Wasser oder Fremdkörpern in das Innere des Produkts. Stellen Sie keine Objekte, die Flüssigkeit enthalten, auf oder neben dem Produkt ab.
- Um ein Überhitzen des Produkts zu verhindern, halten Sie das Gerät von direkter Sonneneinstrahlung fern und stellen Sie es nicht in der Nähe von wärmeabstrahlenden Geräten (z.B. Heizgerät oder Herd) auf.
- Bei Ausstattung mit einem externen Sicherungshalter ist die austauschbare Sicherung das einzige Gerät, das vom Benutzer gewartet werden kann. Verwenden Sie beim Austausch der Sicherung nur den gleichen Typ und Wert.
- Dieses Gerät enthält möglicherweise gefährliche Spannungen. Versuchen Sie nicht, das Gerät zu zerlegen. Der einzige vom Benutzer zu wartende Teil ist die Sicherung. Alle anderen Reparaturen dürfen nur von im Werk geschultem Servicepersonal ausgeführt werden.

## Français

- Pour éviter tout risque d'électrocution, débranchez l'enceinte de la prise secteur avant de mettre en place le câble audio. Ne rebranchez le cordon secteur qu'après avoir procédé à toutes les connexions de signal audio
- Brancher l'appareil sur une prise secteur à trois fils et deux pôles avec mise à la terre. La prise doit être reliée à un fusible ou à un disjoncteur. Le branchement à tout autre type de prise présente un risque de choc électrique et peut enfreindre les codes locaux de l'électricité.
- N'installez pas l'enceinte dans des endroits humides ou en présence d'eau sans utiliser d'équipements de protection adéquats fournis par Meyer Sound.
- Ne laissez pas d'eau ou d'objet étranger, quel qu'il soit, pénétrer à l'intérieur de l'enceinte. Ne posez pas d'objet contenant du liquide sur ou à proximité de l'enceinte.
- Pour réduire les risques de surchauffe, évitez d'exposer directement l'enceinte aux rayons du soleil. Ne l'installez pas à proximité de sources de chaleur, radiateur ou four par exemple.

- S'il est équipé d'un porte-fusible externe, le fusible remplaçable est le seul élément qui peut être réparé par l'utilisateur. Lors du remplacement du fusible, n'utilisez que le même type et la même valeur.
- Cet appareil contient des tensions potentiellement dangereuses. N'essayez pas de démonter l'appareil. Le fusible est la seule pièce réparable par l'utilisateur. Toutes les autres réparations doivent être effectuées uniquement par du personnel de maintenance formé en usine.

## Español

- Para reducir el riesgo de descarga eléctrica, desconecte el aparato de la red eléctrica antes de instalar el cable de audio. Vuelva a conectar el cable de alimentación sólo después de realizar todas las conexiones de señal.
- Conecte el aparato a una toma de corriente de tres hilos y dos polos con conexión a tierra. El receptáculo debe estar conectado a un fusible o disyuntor. La conexión a cualquier otro tipo de receptáculo representa un riesgo de descarga eléctrica y puede violar los códigos eléctricos locales.
- No instale el aparato en lugares húmedos o mojados sin usar el equipo de protección contra intemperie de Meyer Sound.
- No permita que penetre agua u otros objetos extraños en el interior del aparato. No coloque objetos que contengan líquido sobre o cerca de la unidad.
- Para reducir el riesgo de sobrecalentamiento del aparato, evite exponerlo a la luz solar directa. No instale la unidad cerca de aparatos que emitan calor, como un calefactor o una estufa.
- Si está equipado con un portafusibles externo, el fusible reemplazable es el único elemento que puede ser reparado por el usuario. Cuando reemplace el fusible, use solamente el mismo tipo y valor.
- Este aparato contiene voltajes potencialmente peligrosos. No intente desmontar la unidad. La única pieza que el usuario puede reparar es el fusible. Todas las demás reparaciones deben ser realizadas únicamente por personal de servicio capacitado de fábrica.



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# INTRODUCTION

## HOW TO USE THIS MANUAL

Please read these instructions in their entirety before configuring a Meyer Sound loudspeaker system. In particular, pay close attention to material related to safety issues.

As you read these instructions, you will encounter the following icons for notes, tips, and cautions:



**NOTE:** A note identifies an important or useful piece of information relating to the topic under discussion.



**TIP:** A tip offers a helpful tip relevant to the topic at hand.



**CAUTION:** A caution gives notice that an action may have serious consequences and could cause harm to equipment or personnel, or could cause delays or other problems.

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- [meyersound.com/contact](https://www.meyersound.com/contact) (recommended)
- +1 510 486.1166  
(Monday through Friday 9:00 am to 5:00 pm PST)
- +1 510 486.0657  
(after hours support)

## THE ULTRA-X20/22/23 LOUDSPEAKER

Meyer Sound's ULTRA-X20 design extends the ULTRA-X40 point source technology to a smaller version for size- and weight-critical applications.

The ULTRA-X20/22/23 loudspeaker series features include:

- A highly efficient class-D amplifier that reproduces any sound source with linearity over a wide dynamic range.
- A small cabinet that weighs 27 lb (12.3 kg).
- A concentric driver configuration that supports directional control of frequencies down to 600 Hz.
- A well-behaved rotatable horn that was designed for very precise, even coverage. This horn design, in conjunction with the concentric driver configuration, delivers the same pattern regardless of orientation.

The ULTRA-X20 loudspeaker provides high power output, low distortion, and consistent polar response in a very compact, vented enclosure. The loudspeaker features two 5-inch cone low-frequency drivers and one 2-inch diaphragm compression driver coupled with a rotatable 110° x 50° constant-Q horn.



*ULTRA-X20 without Grille*

A more controlled pattern is available on the ULTRA-X22 model, which is fitted with a 80° x 50° constant-Q rotatable horn. A broad coverage version, the ULTRA-X23, offers a 110° x 110° constant-Q horn.

Because of its proprietary, high-frequency horn, the beamwidth remains consistent within close tolerances in both the horizontal and vertical planes, and across the horn's operating frequency range.

A proprietary three-channel, class-D digital power amplifier powers the ULTRA-X20 loudspeaker, which has a total peak power output of 860 watts. Audio processing includes electronic crossover, correction filters for phase and frequency response, and driver protection circuitry.

The amplifier/processing package incorporates Meyer Sound's Intelligent AC™, which auto-selects the correct operating voltage, suppresses high voltage transients, filters EMI and provides soft start power-up. The ULTRA-X20 provides XLR (analog version) or etherCON TOP (Milan™ Certified digital version) audio connectors, and PowerCON 20 (analog version) or powerCON TRUE1 TOP (digital and weather-protected versions) input and looping output power connectors.

Remote monitoring is possible on the analog version via the optional RMS remote monitoring system module, which in conjunction with the optional RMServer™ hardware unit, provides comprehensive monitoring of loudspeaker parameters from a host computer running Compass® Control Software. The digital version provides integrated monitoring accessible via Compass Control Software.

Meyer Sound builds the slightly curved enclosure out of aluminum with a lightly textured black finish. A powder-coated, round-perforated steel grille provides protection to the front of the loudspeaker.

The ULTRA-X20 includes two integral M8 rigging points on each end to enable a variety of configurations including those requiring pole mounting, hanging individually from a single point, wall mounting or ceiling mounting. Optional rigging accessories include a U-bracket, a yoke, a 35 mm to M8 pole adapter, and a pinnable link on a channel that allows the hanging of one or two units from a single pick-up point. It is also possible to mount the ULTRA-X20/22/23 under an ULTRA-X40/42 using one MTC-X40 and one MTC-X20. The heat sink mounting holes provide additional mounting capabilities using third-party wall mount adapters with 5-inch by 2.75-inch (127 mm by 70 mm) hole patterns.

Other options include weather protection and custom color finishes.



ULTRA-X20/22/23 Rear View (Analog, Left and Digital, Right)



*ULTRA-X20 with MUB-X20 Ceiling Mount Position*



*ULTRA-X20 with MYA-X20 Mounting Yoke*



*ULTRA-X20 with MUB-X20 in Vertical Wall Mount Position*



*ULTRA-X20 and MYA-X20 Pole-mounted with PAS-M8 Adapter Sleeve*



*ULTRA-X20 with MTC-X20 Top Channel Kit and Shackle*



*ULTRA-X20 Mounted Beneath ULTRA-X40 using One MTC-X40 and One MTC-X20*



*Two ULTRA-X20 Rigged Together with Two MTC-X20 Top Channel Kits*



*ULTRA-X20 Pole-mounted on USW-112P with PAS-M8 Adapter Sleeve*



*ULTRA-X20 Heat Sink Third-party Accessory Mounting Capability  
5-inch x 2.75-inch (127 mm x 70 mm) Hole Pattern*



## POWER REQUIREMENTS

The ULTRA-X20/22/23 loudspeaker combines advanced loudspeaker technology with equally advanced power capabilities. Understanding power distribution, voltage and current requirements, and electrical safety guidelines is critical for the safe operation of the ULTRA-X20/22/23.

### AC POWER DISTRIBUTION

All components in an audio system (self-powered loudspeakers, mixing consoles, and processors) must be properly connected to an AC power distribution system, ensuring that AC line polarity is preserved and that all grounding points are connected to a single node or common point using the same cable gauge (or larger) as the neutral and line cables.

**CAUTION:** Make sure the voltage received by the ULTRA-X20/22/23 loudspeaker remains within its 90–264 V AC operating range. In addition, the ground line must always be used for safety reasons and the line-to-ground voltage should never exceed 250 V AC (typically 120 V AC from line to ground).

**CAUTION:** Before applying AC power to any Meyer Sound self-powered loudspeaker, make sure that the voltage potential difference between the neutral and earth-ground lines is less than 5 V AC when using single-phase AC wiring.

**NOTE:** Improper grounding of connections between loudspeakers and the rest of the audio system may produce noise or hum, or cause serious damage to the input and output stages of the system's electronic components.

### 120 V AC, 3-Phase Wye System (Single Line)

#### Line-Neutral-Earth/Ground

Figure 1 illustrates a basic 120 V AC, 3-phase Wye distribution system with the loudspeaker load distributed across all three phases, with each loudspeaker connected

to a single line and common neutral and earth/ground lines. This system delivers 120 V AC to each loudspeaker.

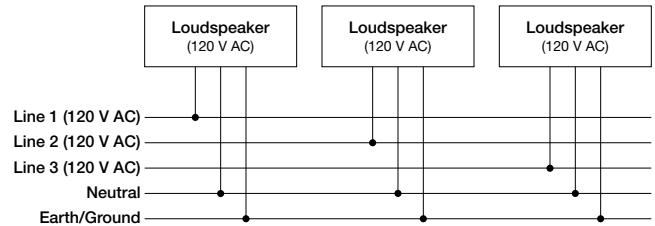


Figure 1: 120 V AC, 3-Phase Wye System (Single Line to Loudspeakers)

### 120 V AC, 3-Phase Wye System (Two Lines)

#### Line-Line-Earth/Ground

Figure 2 illustrates a 120 V AC, 3-phase Wye distribution system with each loudspeaker connected to two lines and a common earth/ground line. This configuration is possible because ULTRA-X20/22/23 tolerates elevated voltages from the ground line and does not require a neutral line. This system delivers 208 V AC to each loudspeaker.

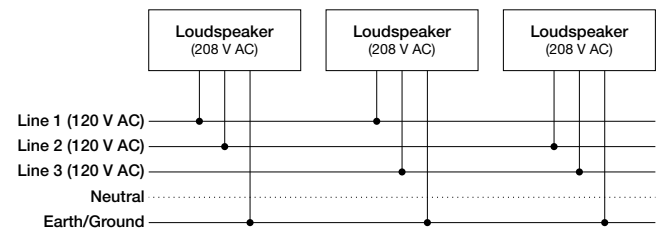


Figure 2: 120 V AC, 3-Phase Wye System (Two Lines to Loudspeakers)

**TIP:** The 120 V AC, 3-phase Wye system with two lines is recommended because it allows loudspeakers to draw less current than with single-line systems, thereby reducing voltage drop due to cable resistance. It also excludes the potential of varying ground to neutral voltages producing an audible hum.

### 230 V AC, 3-Phase Wye System (Single Line)

#### Line-Neutral-Earth/Ground

Figure 3 illustrates a basic 230 V AC, 3-phase Wye distribution system with the loudspeaker load distributed across all three phases, with each loudspeaker connected

to a single line and common neutral and earth/ground lines. This system delivers 230 V AC to each loudspeaker.

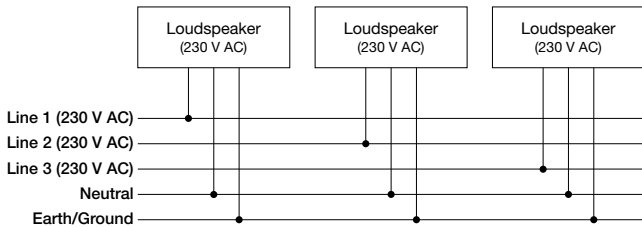


Figure 3: 230 V AC, 3-Phase Wye System (Single Line to Loudspeakers)

**CAUTION:** For 230 V AC, 3-phase Wye systems, never connect two lines to the AC input of ULTRA-X20/22/23, as the resulting voltage would exceed the upper voltage limit (275 V AC) and will damage the loudspeaker.

## AC CONNECTORS

The ULTRA-X20/22/23 user panel includes two powerCON 20 connectors (Figure 4), one for AC Input (blue) and one for AC Loop Output (gray).



Figure 4: AC Input (Top) and AC Loop Output (Bottom) Connectors

The weather-protected and digital versions use the extremely robust PowerCON TRUE1 TOP (Total Outdoor Protection) chassis connector (Figure 5).

**CAUTION:** The PowerCON TRUE1 TOP chassis connectors are certified for outdoor protection only when used in combination with PowerCON True1 TOP cable connectors or with the sealing cap in place when the chassis connectors are not in use.

**CAUTION:** Ensure the rubber sealing cover is in place when either connector (input or loop) is not in use.



Figure 5: PowerCON TRUE1 TOP Connector Panel (Input Sealing Cover Open, Loop Sealing Cover Closed)

## AC Input (Blue)

The blue AC Input connector supplies power to ULTRA-X20/22/23. The 3-conductor powerCON 20 is rated at 20 A and uses a locking connector that prevents accidental disconnections. A 10-foot AC power cable, rated at 15 A, is included with each loudspeaker. If the included AC power cable is replaced, make sure to use a cable with the appropriate power plug (on the other end) for the region where the unit will be operated. ULTRA-X20/22/23 requires



a grounded outlet. To operate safely and effectively, it is extremely important that the entire system be properly grounded.

The AC Input connector also supplies power to any additional loudspeakers connected to the loudspeaker’s gray Loop Output connector.

**CAUTION:** When looping AC power for loudspeakers, do not exceed the current capability of the AC Input connector (20 A) or the included AC power cable (15 A). Consider the total current draw for all loudspeakers on the circuit, including the first loudspeaker (Table 1).

### AC Loop Output (Gray)

The gray AC Loop Output connector allows multiple ULTRA-X20/22/23 to be looped and powered from a single power source. The 3-conductor powerCON 20 is rated at 20 A and uses a locking connector that prevents accidental disconnections. For applications that require multiple ULTRA-X20/22/23, connect the AC Loop Output of the first loudspeaker to the AC Input of the second loudspeaker, and so forth.

The maximum number of loudspeakers that can be looped from the AC Loop Output connector is determined by the voltage of the power source, the current draw of the looped loudspeakers, the circuit breaker rating, and the rating of the AC power cable connected to the first ULTRA-X20/22/23 loudspeaker (Table 1).

**Table 1: Maximum ULTRA-X20/22/23s that Can Be Looped with AC Power**

Circuit Breaker/ Connector Rating	115 V AC	230 V AC	100 V AC
15 A	10 looped (11 total)	20 looped (21 total)	8 looped (9 total)
20 A	16 looped (17 total)	29 looped (30 total)	12 looped (13 total)

**NOTE:** Current draw for ULTRA-X20/22/23 is dynamic and fluctuates as operating levels change. The indicated number of loudspeakers that can be looped assumes that operating levels are normal and not such that loudspeakers are constantly limiting.

ULTRA-X20/22/23 ships with a gray powerCON 20 cable mount connector, rated at 20 A, for assembling AC looping cables. Assembled 1-meter AC looping cables are also available from Meyer Sound.

### WIRING AC POWER CABLES

ULTRA-X20/22/23 ships with a gray powerCON 20 cable mount connector, rated at 20 A, for assembling AC looping cables (Figure 6). The pins on the powerCON 20 cable mount connector are labeled as follows:

- L (Line)
- N (Neutral)
- PE (Protective Earth or Ground)

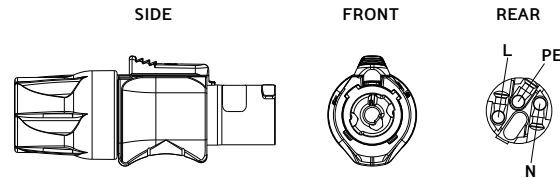


Figure 6: powerCON 20 Cable Mount Connector

How AC power cables are wired is determined by the type of AC power distribution system used (see “AC Power Distribution” on page 7). When wiring AC power cables for single-line systems, use one of the wiring schemes shown in Figure 7 and described in Table 2:

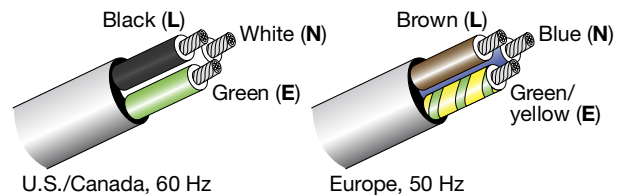


Figure 7: AC Wiring Scheme

**Table 2: AC Wiring Scheme**

Wire Color		Attach to the Following Terminal
U.S. / Canada 60 Hz	European 50 Hz	
Black	Brown	Hot or live (L)
White	Blue	Neutral (N)
Green	Green and Yellow	Protective earth / ground (E or PE)

**CAUTION:** When wiring AC power cables and distribution systems, it is important to preserve AC line polarity and connect the earth ground at both ends of the cable. ULTRA-X20/22/23 requires a grounded connection. Always use a grounded outlet and plug. It is extremely important that the system be properly grounded to operate safely and properly. Do not ground-lift the AC cable.


