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# Installation and Maintenance Manual HyperSpike<sup>®</sup> MPA-400



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# IIIIII HYPERSPIKE

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The HyperSpike MPA400 contains parts and assemblies susceptible to damage by electrostatic discharge (ESD). Use proper grounding techniques when working in the module.

# 1. OVERVIEW

## 1.1 Compatibility

The HyperSpike MPA400 system interfaces with the following HyperSpike direct drive speakers.

90243A-802-XX – LineWave 4 speaker (8 Ohm) 90243A-803-XX – LineWave 8 speaker (4 Ohm) 90219A-801-XX – TCPA-10 (8 Ohm)

The Hyperspike MPA400 is compatible with all POE Types (1-4). The models listed below were used to define product performance and specifications. Acoustic performance may vary based on the make and model of the selected switch.

PoE – Netgear GS108PE PoE+ – Netgear GS108PP 4PPoE (Type 4) – Cudy POE400 PoE Injector

## 1.2 Description

The MPA400 system is an audio over IP decoder which includes an amplifier for digital streaming to HyperSpike<sup>®</sup> Line Wave and TCPA-10 (direct drive) audio speakers. Depending on the specific application, it is capable of outputting up to 20W when powered with PoE+ and 40W when powered by 4PPoE or the optional 24V power supply.

Part Number	Description
72813B-801	24VDC PowerSupply

#### Table 1: Optional Accessories Installed On-Site





## 1.3 Identification

To aid future troubleshooting and support, please record the following specifics about your installation:



## 1.4 Features

The MPA400 comes in a wall mounted housing that includes ½" trade size knockouts.







The inside of the housing contains a sophisticated CCA to power HyperSpike<sup>®</sup> and other direct drive audio speakers using PoE+ or an optional AC to DC power supply. Knockouts (1/2" trade size) are available on each side of the housing for all external connections (speaker out, PoE+, AC power input).



Figure 2: Internal Housing Detail





# 1.5 Specifications

Dimensions	4.7" W x 8.8" H x 1.6" D	
Dimensions	(119.4mm W x 223.5mm H x 40.6mm D)	
Weight without Batteries	< 2 lbs.	
Enclosure	NEMA 1 / IP54	
Temperature Range	0°C to 50°C	
Compatible Speakers	Line Wave and TCPA-10 (Direct Drive) speakers up to 40W	
Power (Auto Switching)	Power over Ethernet (PoE+ / 4PPoE) or 24VDC	
Power Rating (PoE/PoE+)	20 Watts Max (802.3AT) / 40W max (802.3bt)	
Ethernet Interface	RJ45 100/1000 Mbit auto detect (IPv4 and IPv6 capable)	
Network Configuration	Automatic IP configuration on open networks	
User Interface	Graphical User Interface for Setup and Control	
Divited Audia Formate	MP3 CBR/VBR, up to 320 kbps, 848 kHz sample freq.	
	AAC-HE (AAC, AAC plus, AAC plus V2)	
Digital Audio Formats	PCM linear 16bit @8, 16, 22.05, 24, 32, 44.1, 48 kHz	
	G.711/ G.722 / GSM / Opus	
Emorgonov Notification Competibility	Stored Message Playback, Auto Registration with	
Emergency Notification Compatibility	common ENS Platforms, InformaCast, Syn-Apps, *Other	
Health and Status (Visual)	LED Status Lights – Physical Reset Button	
Security	HTTPS Secure Connection	
IP Addressing	DHCP / Static	
Internal Track Storage	1GB storage	
Contact HyperSpike for more details https://www.ultra-hyperspike.com/contact/		

\* Contact HyperSpike for more details https://www.ultra-hyperspike.com/contact/

**Table 2: Specifications** 





# 2. MOUNTING THE MPA400 SYSTEM

## 2.1 Mounting

The MPA400 uses a NEMA 1 housing and is to be located indoors in a climate-controlled building. When mounting the housing, note the CCA orientation in the housing. It is recommended that the housing is mounted such that connections are made on the same end as the connectors on the