## VOLTAGE REQUIREMENTS

ULTRA-X20/22/23 operates as intended when receiving AC voltage within the following range:

- 90–264 V AC, 50–60 Hz

If the voltage drops below 90 V, the loudspeaker uses stored power to continue operating temporarily; the loudspeaker powers off if the voltage does not return to its operating range.

If the voltage rises above 275 V, the power supply could become damaged.

 **CAUTION:** The power source for the ULTRA-X20/22/23 should always operate within the required operating range, at least a few volts from the upper and lower limits. This approach ensures that AC voltage variations from the service entry—or peak voltage drops due to cable runs—will not cause the loudspeaker’s amplifier to cycle on and off or cause damage to the power supply.

## CURRENT REQUIREMENTS

Current draw for loudspeakers is dynamic and fluctuates as operating levels change. Because different cables and circuit breakers heat up at varying rates, it is important to understand the following types of current ratings and how they affect circuit breaker and cable specifications.

- **Idle Current** — The maximum rms current during idle periods.
- **Maximum Long-Term Continuous Current** — The maximum rms current during a period of at least 10 seconds. The maximum long-term continuous current is used to calculate temperature increases for cables and to ensure that the size and gauge of each cable conforms to electrical code standards. This current rating is also used to select appropriately rated, slow-reacting thermal breakers, which are recommended for loudspeaker power distribution. In addition, the maximum long-term continuous current can be used to calculate the AC looping capability for ULTRA-X20/22/23 loudspeakers.

- **Burst Current** — The maximum rms current during a period of around 1 second. The burst current is used as a rating for magnetic breakers. It is also used for calculating the peak voltage drop in long AC cable runs according to the following formula:

$$V_{pk} \text{ (drop)} = I_{pk} \times R \text{ (cable total)}$$


- **Maximum Instantaneous Peak Current** — A rating for fast-reacting magnetic breakers.

Use the information in Table 3 to select the appropriate cable gauge and circuit breaker ratings for the system’s operating voltage.

**Table 3: ULTRA-X20/22/23 Current Draw**

Current Draw	115 V AC	230 V AC	100 V AC
Idle	0.15 A rms	0.13 A rms	0.16 A rms
Maximum Long-Term Continuous	0.9 A rms	0.5 A rms	1.1 A rms
Burst	1.6 A rms	0.8 A rms	1.8 A rms
Maximum Instantaneous Peak	3.5 A peak	1.8 A peak	4.1 A peak

The minimum electrical service amperage required by a loudspeaker system is the sum of the maximum long-term continuous current for all loudspeakers. An additional 30 percent above the combined Maximum Long-Term Continuous amperages is recommended to prevent peak voltage drops at the service entry.

 **NOTE:** For best performance, the AC cable voltage drop should not exceed 10 V (10 percent at 115 V and 5 percent at 230 V). This approach ensures that the AC voltage variations from the service entry—or peak voltage drops due to longer cable runs—do not cause the amplifier to cycle on and off.

## INTELLIGENT AC POWER SUPPLY

ULTRA-X20/22/23’s Intelligent AC™ power supply automatically selects the correct operating voltage (allowing the loudspeaker to be used internationally without manually setting voltage switches), eliminates high inrush currents with soft-start power up, suppresses high-voltage transients up to several kilovolts, filters common mode and differential mode radio frequencies (EMI), and sustains operation temporarily during low-voltage periods.

## Powering on the ULTRA-X20/22/23

When powering on the ULTRA-X20/22/23 loudspeaker, the following startup events take place over several seconds.

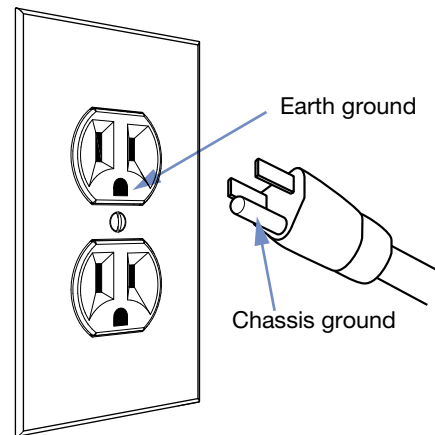
1. Audio output is muted.
2. Voltage is detected and the power supply mode is automatically adjusted as necessary.
3. The power supply ramps up.
4. On the user panel, the Limit and On/Status LED flashes multiple colors successively.
5. The Limit and On/Status LED turns solid green, indicating the loudspeaker is unmuted and ready to output audio.

**CAUTION:** If the Limit and On/Status LED does not turn solid green, or the ULTRA-X20/22/23 does not output audio after 10 seconds, remove AC power immediately and verify that the voltage is within the required range. If the problem persists, contact Meyer Sound Technical Support.

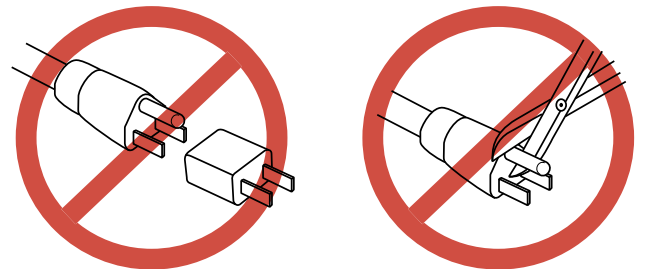
## ELECTRICAL SAFETY GUIDELINES

Make sure to observe the following important electrical and safety guidelines.

- The powerCON 20 connector should not be engaged or disengaged when under load or energized. Either de-energize or disconnect the other end of the cable.
- ULTRA-X20/22/23 requires a grounded outlet. Always use a grounded outlet and plug.



- Do not use a ground-lifting adapter or cut the AC cable ground pin.



- Do not exceed the current capability of the 20 A AC Input connector for the loudspeaker. When looping loudspeakers, consider the total current draw for all loudspeakers on the circuit, including the first loudspeaker.
- Make sure the AC power cable for the loudspeaker has the appropriate power plug (on the other end) for the area in which you will operate the loudspeaker. In addition, the AC power cable must be rated for the total current draw of all loudspeakers looped from the power source.
- Do not operate the unit if the power cable is frayed or broken.
- Keep all liquids away from ULTRA-X20/22/23 loudspeakers to avoid hazards from electrical shock.



## AMPLIFICATION AND AUDIO CONNECTORS

The ULTRA-X20/22/23 drivers are powered by a proprietary three-channel, open-loop, class D amplifier. The audio signal is processed with electronic crossover, correction filters for flat phase and frequency responses, and by driver protection circuitry. Each channel has peak and rms limiters that prevent driver over-excursion and regulate voice coil temperatures.

### TRUPOWER LIMITING

The ULTRA-X20/22/23 employs Meyer Sound’s advanced TruPower® limiting. Conventional limiters assume a constant driver impedance and set the limiting threshold by measuring voltage alone. This method is inaccurate, because driver impedances change as frequency content in the source material changes, and as thermal values for the loudspeaker’s voice coil and magnet vary. Consequently, conventional limiters often begin limiting prematurely, which reduces system headroom and dynamic range.

In contrast, TruPower limiting anticipates varying driver impedances by measuring both current and voltage to compute the actual power dissipation in the voice coil. This approach improves performance, both before and during limiting, by allowing the driver to produce the maximum SPL across its entire frequency range, while also retaining signal peaks. TruPower limiting also eliminates power compression at high levels over lengthy periods, which helps regulate voice coil temperatures, thereby extending the life of the driver.

### ULTRA-X20/22/23 ANALOG VERSION USER PANEL

The ULTRA-X20/22/23 Analog Version user panel (Figure 8) includes XLR Input and Loop output connectors for audio, a Limit and On/Status LED, and optional RMS connectors and controls (see “RMS Remote Monitoring System” on page 33).

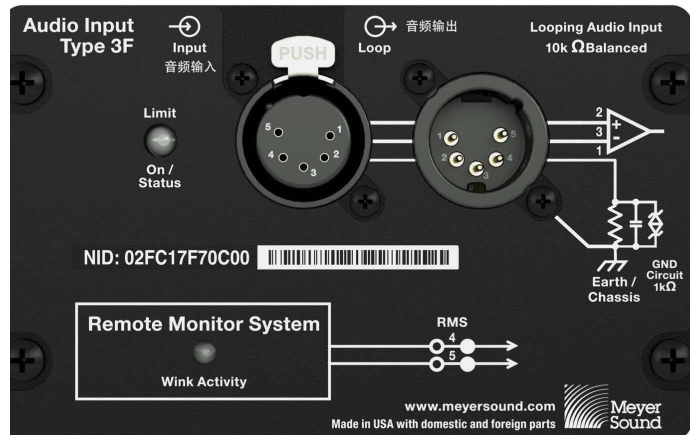



Figure 8: ULTRA-X20/22/23 User Panel (5-pin XLR and optional RMS)

### Audio Connectors

ULTRA-X20/22/23 is available with XLR 5-pin (Figure 9) or 3-pin connectors (Figure 10) for audio Input and audio Loop output. XLR 5-pin connectors accommodate both balanced audio and RMS signals.

 **NOTE:** The 5-pin XLR connector option is not available for weather-protected models.


 **NOTE:** Weather-protected models only are equipped with 3-pin XLR TOP (Total Outdoor Protection) connectors (Figure 11 on page 15).



Figure 9: XLR 5-Pin Audio Connectors, Input and Loop Output




Figure 10: XLR 3-Pin Audio Connectors, Input and Loop Output


### Audio Input (XLR 3-Pin or 5-Pin Female)

The XLR 3-pin or 5-pin female Input connector accepts balanced audio signals with an input impedance of 10 kΩ. The connector uses the following wiring scheme:

- **Pin 1** — 1 kΩ to chassis and earth ground (ESD clamped)
- **Pin 2** — Audio (+)
- **Pin 3** — Audio (–)
- **Pin 4** — RMS (polarity insensitive)
- **Pin 5** — RMS (polarity insensitive)
- **Case** — Earth (AC) ground and chassis


 **NOTE:** Pins 4 and 5 (RMS) are included only with XLR 5-pin connectors.

Pins 2 and 3 carry the input as a differential signal. Pin 1 is connected to earth through a 1 kΩ, 1000 pF, 15 V clamped network. This circuitry provides virtual ground lift for audio frequencies while allowing unwanted signals to bleed to ground. Make sure to use balanced XLR audio cables with pins 1–3 connected on both ends. Telescopic grounding is not recommended and shorting an input connector pin to the case may cause a ground loop, resulting in hum.

 **TIP:** If the loudspeaker produces unwanted noise or hiss, disconnect its input cable. If the noise stops, there is most likely nothing wrong with the loudspeaker. To locate the source of the noise, check the source audio, AC power, and electrical ground.

### Audio Loop Output (XLR 3-Pin or 5-Pin Male)


The XLR 3-pin or 5-pin male Loop output connector allows multiple loudspeakers to be looped from a single audio source. The Loop output connector uses the same wiring scheme as the Input connector (see “Audio Input (XLR 3-Pin or 5-Pin Female)” on page 14). For applications that require multiple ULTRA-X20/22/23, connect the Loop output of the first loudspeaker to the Input of the second loudspeaker, and so forth.


 **NOTE:** The Loop output connector is wired in parallel to the Input connector and transmits the unbuffered source signal even when the loudspeaker is powered off.


### Calculating Load Impedance for Looped Audio Signals

To avoid distortion when looping multiple loudspeakers, make sure the source device can drive the total load impedance of the looped loudspeakers. In addition, the source device must be capable of delivering approximately 20 dBV (10 V rms into 600 Ω) to yield the maximum SPL over the operating bandwidth of the loudspeakers.

To calculate the load impedance for the looped loudspeakers, divide 10 kΩ (the input impedance for a single loudspeaker) by the number of looped loudspeakers. For example, the load impedance for 10 ULTRA-X20/22/23 is 1000 Ω (10 kΩ/ 10). To drive this number of looped loudspeakers, the source device should have an output impedance of 100 Ω or less. This same rule applies when looping ULTRA-X20/22/23 with other Meyer Sound self-powered loudspeakers.

 **NOTE:** Most source devices are capable of driving loads no less than 10 times their output impedance.

 **TIP:** Audio outputs from Meyer Sound’s loudspeaker GALAXY Network Platform have an output impedance of 50 ohms. Each output can drive up to 20 Meyer Sound (10 kΩ) loudspeakers without distortion.

 **CAUTION:** Make sure that all cabling for looped loudspeakers is wired correctly (Pin 1 to Pin 1, Pin 2 to Pin 2, and so forth) to prevent the polarity from being reversed. If one or more loudspeakers in a system have reversed polarity, frequency response and coverage will be significantly degraded.

## Weather-Protected Analog Audio Connectors

The weather-protected analog audio units are equipped with 3-pin XLR TOP connectors—a 3-pin female for the audio input and a 3-pin male for the audio loop.

**CAUTION:** Always seal connectors (input or loop) with their attached sealing caps when not in use.

**CAUTION:** This XLR TOP chassis connector is certified for outdoor protection **only** when used in combination with an XLR TOP cable connector or with the sealing cap in place when the chassis connector is not in use.



Figure 11: Weather-protected analog units have 3-pin XLR TOP audio connectors

## Limiting

During normal operation, when ULTRA-X20/22/23 is powered on, the shared Limit and On/Status LED is solid green. The low- and high-frequency drivers for ULTRA-X20/22/23 are powered by separate amplifier channels, each with their own limiter. Limiting activity is indicated by the Limit and On/Status LED illuminating yellow on the user panel. The LED (Figure 12) displays solid yellow for 1 second when the high-frequency channel limits and pulses yellow when the low-frequency channel limits.



Figure 12: ULTRA-X20/22/23 Analog Version Limit and On/Status LED

When limiting is engaged for a channel, its gain is reduced. The limiter protects the drivers and prevents signal peaks from causing excessive distortion in the amplifier, thereby preserving headroom and maintaining a smooth frequency response at high levels. When source levels return to normal below the limiter's threshold, the LED turns green and limiting ceases.

The ULTRA-X20/22/23 performs within its acoustical specifications at normal temperatures when the Limit and On/Status LED is green, or when limiting is not continuous. During continuous limiting, the loudspeaker is nearing its operational limits, resulting in the following effects:

- Increases to the input level have no effect.
- Distortion increases due to clipping and nonlinear driver operation.
- The drivers are subjected to excessive heat and excursion, which compromises their life span and may eventually damage them.

**CAUTION:** The Limit and On/Status LED indicates when a safe, optimum level is exceeded. If an ULTRA-X20/22/23 loudspeaker system begins to limit before reaching the desired SPL, consider adding more units to the system.

## On/Status

During normal operation, when ULTRA-X20/22/23 is powered on, the Limit and On/Status LED is solid green.

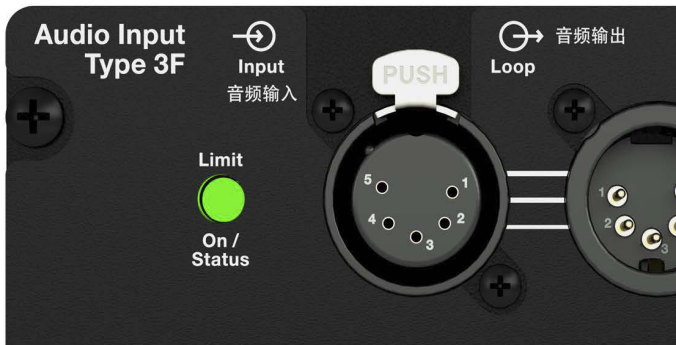


Figure 13: ULTRA-X20/22/23 Limit and On/Status LED

If the loudspeaker encounters a hardware fault, or the unit begins to overheat, the LED flashes red. In some instances, the loudspeaker will continue to output audio while the LED flashes red, though with a reduction in the limiter threshold and acoustic output to protect the loudspeaker.

If a loudspeaker is overheating (for RMS-equipped loudspeakers, this situation may be verified in Compass RMS), a reduction in SPL may be necessary. If after a reduction in SPL and an appropriate cooling period the Limit and On/Status LED continues to flash red (does not return to solid green), contact Meyer Sound Technical Support.

If the Limit and On/Status LED flashes red and the loudspeaker does not output audio, contact Meyer Sound Technical Support immediately.

**CAUTION:** If an ULTRA-X20/22/23 loudspeaker system consistently overheats before reaching the desired SPL, consider adding more units to the system.

**NOTE:** During startup, the Limit and On/Status LED flashes multiple colors successively.

**TIP:** When an ULTRA-X20/22/23 is connected to an RMS network, the Compass RMS software provides additional feedback about the loudspeaker's hardware status and operating temperature (see "RMS Remote Monitoring System" on page 33).

## ULTRA-X20/22/23 DIGITAL USER PANEL

The ULTRA-X20/22/23 Digital user panel (also referred to as the Type 3M Audio Input Module, Figure 14) includes an etherCON TOP (Total Outdoor Protection) for audio input, an Ethernet connectivity LED, an On/Status LED, and a Wink button/LED.



Figure 14: ULTRA-X20/22/23 User Panel (with etherCON TOP)

## Audio Connector

ULTRA-X20/22/23 Digital has an etherCON TOP chassis connector.

**CAUTION:** Always seal the connector with the sealing cap when the connector is not in use.

**CAUTION:** This etherCON chassis connector is certified for outdoor protection **only** when used in combination with an etherCON TOP cable connector or with the sealing cap in place when the chassis connector is not in use.



Figure 15: etherCON TOP Audio Input



## Remote Monitoring

ULTRA-X20/22/23 Digital loudspeakers include Meyer Sound remote monitoring functionality. No additional connections are required. When an ULTRA-X20/22/23 Digital loudspeaker and Compass computer are connected to the same network via an AVB-enabled network switch, the loudspeaker will appear under the Compass Control Software Inventory tab. The ULTRA-X20/22/23 Digital loudspeaker must be allocated to an available audio source channel (Talker) as a Listener.

## Wink Function

Once the ULTRA-X20/22/23 Digital has been configured into a network in Compass Control Software, the icons within the loudspeaker's detail page include a W (Wink) icon. Pressing this icon will turn it green and cause the Wink push button of the associated loudspeaker to illuminate at the center.



Figure 16: ULTRA-X20/22/23 Digital Audio Wink Push Button and LED

Conversely, if the Wink button on the ULTRA-X20/22/23 Digital loudspeaker is pressed, a winking happy face is displayed on the associated loudspeaker page in Compass (Figure 17).

**NOTE:** When pressed and released, the physical Wink button LED toggles between dark and solid green. When the Wink button is pressed and held, the On/Status LED will turn solid red. This is normal.

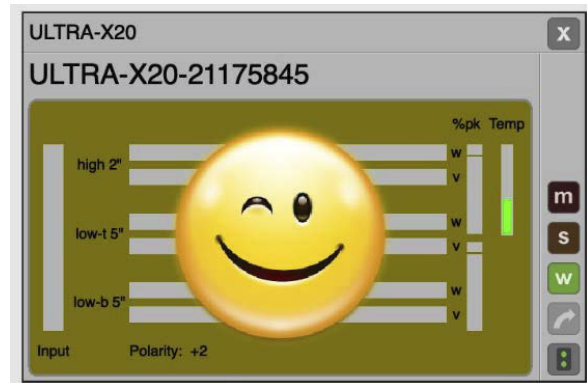


Figure 17: Result of Pressing Wink Button on Rear of Loudspeaker

These features facilitate matching of the physical loudspeaker to the Compass control software loudspeaker listings.

## Ethernet/Network Connectivity LED

The Ethernet connectivity LED (Figure 18, right) turns solid yellow when a 100 Mb link is established; otherwise it is off.

## On/Status

During normal operation, when the ULTRA-X20/22/23 Digital is powered on, the On/Status LED is solid green.

The On/Status LED works in an identical manner to the analog version. It indicates limiting activity by turning yellow (see “Limiting” on page 15) and fault status with red (see “On/Status” on page 16).



Figure 18: ULTRA-X20/22/23 On/Status LED and Ethernet LED (right)

**TIP:** When an ULTRA-X20/22/23 Digital and a computer running the Compass Control Software are connected to the same network, the Compass software provides additional feedback about the loudspeaker's hardware status and operating temperature (see “RMS Remote Monitoring System” on page 33).


## CONNECTING TO THE ULTRA-X20/22/23 DIGITAL VERSION


A detailed Set Up Guide for the Type 3M Audio Input Module is available at [meyersound.com/documents](https://meyersound.com/documents).

Help videos are also available at [meyersound.com/videos](https://meyersound.com/videos).

## AMPLIFIER COOLING SYSTEM

The ULTRA-X20/22/23 loudspeaker is convection cooled. The amplifier's heat sink provides natural convection cooling from the air flowing near its fins.

 **CAUTION:** To keep ULTRA-X20/22/23 from overheating, allow at least 3 inches behind the loudspeaker for proper ventilation.

 **CAUTION:** The ULTRA-X20/22/23 heat sink can reach temperatures up to 80° C (176° F) during extreme operation. Wait 15 minutes for the unit to cool before touching.

## ADDING LOW FREQUENCY CONTROL

An ULTRA-X20/22/23 loudspeaker system can be deployed with Meyer Sound self-powered low frequency control elements (see Table 4). These subwoofers achieve very low frequency responses and extend the system response appreciably, increasing the overall acoustic power of the system in the lowest frequencies.

The ideal ratio of ULTRA-X20/22/23 loudspeakers to low frequency control element depends on the following variables:

- Subwoofer model
- System configuration
- Frequency content of source material
- Headroom required for low frequencies

For most applications, the ratios in Table 4 should yield good results.

**Table 4: Recommended Meyer Sound Subwoofer**

Subwoofer	Frequency Response	Recommended Ratio (Number of ULTRA-X20/22/23s per Subwoofer)
USW-112P	36–125 Hz $\pm 4$ dB	1:1 for most applications
USW-210P	32–123 Hz $\pm 4$ dB	1:1 for most applications 1:2 for applications requiring more low end
750-LFC	37–110 Hz $\pm 4$ dB	1:1 for most applications
900-LFC	32–115 Hz $\pm 4$ dB	2:1 for most applications 1:1 for applications requiring extreme low end

### ADDING SUBWOOFERS BY DAISY-CHAINING

Full-range signals can be connected directly to Meyer Sound self-powered loudspeakers because the loudspeakers have built-in active crossovers. Subwoofers can be added to an ULTRA-X20/22/23 system by simply daisy-chaining them to the ULTRA-X20/22/23 loudspeakers.

To daisy-chain the suggested number of ULTRA-X20/22/23 loudspeakers for your subwoofer (see Table 1).

1. Connect the source signal to the Input of the first ULTRA-X20/22/23, then connect the Loop output of the first ULTRA-X20/22/23 to the Input of the second ULTRA-X20/22/23 (and so forth).
2. Connect the Loop output of the last ULTRA-X20/22/23 in the chain to the subwoofer Input.

When ULTRA-X20/22/23 loudspeakers are coplanar, or they are very close together, about four to six feet like in the case of pole mounting, the phase response will work well in the area of interaction and the result will be a fairly flat frequency response. However, the response will show an increase in the 60–200 Hz range where the response of the loudspeakers overlaps.



**NOTE:** If the subwoofer's Limit LEDs begin to light before reaching the required SPL, consider adding more subwoofers to meet the SPL requirements without exposing the drivers to excessive heat and excursion.

### USING A PROCESSOR

In larger systems when individual control for the ULTRA-X20/22/23 and subwoofers are needed or desired, if the ULTRA-X20/22/23 loudspeakers and subwoofer are more than six feet apart, or if a delay is required between them, use a measurement system to determine appropriate delay and polarity settings.



**CAUTION:** Make sure the source signal is sufficient to drive the total load impedance of the daisy-chained loudspeakers (see “Audio Loop Output (XLR 3-Pin or 5-Pin Male)” on page 14).



**TIP:** MAPP can be used to accurately predict the appropriate loudspeaker deployment and subwoofer integration for loudspeaker systems, complete with coverage data, system delay and equalization settings, rigging information, and detailed design illustrations. For more information, see “MAPP System Design Tool” on page 35.



## QUICKFLY RIGGING

The ULTRA-X20, ULTRA-X22 AND ULTRA-X23 loudspeakers are compatible with Meyer Sound's QuickFly system, a comprehensive collection of custom-designed rigging, flying, and mounting options. Comprised of rugged, reliable, and easy-to-configure components, QuickFly enables deployment of ULTRA-X20/22/23 loudspeakers as either individual loudspeakers or as two-speaker clusters at precise angles to take full advantage of their directional components.

### Important Safety Considerations!

When installing Meyer Sound loudspeakers, the following precautions should always be observed:

- All Meyer Sound products must be used in accordance with local, state, federal, and industry regulations. It is the owner's and user's responsibility to evaluate the reliability of any rigging method for their application. Rigging should only be carried out by experienced professionals.
- Use mounting and rigging hardware that has been rated to meet or exceed the weight being hung.
- Make sure to attach mounting hardware to the building's structural components (studs or joists), and not just to the wall surface. Verify that the building's structure and the anchors used for the installation will safely support the total weight of the mounted loudspeakers.
- Use mounting hardware appropriate for the surface where the loudspeaker will be installed.
- Make sure bolts and eye bolts are tightened securely. Meyer Sound recommends using medium strength blue thread locker on eye bolt threads and safety cables.
- Inspect mounting and rigging hardware regularly. Immediately replace any worn or damaged components.

### RIGGING POINTS

The top and bottom aluminum plates for the ULTRA-X20/22/23 cabinet include rigging points that provide two M8 x 1.25 threaded holes (on each end) for easy connection to QuickFly rigging and third-party mounting options.

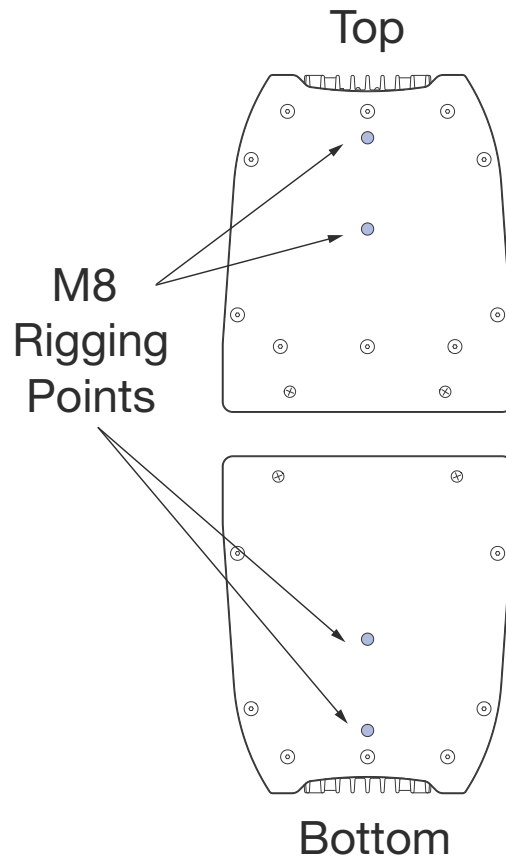


Figure 19: ULTRA-X20/22/23 Rigging Points

## ULTRA-X20/22/23 RIGGING OPTIONAL ACCESSORIES

Meyer Sound offers a number of rigging options that facilitate a wide variety of configurations (Table 5).

**Table 5: ULTRA-X20/22/23 Rigging Options**

Model	Features
<b>MPK-POLE Adjustable Pole Mount Kit</b> (PN 40.010.973.01)	Adjustable length 927–1524 mm (36.5–60 in) pole with assisted lift. Lower shaft fits 35 mm cups or use the removable M20 threaded lug for added stability. Upper shaft includes a PAS-M20 Adapter Sleeve to fit loudspeakers with 35 mm and M20 internal pole mounts onto a 35 mm speaker stand and the PAS-M8 Adapter Sleeve to fit loudspeakers with M8 rigging points. (Can also buy the PAS-M20 and PAS-M8 Adapter Sleeves separately). Additional 35 mm to 38 mm (1.5 in) adapter for bottom of pole included.
<b>PAS-M8 Adapter Sleeve M8 (35 MM Pole)</b> (PN.40.010.975.01)	The PAS-M8 Adapter Sleeve allows the user to connect a 35 mm pole to the ULTRA-X20 M8 rig nuts on the top/bottom of the loudspeaker.
<b>MYA-X20 Mounting Yoke Kit</b> (PN 40.297.450.01)	The MYA-X20 Yoke suspends a single ULTRA-X20/22/23 loudspeaker and supports a wide range of horizontal and vertical adjustments. The yoke attaches to the top and bottom of the loudspeaker using two included M8 bolts/washers. The kit also includes two M8 knobs/washers. The yoke may also be mounted on a 35 mm pole using the optional PAS-M8 Adapter Sleeve to facilitate easy panning and tilting. (An additional M8 nut and washer are required for this application.)
<b>MUB-X20 U-Bracket Kit</b> (PN 40.297.454.01)	The MUB ULTRA-X20 U-Bracket allows a single ULTRA-X20/22/23 loudspeaker to be mounted to a wall (in either vertical or horizontal orientations), to the ceiling or onto the floor. The kit includes two M8 bolts/washers and two M8 knobs/washers.
<b>MTC-X20 Top Channel Kit</b> (PN 40.297.430.01)	The MTC-X20 Top Channel kit includes a pinnable link in a channel that mounts directly to the top of the ULTRA-X20/22/23 rig nuts and supports pick-up of up to two ULTRA-X20/22/23 loudspeakers from a single point using the two included lock pins and 3/8-inch shackle. (Mounting two loudspeakers requires three MTC-X20 Top Channel Kits—one on top of the upper loudspeaker and two to connect the lower loudspeaker to the upper.) The kit includes two M8 socket head screws for attaching the channel to the loudspeaker.

## BASIC EYE BOLT RIGGING

The ULTRA-X20 loudspeaker can be suspended simply by using one or two M8 eye bolts. The use of two eye bolts provides the added flexibility of aiming and tilting the loudspeaker for targeted coverage.

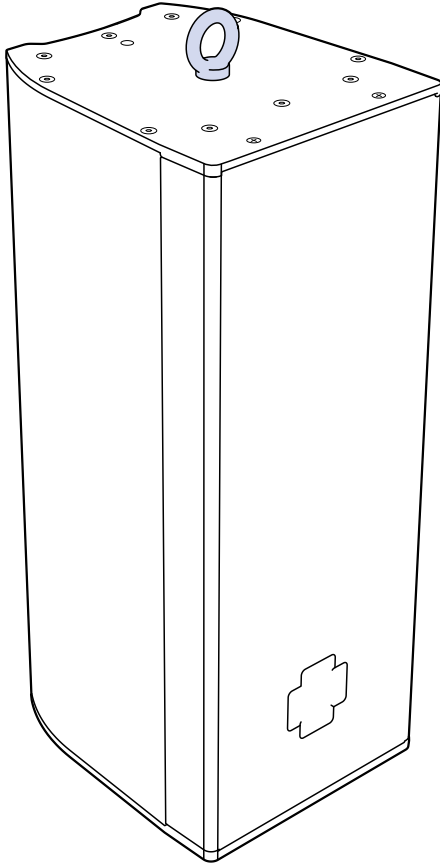


Figure 20: ULTRA-X20 with One Eye Bolt

## POLE-MOUNTING THE ULTRA-X20

The MPK-POLE-35MM-M20 (PN 40.010.973.01) provides an easy and efficient way to mount the ULTRA-X20/22/23 on top of a USW-112P, 750-LFC or 900-LFC.

The MPK-POLE-35MM-M20 features all steel shafts that telescope from 36.5–60 inches and employs a secure knob to hold it in a specific position. The upper shaft includes the removable PAS-M20-35MM with M20 Slug Adapter Sleeve as well as the PAS-M8 Adapter Sleeve.

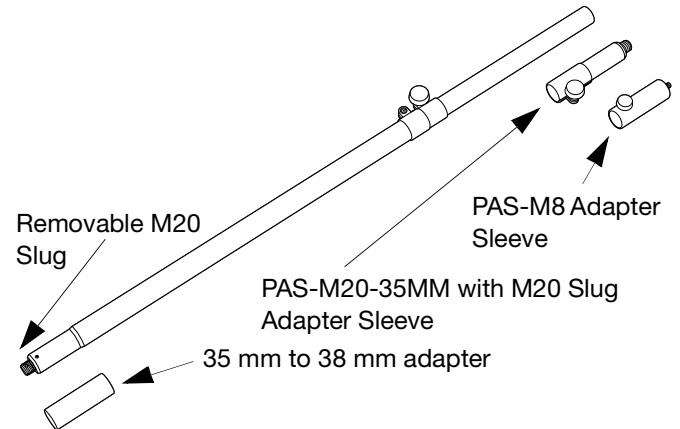


Figure 21: MPK-POLE kit

The MPK-POLE features a lift assist that provides approximately 40 lb of internal gas cylinder pneumatic lift. The lower end of the pole is 35 mm in diameter and has an M20 threaded lug for stability that can be removed if necessary. In addition, the MPK-POLE-35MM-M20 kit includes an adapter for converting the bottom diameter from 35 mm to 38 mm.

To remove the M20 threaded lug:

1. Locate the set screws on the Removable M20 Slug side of the pole.
2. Loosen the set screws using a 2.5 mm hex wrench. Do not loosen so far that the screws fall out of the pole and are lost (Figure 22).

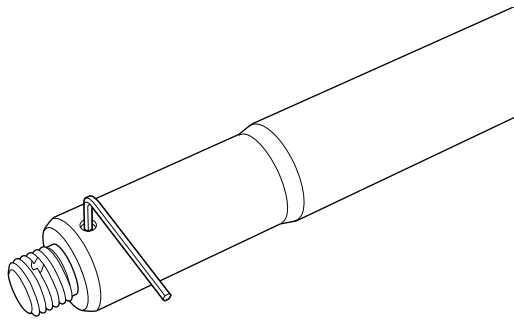


Figure 22: Using Hex Wrench to Loosen M20 Lug Set Screws

3. Loosen the M20 lug by rotating counter-clockwise (inserting a screwdriver through the lug can help with this process, see Figure 23) and remove it.

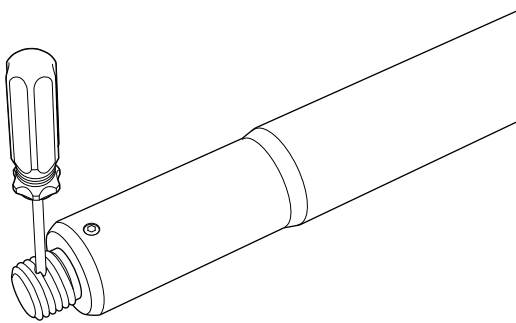


Figure 23: Inserting Screwdriver to Remove M20 Lug

4. Tighten the set screws enough to ensure they will remain in the pole (Figure 24).

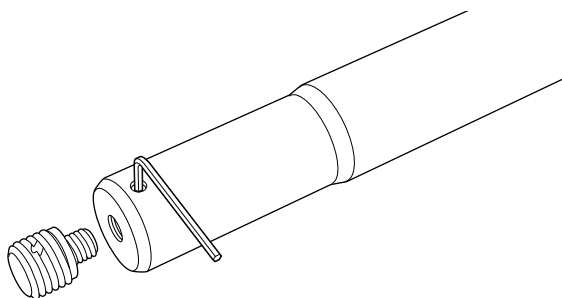


Figure 24: Pole with M20 Lug Removed

The pole can be used without the lug for loudspeakers that have 35 mm cup mounts without M20 threads, or the 35 mm to 38 mm adapter may be slipped onto the bottom for loudspeakers that have 38 mm cups (Figure 25).

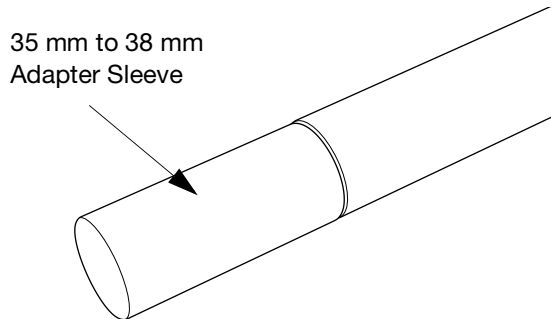


Figure 25: Pole with 35 mm to 38 mm Adapter Sleeve Attached

Meyer Sound recommends that a 750-LFC (or 900-LFC) be upgraded with the 35 mm/M20 internal pole mount cup (PN 40.271.016.02) for a more stable connection (Figure 26). This part is included with the MPK-POLE kit.

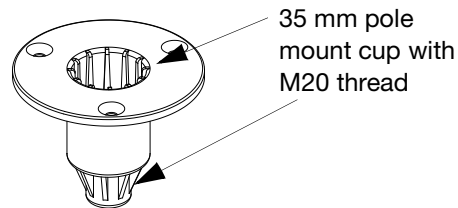


Figure 26: 35 mm/M20 Internal Pole Mount Cup (PN 40.271.016.02)

The PAS-M8 Adapter is designed to securely fit into an M8 rig nut on the bottom of the ULTRA-X20/22/23. The separate knob on the adapter tightens it to the pole. (It can also be secured onto any other standard 35 mm pole.)

**TIP:** Use the PAS-M8 knob to secure the adapter to a pole when packing the pole for travel.

The PAS-M8 may be independently (apart from the pole) threaded into the ULTRA-X20/22/23 (Figure 27), and then the loudspeaker/PAS-M8-35MM Adapter combination mounted onto a pole that is already secured in the subwoofer (Figure 28). The loudspeaker may be aimed horizontally, and the PAS-M8 knob tightened.



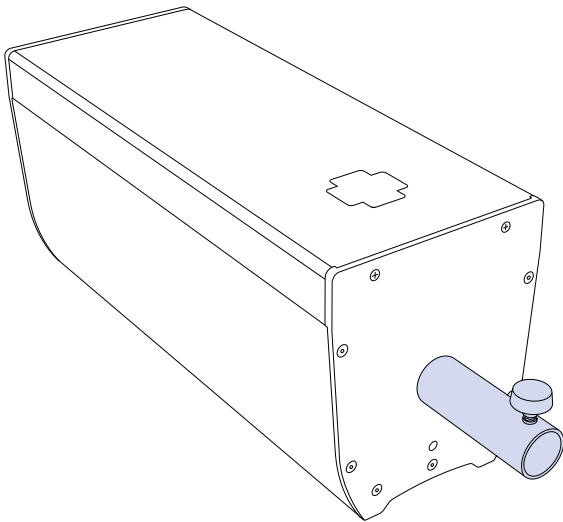


Figure 27: Inserting the PAS-M8 Adapter Sleeve Independently

**CAUTION:** Due to the small footprint and light weight of the USW-112P, to keep it stable, avoid extending the pole to the maximum height. Do not lift the ULTRA-X20 higher than 44 inches from the top of the USW-112P.

**CAUTION:** When using a third party pole, make sure the pole is designed to support the total weight of the ULTRA-X20/22/23 loudspeaker and observe all safety precautions specified by the pole manufacturer

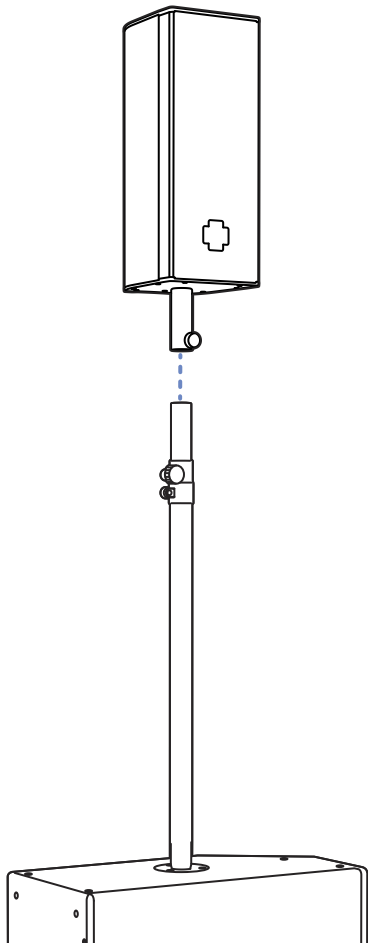


Figure 28: Settling Loudspeaker/Adapter Combination onto Pole

## THE MYA-X20 MOUNTING YOKE

The MYA-X20 mounting yoke (PN 40.297.450.01) suspends a single ULTRA-X20/22/23 loudspeaker and supports a wide range of horizontal and vertical adjustments. The yoke attaches to the top and bottom of the loudspeaker using the top and bottom center M8 threaded hole (Figure 30). The kit includes two M8 bolts/washers and two M8 knobs/washers. The bolts are recommended for fixed installations. A hanging clamp and steel safety cable (not included) are required to suspend the MYA-X20 mounting yoke.

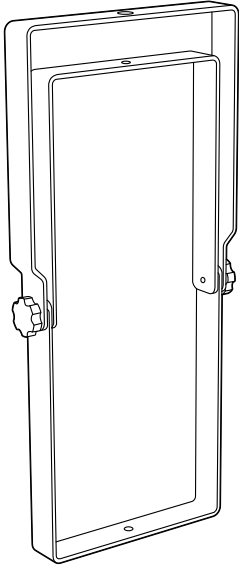


Figure 29: MYA-X20 Mounting Yoke

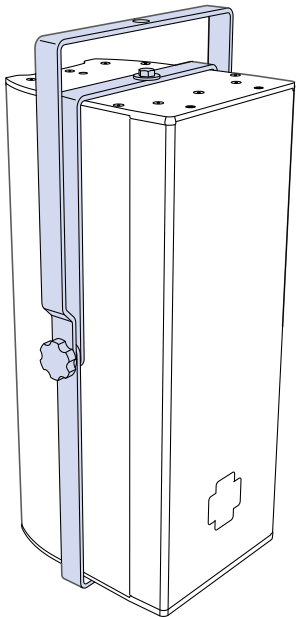


Figure 30: ULTRA-X20 in the MYA-X20 Yoke Mount

**NOTE:** The top bar of MYA-X20 mounting yoke accommodates hanging clamps with standard 1/2-inch or 12 mm bolts.

**CAUTION:** THE MYA-X20 Yoke is rated for a single loudspeaker. Never hang a second loudspeaker or other object underneath.

In addition, the yoke may be mounted onto a 35 mm pole using the optional PAS-M8 Adapter Sleeve to facilitate easy panning and tilting.

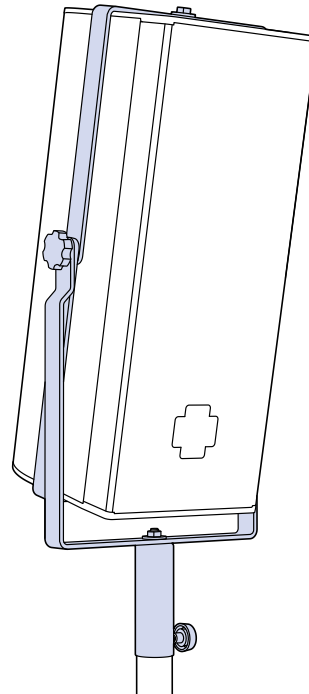


Figure 31: ULTRA-X20 in the MYA-X20 Yoke Mount on Pole using the optional PAS-M8 Adapter Sleeve (M8 nut required)

## THE MUB-X20 U-BRACKET

The MUB-X20 U-Bracket (PN 40.297.454.01) allows a single ULTRA-X20/22/23 loudspeaker to be mounted on walls, ceilings, trusses and stage lips. The U-bracket's adjustment slots allow for adjustment on how close the loudspeaker is located to the mounting surface and at what angle it will be positioned. The MUB-X20 kit includes two M8 bolts with washers and two M8 knobs with washers. The bolts are recommended for fixed installations.

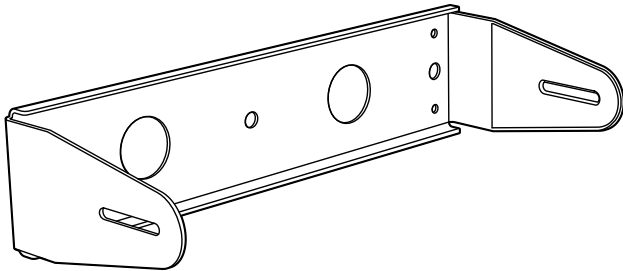


Figure 32: MUB-X20 U-Bracket

One ULTRA-X20 can be safely be mounted with the MUB-X20 U-bracket at a 5:1 safety factor. When mounting an ULTRA-X20 with the MUB-X20 U-bracket, the U-bracket must be secured to the mounting surface with one of the configurations indicated in Table 6.

**Table 6: MUB-X20 Mounting Hole Use**

Hole Location	Safety Factor
1/2-inch center hole	5:1
Two 1/2-inch outer holes	5:1
All four 1/4-inch corner holes	5:1

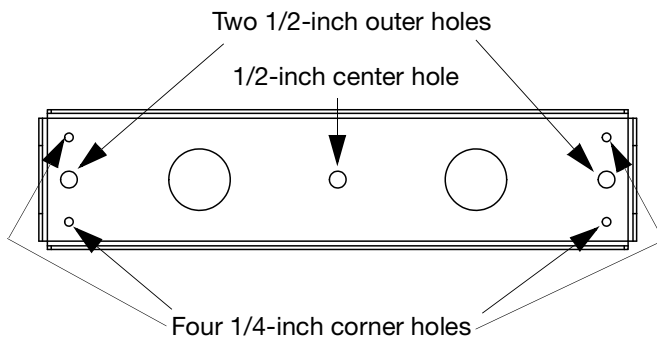


Figure 33: MUB-X20 Mounting Holes

## Wall-Mounting with the MUB-X20

The ULTRA-X20 may be mounted either horizontally or vertically with the MUB-X20

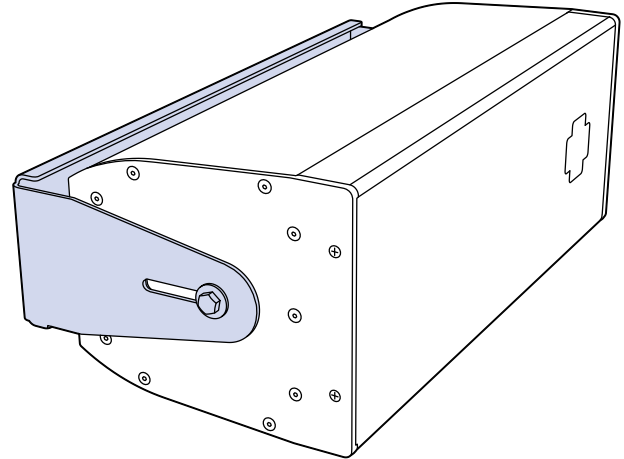


Figure 34: ULTRA-X20 with MUB-X20 for Wall Mount, Horizontal

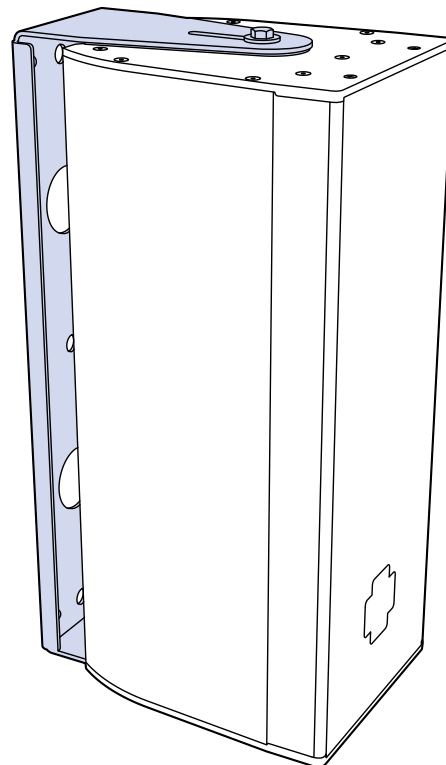


Figure 35: ULTRA-X20 with MUB-X20 for Wall Mount, Vertical

### Ceiling-Mounting with the MUB-X20

The ULTRA-X20 can be mounted on a ceiling, underbalcony, or canopy area with the MUB-X20 U-bracket.

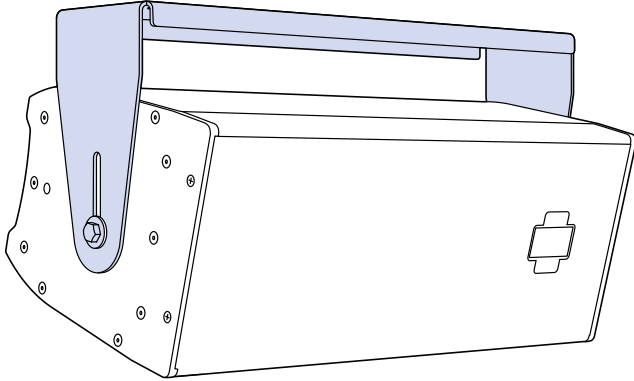


Figure 36: ULTRA-X20 with MUB-X20, Ceiling Mount

### Floor-Mounting with the MUB-X20

The ULTRA-X20 can be mounted to the floor or on a stage lip (for front -fill applications) with the MUB-X20 U-bracket.

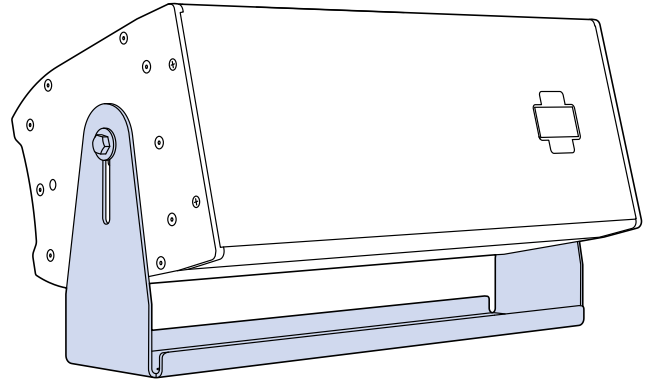


Figure 38: ULTRA-X20 Floor-Mounted using MUB-X20

### Truss-Mounting with the MUB-X20

The 0.55-inch holes in the MUB-X20 support mounting an ULTRA-X20 on a truss using two “C” or “G” hanging clamps (not included in kit).

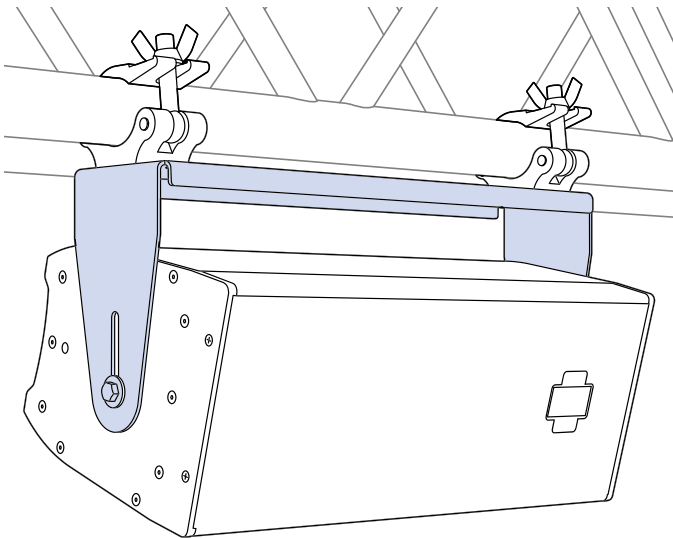


Figure 37: ULTRA-X20 Truss-Mounted using MUB-X20

## THE MTC-X20 TOP CHANNEL KIT

The MTC-X20 Top Channel kit (PN 40.297.430.01) includes a pinnable link in a channel that mounts directly to the ULTRA-X20/22/23 rig nuts. It supports pick-up of two ULTRA-X20/22/23 loudspeakers from a single point using the two included lock pins and 3/8-inch black shackle. The MTC-X20 Top Channel attaches to the speaker with two M8 bolts.

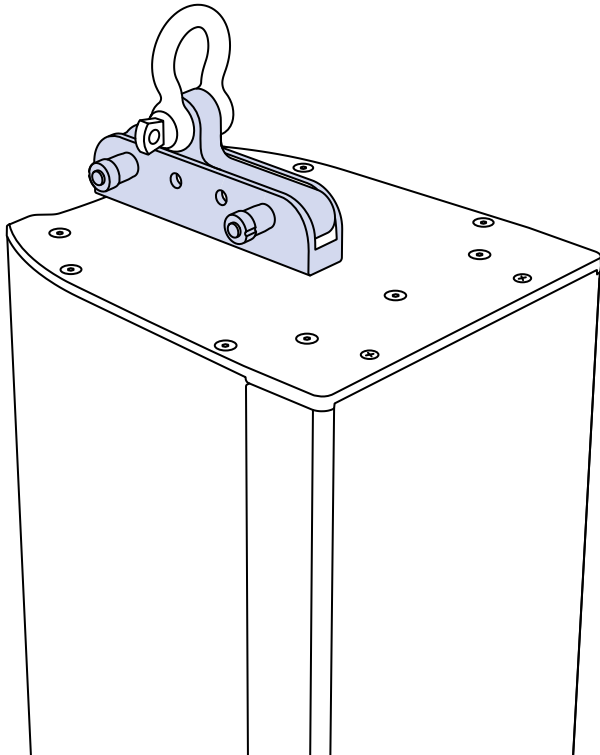


Figure 39: MTC-X20 Top Channel Kit Installed at Top of Cabinet

The versatile configuration of the channel and link, with the ability to slide the pinnable link within the channel, facilitates 13 different top pickup points. This flexibility allows for approximately  $+11^\circ$  to  $-22^\circ$  tilting of a loudspeaker that hangs from a single point (see Table 7).

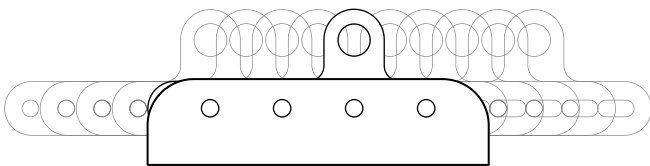


Figure 40: MTC-X20 Pickup Points

Using three versions of this kit allows the user to create a two-loudspeaker configuration with an angle of  $50^\circ$  between top and bottom speakers (Figure 41).

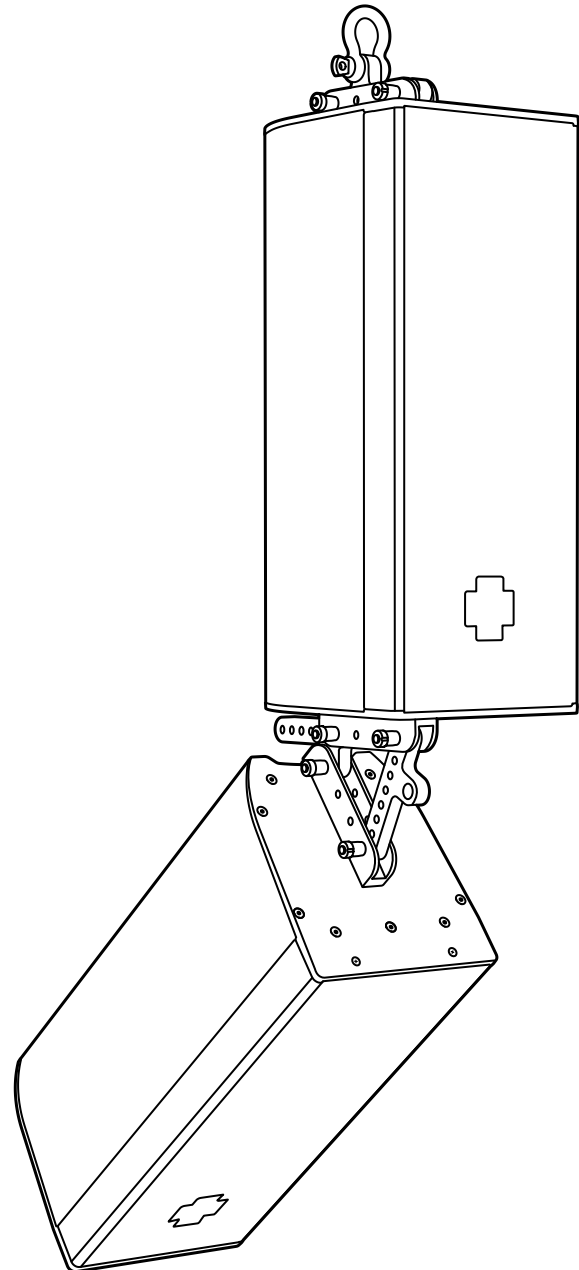
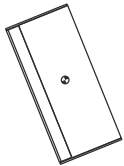
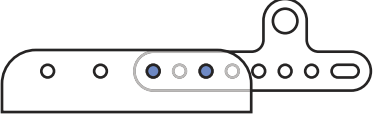
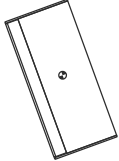
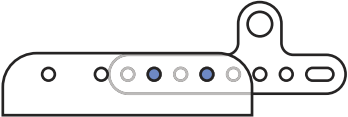
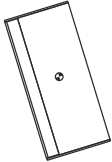
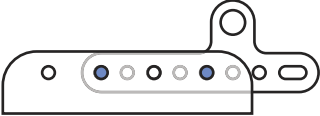
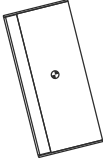
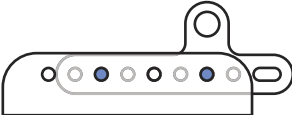
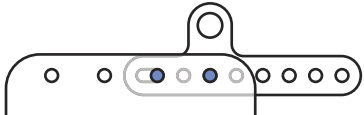
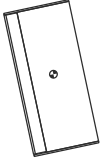
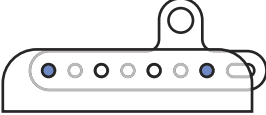
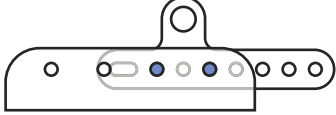
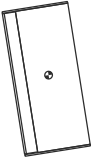
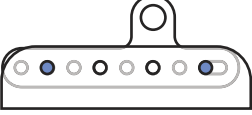
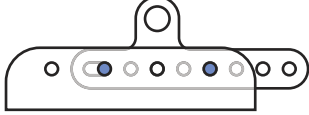
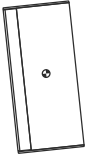
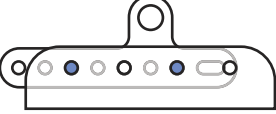
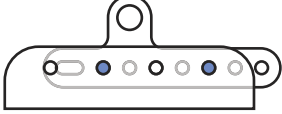


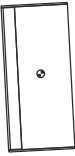
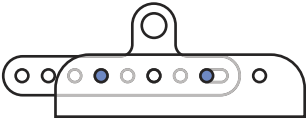
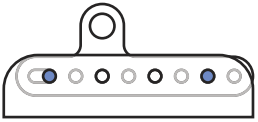

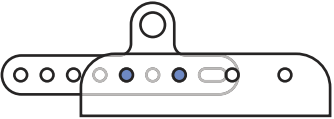
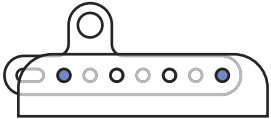

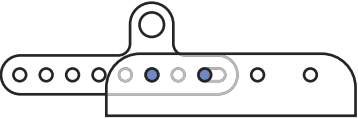
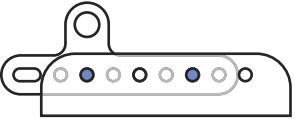

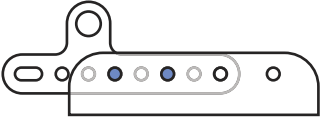
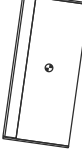
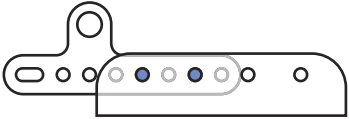
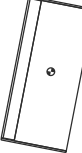
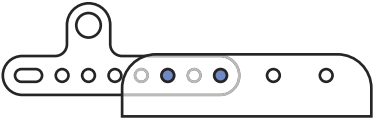
Figure 41: Two MTC-X20 Top Channels linking speakers at a  $50^\circ$  angle with a third MTC-X20 channel on top for pickup point.

## MTC-X20 PIN POSITIONS AND RESULTANT ANGLE TILT FOR SINGLE POINT HANG

Table 7: MTC-X20 Pin Positions and Resultant Angles for Single Point Hang

Degree Tilt	Speaker Side View	MTC-X20 Hole Position	Alternate Hole Position
22° Downtilt			
20° Downtilt			
17° Downtilt			
14° Downtilt			
12° Downtilt			
9° Downtilt			
6° Downtilt			

**Table 7: MTC-X20 Pin Positions and Resultant Angles for Single Point Hang (Continued)**

Degree Tilt	Speaker Side View	MTC-X20 Hole Position	Alternate Hole Position
3° Downtilt			
0°			
3° Uptilt			
5° Uptilt			
8° Uptilt			
11° Uptilt			

### MOUNTING THE ULTRA-X20/22/23 UNDER THE ULTRA-X40/42

It is possible to mount an ULTRA-X20/22/23 beneath an ULTRA-X40/42 using one MTC-X40 and one MTC-X20. Four configurations are possible, as shown in Figure 42.

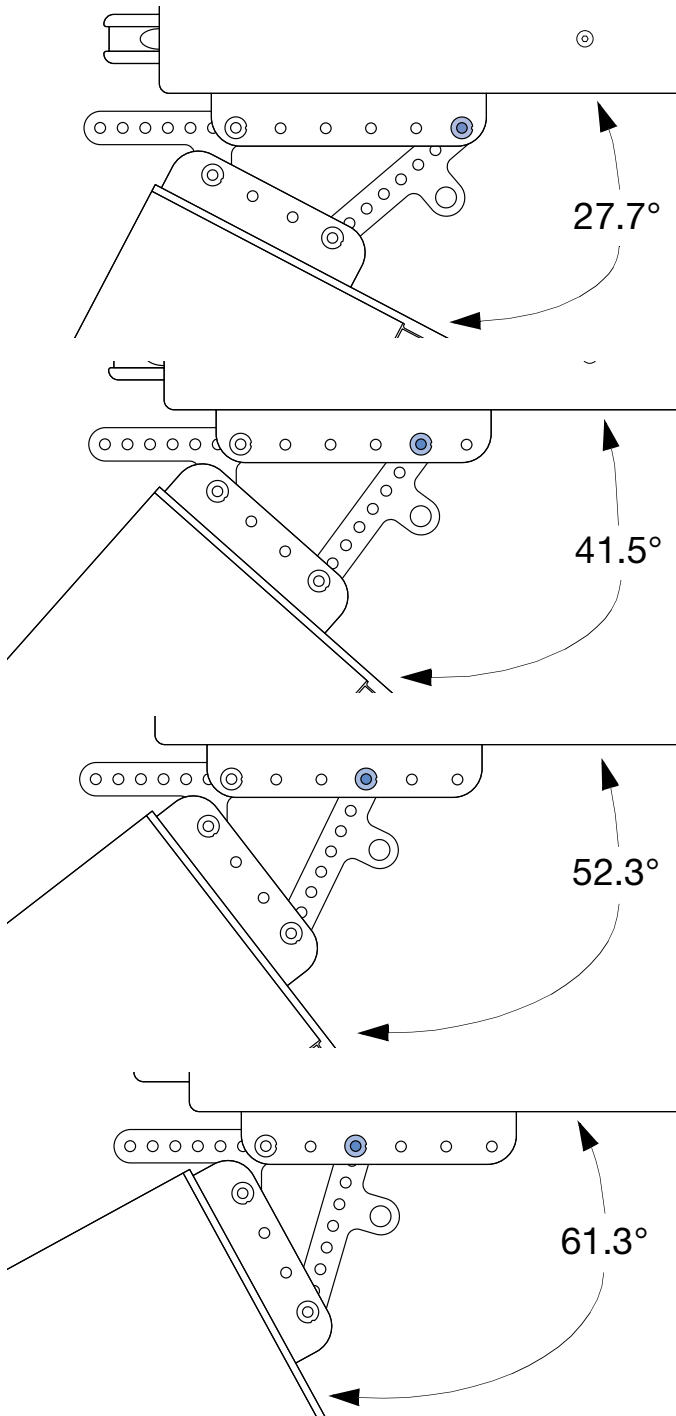


Figure 42: Allowed Mounting Positions for ULTRA-X20 Beneath ULTRA-X40 using one MTC-X40 and one MTC-X20

### USING THE HEAT SINK MOUNTING HOLES

The ULTRA-X20/22/23 heat sink on the rear of the loudspeaker also has four M6 x 1-inch mounting holes. These four mounting holes may be used with third party wall mounts to hang a single loudspeaker.

#### M6 Mounting Points

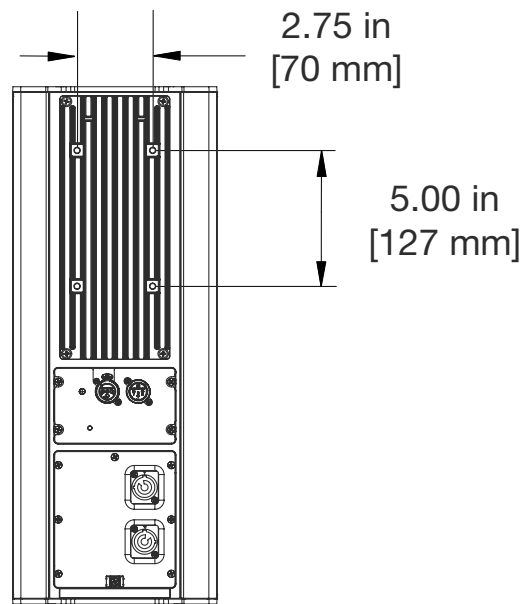


Figure 43: Dimensions for Spacing of Heat Sink Mounting Holes

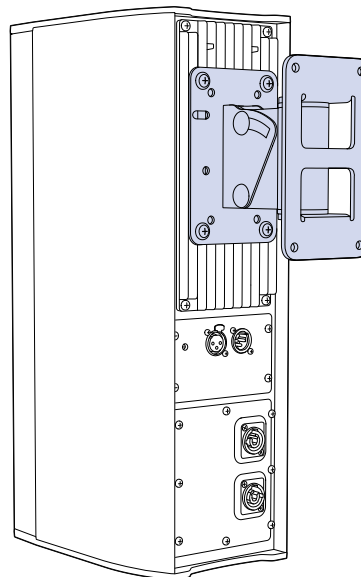


Figure 44: Using the Heat Sink Mounting Holes with Example Third-Party Bracket




## RMS REMOTE MONITORING SYSTEM

### MONITORING THE ULTRA-X20/22/23 ANALOG LOUDSPEAKER (OPTIONAL RMS MODULE)


The ULTRA-X20/22/23 loudspeaker analog version optionally includes an RMS remote monitoring system module, allowing it to be connected to an RMS network. RMS reports, in real time, the status and power usage of multiple Meyer Sound loudspeakers from a Mac® or Windows®-based computer. The RMsServer™ communicates with Meyer Sound loudspeakers equipped with RMS modules. RMsServer is a compact, Ethernet-based hardware unit with two FT-10 RMS data ports. RMsServer stores system configurations internally, eliminating most manual data entry. Systems can be monitored from a computer at front-of-house or backstage, or from a laptop anywhere within the venue over WiFi.

 **NOTE:** For the latest RMS system requirements, visit [meyersound.com](http://meyersound.com).

 **NOTE:** RMS does not control AC power.

### MONITORING THE ULTRA-X20/22/23 DIGITAL LOUDSPEAKER

ULTRA-X20/22/23 Digital loudspeakers include Meyer Sound remote monitoring functionality. No additional connections are required. When an ULTRA-X20/22/23 Digital loudspeaker and Compass computer are connected to the same network via an AVB-enabled network switch, the loudspeaker will appear under the Compass Control Software Inventory tab. The ULTRA-X20/22/23 Digital loudspeaker must be allocated to an available audio source channel (Talker) as a Listener.

 **NOTE:** The Type 3M Audio Input Module Set Up Guide is available at: [meyersound.com/documents](http://meyersound.com/documents).

Help videos are also available at: [meyersound.com/videos](http://meyersound.com/videos).

### COMPASS RMS SOFTWARE

Compass RMS™ software provides extensive system status and performance data for each loudspeaker, including amplifier voltage, limiting activity, power output, fan and driver status, as well as mute and solo capability. Loudspeakers are added to the RMS network and assigned a node name during a one-time discovery procedure. Once loudspeakers are identified on the RMS network, they appear in Compass RMS as icons that can be customized to suit your needs (Figure 45).



Figure 45: Compass RMS Window

Individual loudspeakers can be physically identified with the Wink option in RMS, which lights the Wink LED on the RMS module of that particular loudspeaker. Loudspeaker icons can be arranged in Compass RMS and saved as pages to represent how the loudspeakers have been deployed in the system. Multiple pages can be saved and recalled for specific performances and venues.

## RMS MODULE (ANALOG MODEL)

The ULTRA-X20/22/23 analog version RMS user panel (Figure 46) includes a Wink/Activity LED. (For a view of the entire user panel, see Figure 8 on page 13.)

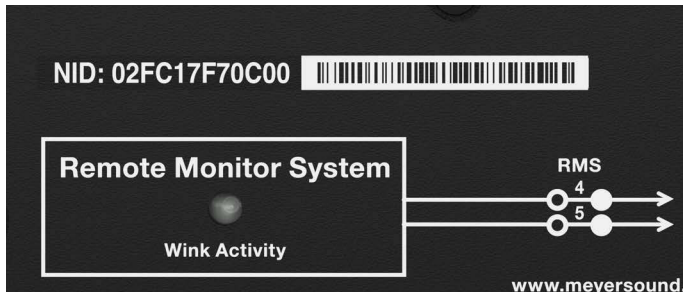


Figure 46: ULTRA-X20/22/23 RMS Module

**NOTE:** The Wink/Activity LED on the RMS user panel is used exclusively by RMS and has no effect on the acoustical or electrical activity of the loudspeaker.

**TIP:** The loudspeaker can also be winked by clicking the Wink button on the loudspeaker icon in Compass RMS.

## Wink/Activity LED (Green)

The green Wink/Activity LED indicates the status of the loudspeaker:

- During startup, the LED flashes green 10 times.
- If the loudspeaker has not yet been discovered on the RMS network, the LED is not lit after startup.
- If the loudspeaker has been successfully discovered on the RMS network, the LED flashes green continuously and flashes more rapidly with increased data activity.
- When the loudspeaker is winked, by clicking the Wink button in Compass RMS, the LED is solid green. The LED remains solid green until the loudspeaker is unwinked.

**TIP:** The Wink function is useful for identifying the physical loudspeaker corresponding to a loudspeaker icon in Compass RMS.

## RMS Module Neuron ID (Analog Model)

Each RMS module has a unique 12-character Neuron ID (NID) that identifies the loudspeaker on the network. The NID is automatically detected by RMServer but can also be entered manually, if necessary, when configuring RMS systems in Compass RMS without loudspeakers present. The NID label is located on the RMS user panel above the Wink Activity LED.

## ULTRA-X20/22/23 DIGITAL WINK FUNCTION

Once the ULTRA-X20/22/23 Digital has been configured into a network in Compass Control Software, the icons within the loudspeaker's detail page include a W (Wink) icon. Pressing this icon will turn it green and cause the Wink push button of the associated loudspeaker to illuminate at the center.



Figure 47: ULTRA-X20/22/23 Digital Audio Wink Push Button and LED

Conversely, if the Wink button on the ULTRA-X20/22/23 Digital loudspeaker is pressed, a winking happy face is displayed on the associated loudspeaker page in Compass (Figure 48).

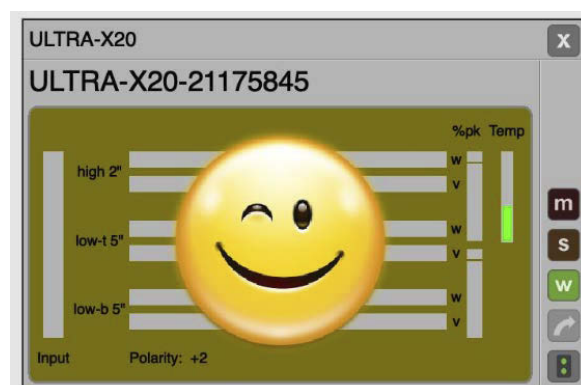


Figure 48: Result of Pressing Wink Button on Rear of Loudspeaker

These features facilitate matching of the physical loudspeaker to the Compass control software loudspeaker listings.

## SYSTEM DESIGN AND INTEGRATION TOOLS

This chapter introduces MAPP, Meyer Sound's patented system design tool and the Galileo GALAXY Network Platform.

### MAPP SYSTEM DESIGN TOOL

The MAPP System Design Tool (Figure 49) is a powerful, cross-platform application for accurately predicting the coverage pattern, frequency response, phase response, impulse response, and SPL capability of individual or arrayed Meyer Sound loudspeakers.

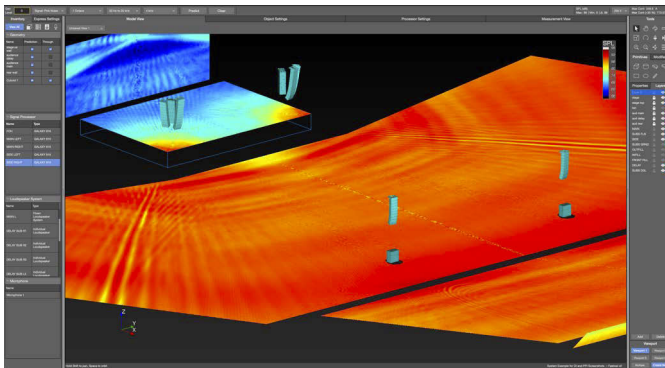


Figure 49: MAPP System Design Tool

Whether planning for fixed installations or for tours with multiple venues, use MAPP to accurately predict the appropriate loudspeaker deployment for each job, complete with coverage data, system delay and equalization settings, rigging information, and detailed design illustrations. MAPP's accurate, high-resolution predictions ensure that systems will perform as intended, thereby eliminating unexpected coverage problems and minimizing onsite adjustments.

The key to the accuracy of MAPP's predictions is Meyer Sound's exhaustive database of loudspeaker measurements. Performance predictions for each loudspeaker are based on 3-dimensional, 65,000+ 1/48th-octave-band measurements taken in the Meyer Sound anechoic chamber. The extraordinary consistency between Meyer Sound loudspeakers guarantees that predictions from MAPP will closely match their actual performance.

MAPP software allows for configuration of Meyer Sound loudspeaker systems and definition of the environment in which they operate, including air temperature, pressure, humidity, and the location of prediction surfaces. Importing both CAD (.DXF) and Sketchup (.SKP) files containing detailed venue information to act as an anchor model to the prediction surfaces and a visual aid to facilitate prediction data interpretation is also possible.



**TIP:** See [meyersound.com](http://meyersound.com) for support and more information about MAPP.

### MAPP Capabilities

With MAPP, the user can:

- Simulate different loudspeaker configurations to refine system designs and determine the best coverage for intended audience areas
- Model loudspeaker interactions to locate constructive and destructive interferences so that loudspeakers can be re-aimed and repositioned as necessary
- Place microphones anywhere in the Model View space and predict loudspeaker frequency response, phase response, and sound pressure levels at each microphone position
- Determine delay settings for fill loudspeakers using the Inverse Fast Fourier Transform and phase response feature
- Preview the results of signal processing to determine optimum settings for the best system response
- Automatically calculate load information for arrays to determine necessary minimum rigging capacity, front-to-back weight distribution, and center of gravity location
- Generate and export system images and system PDF reports for client presentations
- Synchronize GALAXY processor output channel settings in real time with virtual or real GALAXY units, allowing in-the-field changes to be predicted during system alignments.

## **GALILEO GALAXY NETWORK PLATFORM**

The Galileo GALAXY Network Platform is a sophisticated loudspeaker management tool for controlling all Meyer Sound speaker types. The GALAXY loudspeaker processor extends a high level of audio control in driving and aligning loudspeaker systems with multiple zones. It provides a powerful tool set for corrective equalization (EQ) and creative fine-tuning for a full range of applications from touring to cinema.

Users can readily program the GALAXY processor using Compass software running on a host computer or via the Compass Go application for the iPad. Connecting MAPP to the GALAXY processor will also allow the user to push output channel settings created in MAPP as a starting point. Compass Control Software includes custom-designed settings for each family of speakers, as well as to integrate families together. For example, the Product Integration feature matches the phase characteristics between Meyer speaker families to ensure the most coherent summation.

Processing tools for inputs and outputs include delay, parametric EQ and U-Shaping EQ. Output processing also includes polarity reversal, Low-Mid Beam Control (LMBC), atmospheric correction, and All Pass filters.

The built-in summing and delay matrices allow a user to easily assign gain and delay values, respectively, at each cross point. This capability greatly facilitates using one loudspeaker to satisfy multiple purposes.

Front panel controls let a user intuitively and quickly operate a GALAXY processor without a computer during live use.

The GALAXY 408 and GALAXY 816 processor versions have the same audio processing capability with different I/O. Visit [meyersound.com](http://meyersound.com) to locate their datasheets or operating instructions for more information.

## MEYER SOUND WEATHER PROTECTION

The Weather Protection option from Meyer Sound is intended to increase the useful life of Meyer Sound loudspeakers when they are installed outdoors and exposed to different and often harsh weather conditions.

Meyer Sound Weather Protection includes a penetrating treatment to raw wood, use of special primers, and plating on all steel parts used (or alternatively, the use of stainless steel hardware). Weather Protection is designed to prevent malfunctions caused by harsh operating environments and slows the accelerated wear and tear that occurs in outdoor environments.

### When Is Weather Protection Advisable?

Weather Protection is strongly recommended for all permanent outdoor installations where loudspeakers are directly exposed to the elements. This recommendation includes desert and semi-arid climates, where protection against dust and sand is important, and where infrequent rainstorms can contribute to deterioration of loudspeaker components.

Weather Protection is also recommended when the loudspeakers are sheltered from direct exposure to precipitation, but are nevertheless exposed to prolonged high humidity, fog or mist. Examples would be installations on covered outdoor terraces or pavilions.

Weather Protection is further advisable for portable or touring systems when any significant outdoor use is anticipated. Even though standard procedures may call for using external protective measures, these are often not implemented in time to prevent moisture intrusions that could lead to premature performance degradation of the loudspeaker.

### Climate Variation and Owner Maintenance

The wear and tear on a loudspeaker will vary significantly with different climatic conditions. For example, a weather-protected loudspeaker installed in a sunlight-exposed location on an ocean pier will experience much harsher conditions than a loudspeaker in a similar installation that is shaded by trees and exposed only to rainfall. The constant exposure to direct UV radiation and a salt air environment will cause a loudspeaker to wear more quickly than one with partial UV shielding and exposed only to freshwater moisture.

Wear can eventually affect the performance of the loudspeaker. It also affects aesthetics. For example, in salt air environments, the exterior grille can quickly show signs of oxidation, causing unsightly discoloration.

Apart from selecting suitable weather protection, the progress of wear and tear on the loudspeaker can be slowed by a regular schedule of inspection and cleaning. This maintenance is particularly necessary in harsh environments. Inspection and cleaning should include routine removal of any visible oxidation or environmental particulates, as these can accelerate metal corrosion or decay of the cabinet. If installed loudspeakers are not in use for an extended period, exterior protection or temporary removal and storage of the loudspeakers should be considered.

### Benefits of Weather Protection

There are several benefits to selecting the Meyer Sound Weather Protection option:

**Functionality**—Weather Protection prolongs the service life of the loudspeaker by preventing premature degradation of internal components.

**Safety**—Weather Protection lessens the chance of electrical malfunctions or structural failures.



**WARNING:** IT IS THE RESPONSIBILITY OF PURCHASERS/USERS/OPERATORS TO SELECT WEATHER PROTECTION WHEN APPROPRIATE FOR THEIR USE AND TO PERIODICALLY INSPECT THEIR LOUDSPEAKER INSTALLATIONS FOR ANY DETERIORATION THAT MAY LEAD TO SAFETY CONCERNS.

**Aesthetics**—Weather Protection slows wear and tear on the exterior of the loudspeaker in harsh conditions. Early signs of wear and tear on the exterior of the loudspeaker indicate over-exposure to the elements.

**Standards Compliance**—Weather Protection helps in meeting IP ratings for loudspeakers. IP ratings are an internationally recognized standard often used in installations involving our products. A further explanation of IP ratings is given in the “IP Ratings” Section on page 39.

## WEATHER PROTECTION COMPONENTS

### Standard Weather Protection

Meyer Sound designs toward an IP rating of IPX4 (see “IP Ratings” on page 39) for Standard Weather Protection, which includes the following components:

- Wood treatment—Prior to cabinet manufacturing, the raw wood receives a special treatment that penetrates and stabilizes the wood fibers to withstand a wide range of temperatures and exposure to extreme humidity.
- Cabinet finishing—The assembled cabinets receive a highly impervious finish that includes a sealing primer and a finishing topcoat. The coatings are applied on both surfaces, with one coat on the interior and two on the exterior. The final step is a two-part modified acrylic urethane similar to that used in military applications.
- Driver treatment—All cone drivers are coated with a water-resistant sealant.
- Exterior protection—Grille frames are coated to resist corrosion, and all components that mount to the cabinet use custom gaskets and stainless steel fasteners.
- Weather-protected connectors—Use of individual weather-protected connectors or removable rain hoods designed to shield conventional connectors even in wind-driven rain.

## INSTALLATION PRACTICES

Meyer Sound assumes normal and accepted installation practices are used when installing Meyer Sound Loudspeakers outdoors. Deviation from such practices may cause weather protection to be ineffective and void the warranty for the loudspeaker.

Examples of unacceptable and acceptable installation practices include:

- Loudspeakers installed outdoors should not face upward.
- Loudspeakers with a rain hood should be installed in such a way that the rain hood opening is not facing any direction but down.
- Meyer Sound-supplied rigging components should not be modified (for example, by drilling additional holes in a MUB for mounting to a wall). When an installer/integrator modifies a Meyer Sound supplied rigging component to support their installation method, it is considered compromised and out of warranty.

- All loudspeaker cabling must be installed with a “drip-loop” or equivalent method to ensure that rain or water is NOT wicked toward the loudspeaker.



**NOTE:** For individual weather-protected connectors, installers must use Neutrik TOP XLR cables in order to meet the IP65 rating of the connectors.

If in doubt about an installation method, contact Meyer Sound Technical Support for assistance.

Always discuss the environmental conditions of your Meyer Sound installation with your Sales Manager, and verify the availability of Weather Protection for your selected loudspeaker models. The Sales Manager, together with Technical Support, will verify the appropriate level of weather protection for the loudspeakers and related rigging hardware.

## IP RATINGS

IP stands for “Ingress Protection.” The current format for expressing an IP rating is a 2-digit code. The first digit of an IP rating represents protection from solid objects. The second digit of an IP rating represents protection from water or moisture. Table 8 provides a chart of IP ratings and the corresponding definitions of the rating.



**NOTE:** IP ratings only apply to the “ENCLOSURE.” A loudspeaker is considered an enclosure and as such we can apply an IP rating to it. Rigging hardware is not an enclosure and therefore IP ratings do not apply. Also, cable and cable-mount connectors used to connect to the loudspeaker are NOT part of the enclosure and therefore not part of the IP rating. Only the chassis-mounted part of the connector is considered part of the enclosure.

**Table 8: IP Ratings Definition Chart**


First Digit (Protection against solid objects)	Definition	Second Digit (Protection against liquids)	Definition
X	Characteristic numeral is not required to be specified.	X	Characteristic numeral is not required to be specified.
0	No protection.	0	No protection.
1	Protected against solid objects over 50 mm.	1	Protected against vertically falling drops of water.
2	Protected against solid objects over 12 mm.	2	Protected against direct sprays up to 15° from the vertical.
3	Protected against solid objects over 2.5 mm.	3	Protected against direct sprays up to 60° from the vertical.
4	Protected against solid objects over 1 mm.	4	Protected against direct sprays from all directions. Limited ingress permitted.
5	Protected against dust. Limited ingress permitted.	5	Protected against low-pressure jets of water from all directions. Limited ingress permitted.
6	Totally protected against dust.	6	Protected against strong jets of water from all directions. Limited ingress permitted.
		7	Protected against the effect of temporary immersion between 15 cm and 1 m.
		8	Protected against the effect of long-term submersion of 1 m or more.






## WEATHER-PROTECTED ULTRA-X20/22/23 INSTALLATION

A weather-protected version of the ULTRA-X20/22/23 is available with sealed Neutrik connectors that provide protection from the elements in fixed outdoor installations. The weather-protected ULTRA-X20/22/23 can be mounted vertically or horizontally as described below. For instructions on how to properly connect the power cable, see “PowerCON TRUE1 TOP Connection” on page 42.

 **CAUTION:** Ensure that connectors are covered with their appropriate sealing plugs when not in use to prevent dust intrusion.

### PERMISSIBLE ORIENTATIONS

 **CAUTION:** When mounting the loudspeaker, ensure that the cables will exit from the bottom of the loudspeaker (vertical orientation) or right side of the loudspeaker (horizontal orientation). There is only one permissible vertical orientation (Figure 50) and one permissible horizontal (Figure 51).

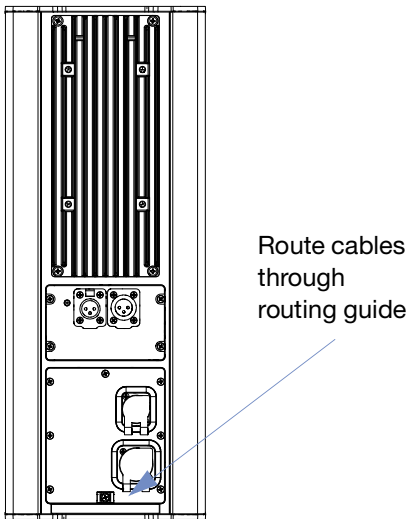


Figure 50: Only Permissible Vertical Orientation

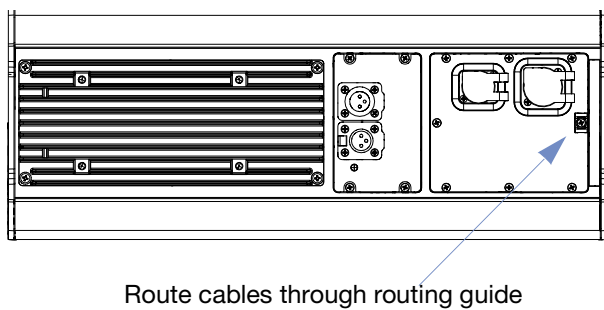



Figure 51: Only Permissible Horizontal Orientation

### Downtilt and Uptilt

 **CAUTION:** The weather-protected ULTRA-X20/22/23 loudspeaker must be mounted with a 0° tilt, or preferably with a slight downtilt with the cables exiting from the bottom. This angle shields the driver from the elements and does not allow water to accumulate in the cabinet. Do not tilt the cabinet up, as the drivers and cabinet might accumulate water. (Figure 52 and Figure 53).

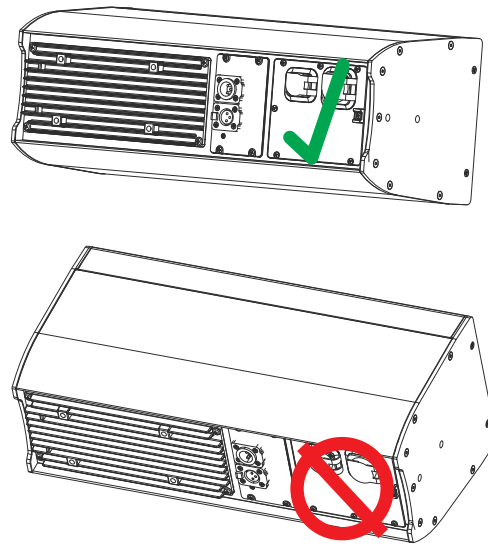


Figure 52: Downtilt Permissible (top); Uptilt **NOT** Permissible (bottom)

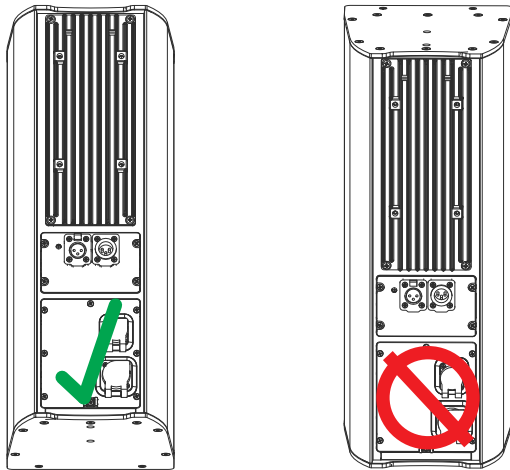


Figure 53: Downtilt Permissible (left); Uptilt **NOT** Permissible (right)

### Horizontal Tilt

**CAUTION:** If tilting the loudspeaker from 0° horizontal, ensure that the horizontal tilt leaves the port below the electronics, so that water does not enter from the port and accumulate in the cabinet (Figure 54).

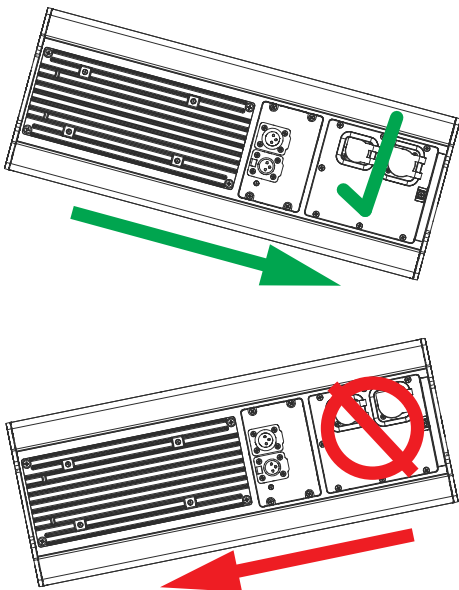


Figure 54: Horizontal Tilt-Away from Electronics Permissible (top); Horizontal Tilt-Toward Electronics **NOT** Permissible (bottom)

### POWERCON TRUE1 TOP CONNECTION

To connect a PowerCON cable to the chassis, match the one wider notch on the cable connector to the corresponding one larger guide slot on the chassis.

**CAUTION:** When inserting a PowerCON connector into the chassis, use a maximum force of 1 Newton (0.225 lb).

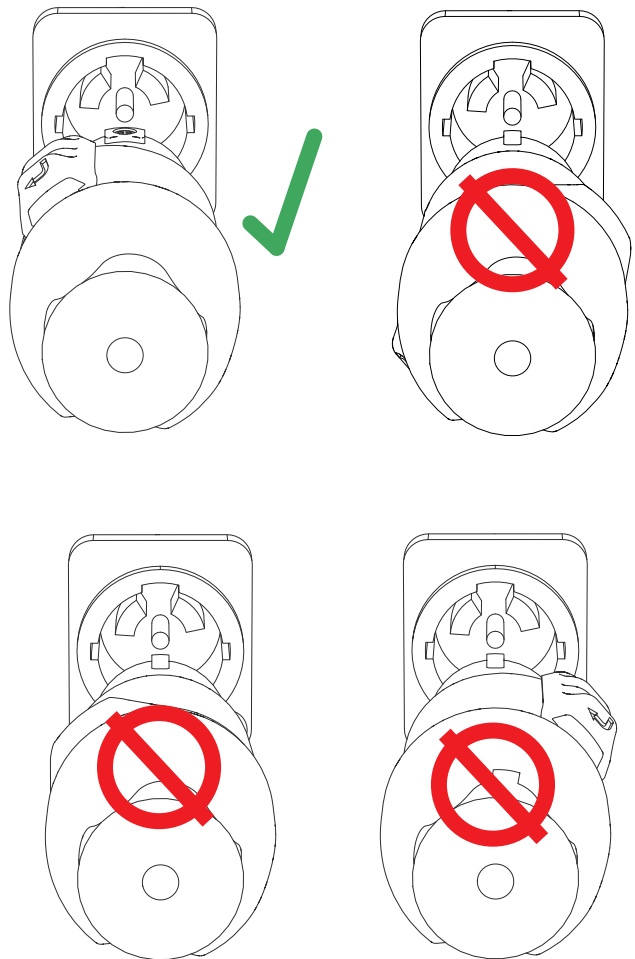



Figure 55: Proper PowerCON Connector Orientation

**CAUTION:** Incorrect insertion may cause electrical contact misalignment resulting in equipment malfunction and/or personal injury.

After inserting properly as indicated in Figure 55 (top left), and Figure 56 on page 43, twist the cable connector clockwise to lock (Figure 57 on page 43).

 **NOTE:** The proper twist-lock is achieved when the silver-colored tab is in the position shown in Figure 57 and an audible click is heard.

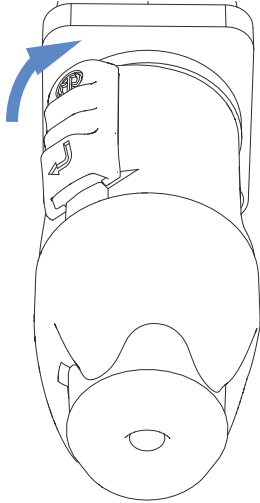


Figure 56: Rotate the Connector to Lock

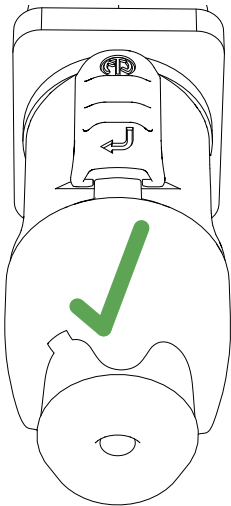


Figure 57: Locked Connector Position



## ROTATING THE HORN

The ULTRA-X20 and ULTRA-X22 horns may be rotated for increased installation flexibility. However, care must be taken so as to not damage the loudspeaker.

To rotate the horn, use the following steps:

1. Remove the grille by removing the four 8-32 x 0.5-inch flat-head Phillips screws (two on the top and two on bottom) of the loudspeaker grille.

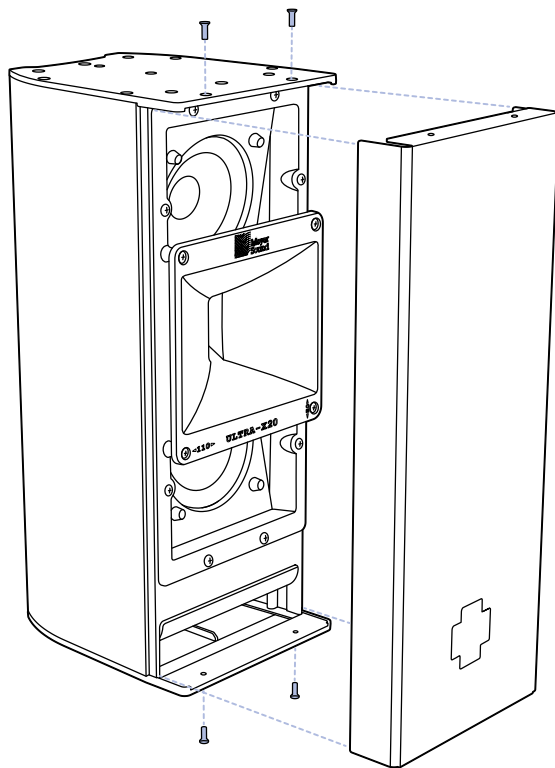


Figure 58: Remove ULTRA-X20/22/23 Grille Frame.

2. Remove the four truss-head Phillips 8-32 x 0.5-inch screws holding the horn in place.

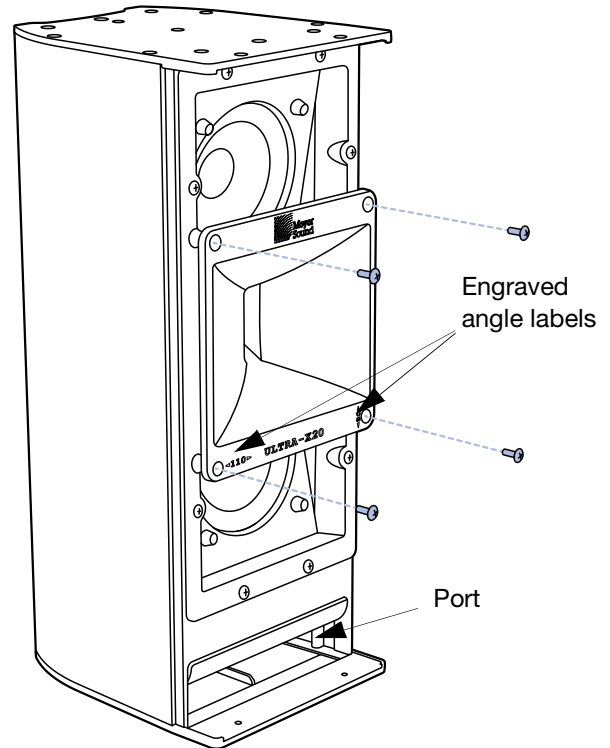


Figure 59: Removing Four Screws Holding Horn in Place

3. Determine the present orientation of the horn by checking the horn throat orientation when the speaker is vertical with the port at the bottom. The cabinet is vertical and the horn is in the 110° horizontal by 50° vertical orientation when the Meyer Sound Logo on the horn and on the bezel are at the top, the horn throat is in the vertical orientation, and the 110° emboss is also horizontal (Figure 60).

The cabinet is vertical and the horn is in the 50° horizontal by 110° vertical orientation when the Meyer Sound Logo on the horn is on the right, the horn throat is in the horizontal orientation, and the 50° emboss is also horizontal (Figure 61).

4. To rotate the horn from 110° x 50° to 50° x 110°, pull the horn out, rotate it **90°**, so that the horn throat is oriented horizontally, the Meyer Sound Logo on the horn is on the right, and the 50° emboss is also horizontal (Figure 61).

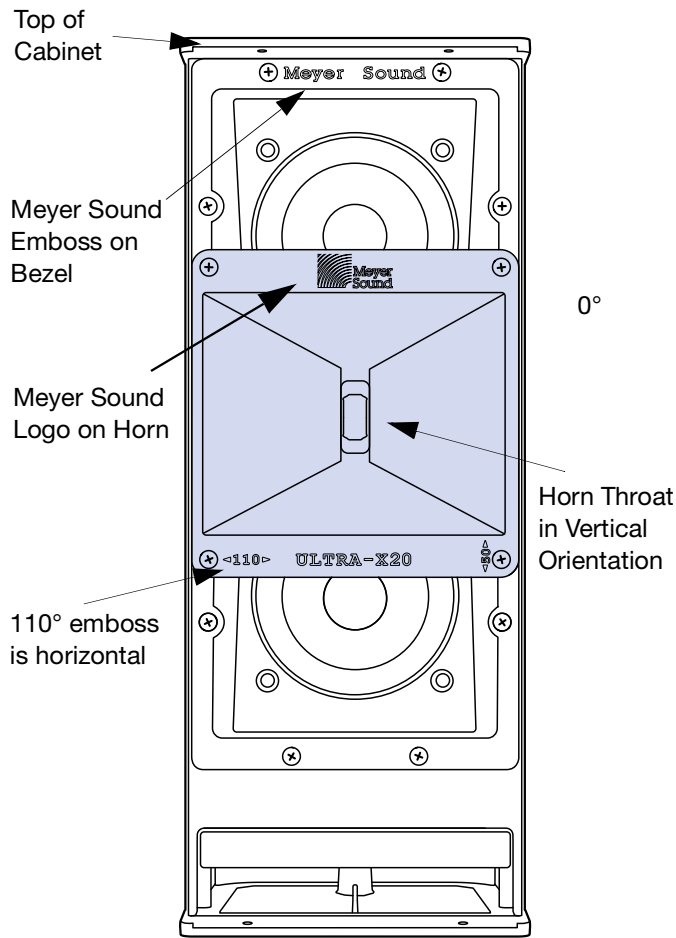


Figure 60: 110° horizontal by 50° vertical horn orientation

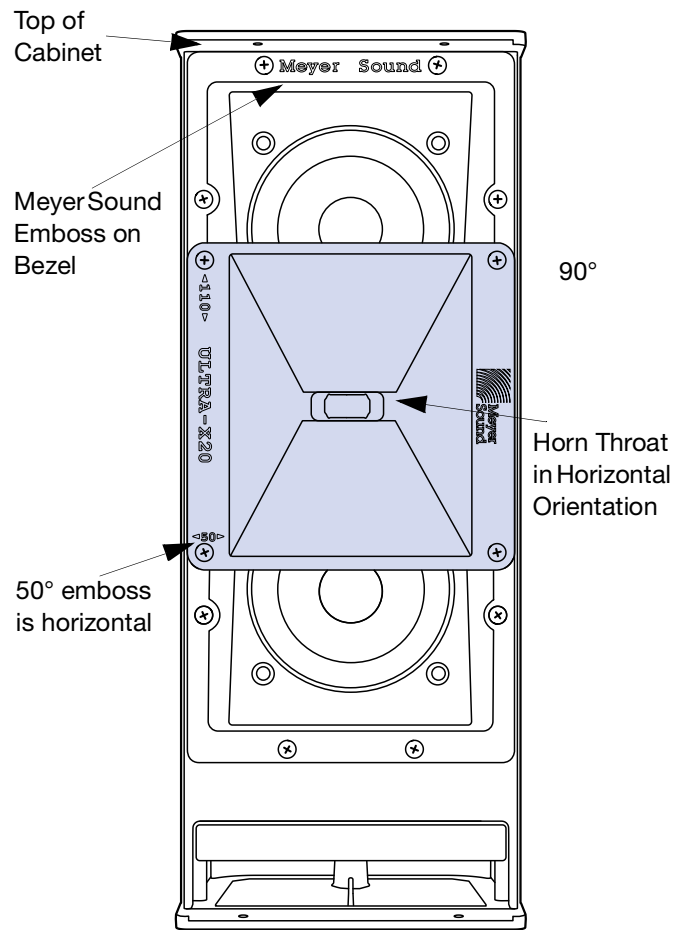



Figure 61: 50° horizontal by 110° vertical horn orientation

5. To rotate the horn from 50° x 110° to 110° x 50°, pull the horn out, rotate it **-90°**, so that the horn throat is oriented vertically, the Meyer Sound Logo on the horn is on the top, and the 110° emboss is also horizontal (Figure 60).
6. Replace the four screws removed in Step 2 to re-secure the horn into position. Be sure to use the 8-32 x 0.5-inch screws. The recommended torque value for the horn screws is 12 in-lb (1.36 N·m).
7. Replace the grille and secure it with the four 8-32 x 1.00-inch screws removed in step 1. Meyer Sound recommends applying blue thread locker (medium strength) to screws in the leading three threads before replacing. The recommended torque value for the grille screws is 8 in-lb (0.90 N·m).

 **NOTE:** In the paragraphs above, instructions and graphics for the ULTRA-X20 are used. The same procedure holds for the ULTRA-X22 (with 110° replaced by 80°). The ULTRA-X23 is symmetrical; rotation is possible but not necessary.


## ULTRA-X20/22/23 SPECIFICATIONS

### ULTRA-X20/22/23 ACOUSTICAL, ELECTRICAL, AND PHYSICAL SPECIFICATIONS

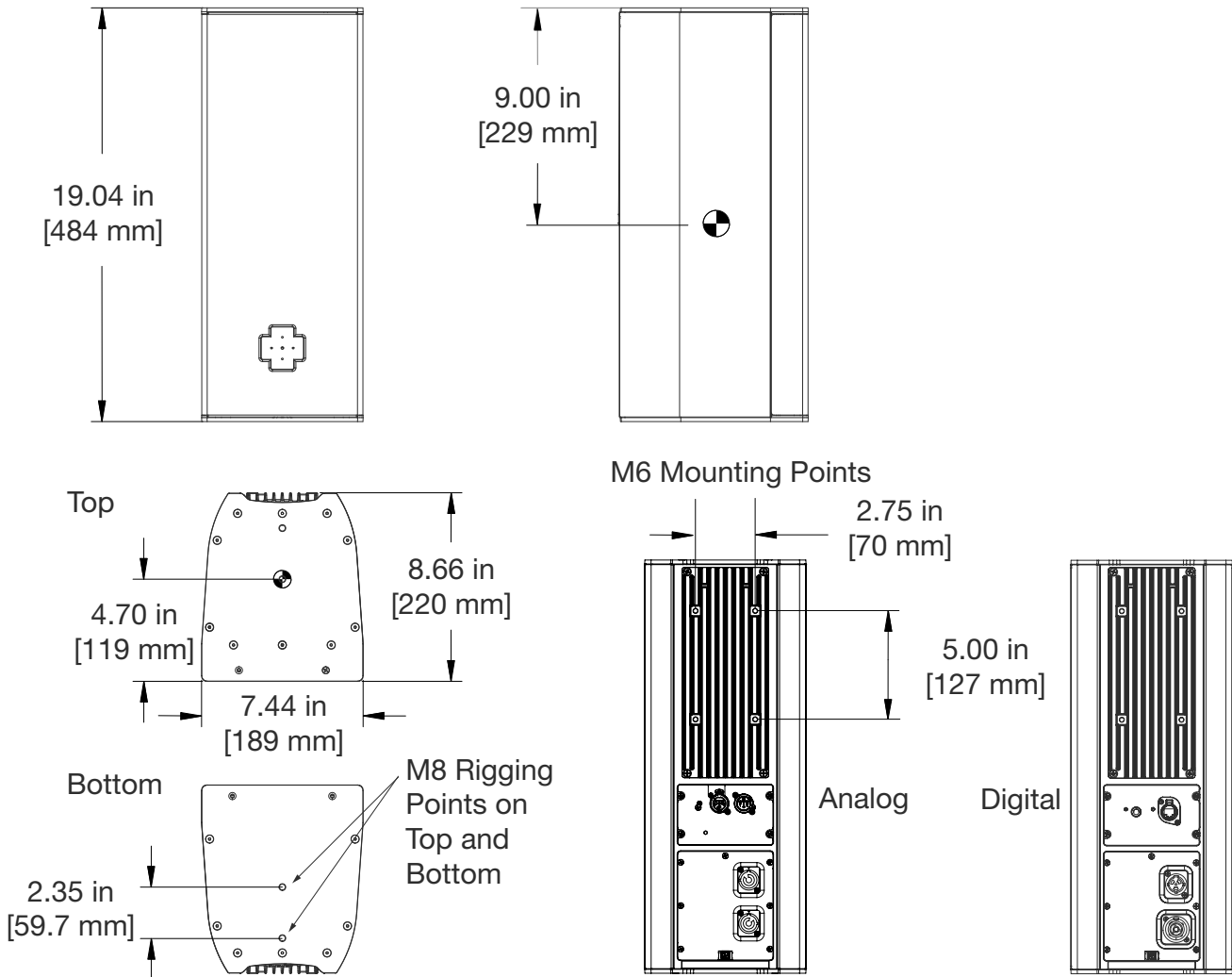
ACOUSTICAL			
	ULTRA-X20	ULTRA-X22	ULTRA-X23
Operating Frequency Range	60 Hz – 18 kHz	60 Hz – 18 kHz	60 Hz – 18 kHz
	<b>Note:</b> Recommended maximum operating frequency range. Response depends on loading conditions and room acoustics.		
Frequency Response	65 Hz – 17.5 kHz $\pm 4$ dB	65 Hz – 17.5 kHz $\pm 4$ dB	65 Hz – 17.5 kHz $\pm 4$ dB
	<b>Note:</b> Measured free field with 1/3 octave frequency resolution at 4 meters.		
Phase Response	95 Hz to 18 kHz $\pm 45^\circ$	95 Hz to 18 kHz $\pm 45^\circ$	95 Hz to 18 kHz $\pm 45^\circ$
Linear Peak SPL	<b>127 dB with 20 dB crest factor (M-noise)</b> , 123.5 dB (Pink Noise), 125.5 dB (B-noise)	<b>128.5 dB with 20 dB crest factor (M-noise)</b> 123.5 dB (Pink Noise), 125 dB (B-noise)	<b>127.5 dB with 20 dB crest factor (M-noise)</b> 124 dB (Pink Noise), 125.5 dB (B-noise)
	<b>Note:</b> Linear Peak SPL is measured in free-field at 4 m referred to 1 m. Loudspeaker SPL compression measured with M-noise at the onset of limiting, 2-hour duration, and 50-degree C ambient temperature is < 2 dB. <b>M-noise</b> is a full bandwidth (10 Hz–22.5 kHz) test signal developed by Meyer Sound to better measure the loudspeaker’s music performance. It has a constant instantaneous peak level in octave bands, a crest factor that increases with frequency, and a full bandwidth Peak to RMS ratio of 18 dB. <b>Pink noise</b> is a full bandwidth test signal with Peak to RMS ratio of 12.5 dB. <b>B-noise</b> is a Meyer Sound test signal used to ensure measurements reflect system behavior when reproducing the most common input spectrum, and to verify there is still headroom over pink noise.		
Coverage	<b>Rotatable horn:</b> 110° x 50° (at –6 dB)	<b>Rotatable horn:</b> 80° x 50° (at –6 dB)	110° x 110° (at –6 dB)
TRANSDUCERS			
Low Frequency	Two 5-inch cone drivers; 6 $\Omega$ nominal impedance		
High Frequency	One 2-inch diaphragm compression driver connected to a horn; 8 $\Omega$ nominal impedance		
AUDIO INPUT	ANALOG VERSION		DIGITAL VERSION
Type	Differential, electronically balanced		–
Maximum Common Mode Range	$\pm 15$ V DC, clamped to earth for voltage transient protection		–
Connectors	XLR 3-pin female input with male loop output; optional XLR 5-pin connector to accommodate both balanced audio and RMS signals; 3-pin XLR TOP connectors on weather-protected version only.		etherCON TOP (Total Outdoor Protection) <b>Note:</b> This etherCON TOP chassis connector is certified for outdoor protection only when used in combination with an etherCON TOP cable connector or with the chassis sealing cap in place when the chassis connector is not in use.
			–
Input Impedance	10 k $\Omega$ differential between pins Audio(+) and Audio(–)		–

Wiring	Pin 1: Chassis/earth through 1 k $\Omega$ , 1000 pF, 15 V clamp network to provide virtual ground lift at audio frequencies Pin 2: Audio(+) Pin 3: Audio(-) Pin 4: RMS (polarity insensitive) Pin 5: RMS (polarity insensitive) Case: Earth ground and chassis <b>Note:</b> Pins 4 and 5 (RMS) only included with XLR 5-pin connector that accommodates both balanced audio and RMS signals.	—
Nominal Input Sensitivity	0 dBV (1 V rms) continuous average is typically the onset of limiting for noise and music	—
Input Level	Audio source must be capable of producing +20 dBV (10 V rms) into 600 $\Omega$ to produce maximum peak SPL over the operating bandwidth of the loudspeaker	—
Digital Format		Milan Certified
<b>AMPLIFIER</b>		
Type	Three-channel Class D	
Total Output Power	860 W peak <b>Note:</b> Peak power based on the maximum unclipped peak voltage the amplifier will produce into the nominal load impedance.	
THD, IM TIM	< 0.02%	
Cooling	Convection	
<b>AC POWER</b>		
Connectors	powerCON 20 input with loop output; powerCON TRUE1 TOP (Total Outdoor Protection) with loop output on weather-protected version	powerCON TRUE1 TOP (Total Outdoor Protection) with loop output <b>Note:</b> This powerCON TRUE1 chassis connector is certified for outdoor protection only when used in combination with a powerCON TRUE1 cable connector or with the chassis sealing caps in place when the chassis connector is not in use.
Automatic Voltage Selection	90–265 V AC, 50–60 Hz	
Safety Agency Rated Operating Voltage	100–240 V AC, 50–60 Hz	
Turn On/Turn Off Points	90 V AC turn-on, no turn-off; internal fuse protection above 265 V AC	
<b>Current Draw</b>		
Idle Current	0.15 A rms (115 V AC); 0.13 A rms (230 V AC); 0.16 A rms (100 V AC)	
Maximum Long-Term Continuous Current (> 10 sec)	0.9 A rms (115 V AC); 0.5 A rms (230 V AC); 1.1 A rms (100 V AC)	
Burst Current (< 1 sec)	1.6 A rms (115 V AC); 0.8 A rms (230 V AC); 1.8 A rms (100 V AC) <b>Note:</b> AC power cabling must be of sufficient gauge so that under burst current rms conditions, cable transmission losses do not cause the loudspeaker's voltage to drop below the specified operating range.	
Maximum Instantaneous Peak Current	3.5 A peak (115 V AC); 1.8 A peak (230 V AC); 4.1 A peak (100 V AC)	
Inrush Current	< 20 A peak	



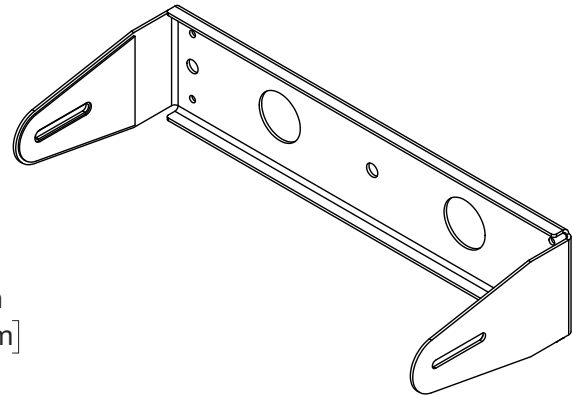
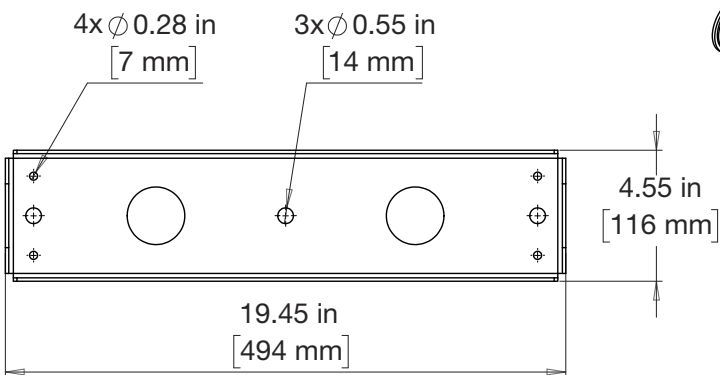
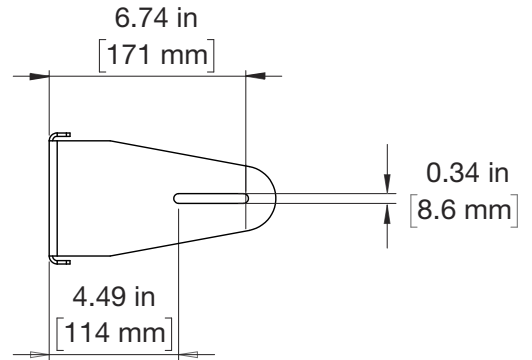
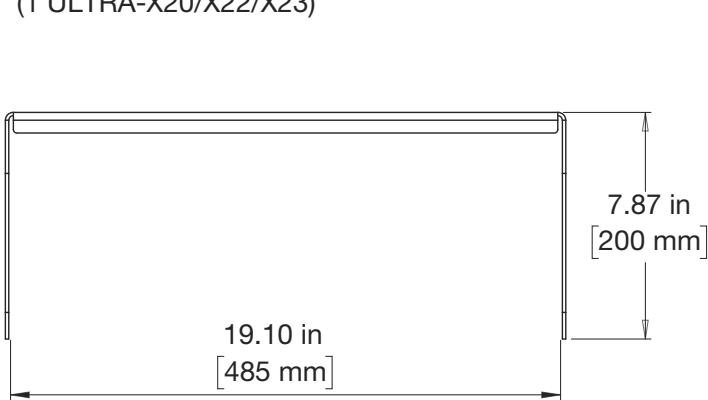
REMOTE MONITORING	ANALOG VERSION	DIGITAL VERSION
	Optional RMS module: two-conductor twisted-pair network that reports all operating parameters of amplifiers to system operator's host computer via the RMServer hardware unit. <b>Note:</b> RMServer hardware unit required and sold separately.	Integrated monitoring, accessible via Compass Control Software
<b>PHYSICAL</b>		
Dimensions	W: 7.44 in (189 mm) x H: 19.04 in (484 mm) x D: 8.66 in (220 mm)	
Weight	27 lb (12.3 kg)	
Enclosure	Aluminum with slightly textured black finish	
Protective Grille	Powder-coated, round perforated steel	
Rigging	Two integrated M8 threaded points on each end; optional accessories for various rigging options (see "QuickFly Rigging" on page 21); four M6 threaded holes with 5-inch by 2.75-inch (127 mm by 70 mm) hole pattern on the rear for use with third-party wall mounts.	
<b>ENVIRONMENTAL</b>		
Operating Temperature	0 °C to +45 °C	 <p>3K59 OR 3JK6 COMMERCIAL AUDIO SYSTEM</p> <p>UL US LISTED</p> <p>CE</p>
Non Operating Temperature	-40 °C to +75 °C	
Humidity	To 95% at 45 °C (non-condensing)	
Operating Altitude	To 5,000 m (16,404 ft)	
Non Operating Altitude	To 12,000 m (39,370 ft)	
Shock	30 g 11 msec half-sine on each of 6 sides	
Vibration	10 Hz – 55 Hz (0.010 m peak-to-peak excursion)	
IP Rating	Weather-protected version rated IP54. See "Meyer Sound Weather Protection" on page 37 and "Weather-Protected ULTRA-X20/22/23 Installation" on page 41 for details.	

## ULTRA-X20/22/23 LOUDSPEAKER DIMENSIONS



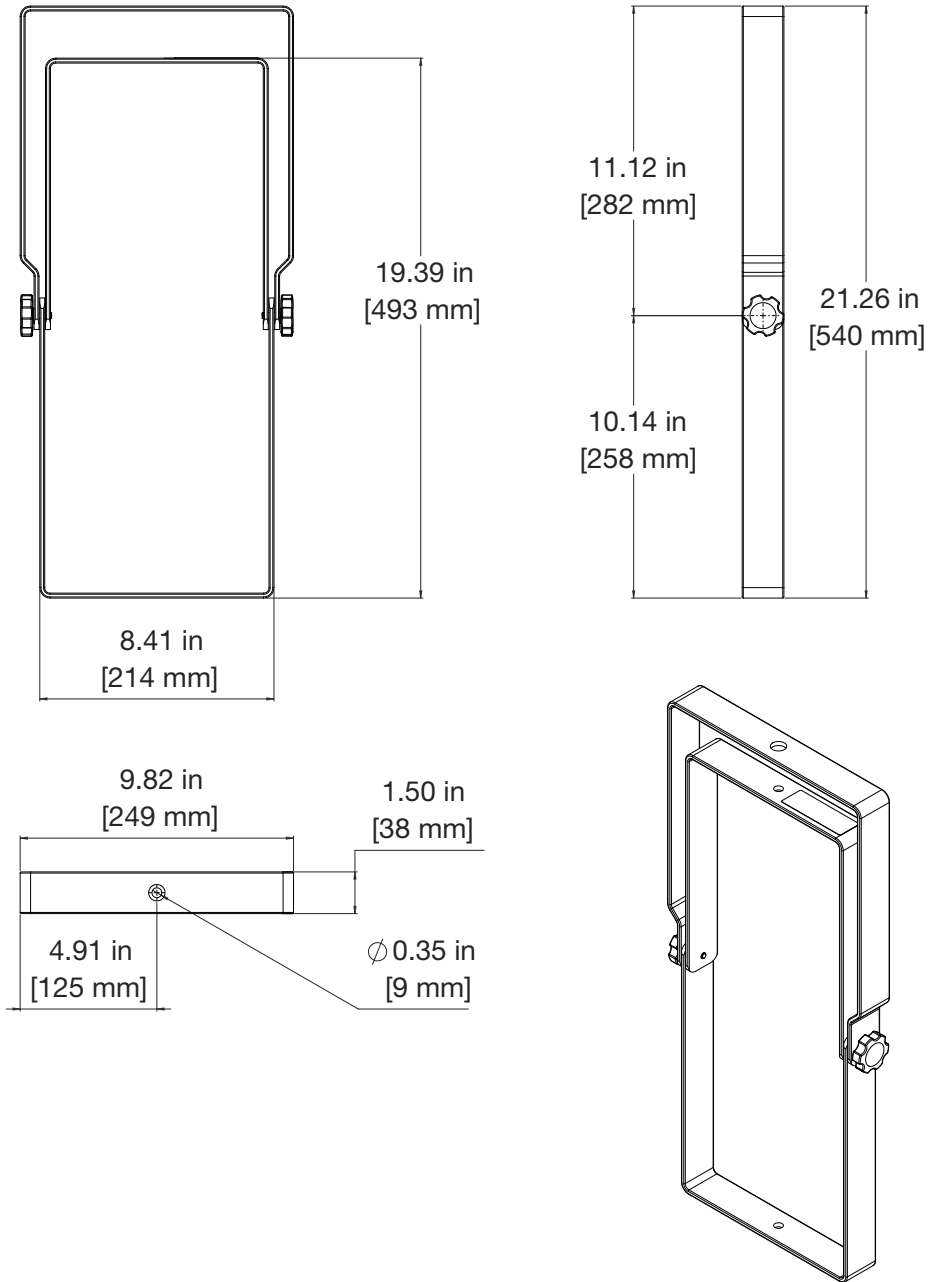
## MUB-X20 DIMENSIONS

Self-weight: 5 lb [2.3 kg]  
 Load rating 5:1: 25 lb [11.4 kg]  
 (1 ULTRA-X20/X22/X23)



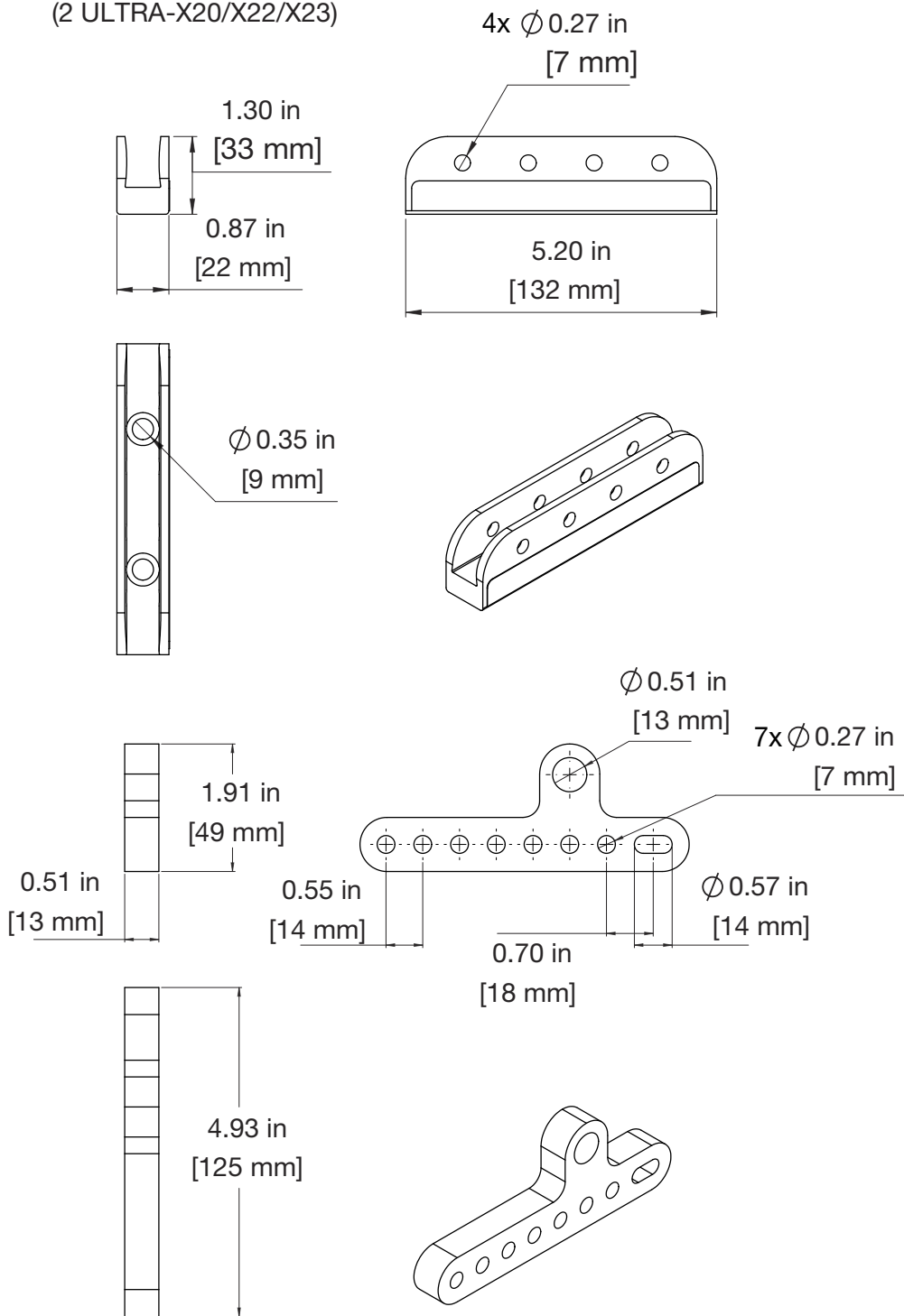
## MYA-X20 DIMENSIONS

Self-weight: 8 lb [3.6 kg]  
Load rating 5:1: 25 lb [11.4 kg]  
(1 ULTRA-X20/X22/X23)



### MTC-X20 DIMENSIONS

Self-weight: 0.3 lb [0.1 kg]  
 Load rating 5:1: 50 lb [22.7 kg]  
 (2 ULTRA-X20/X22/X23)









THINKING SOUND

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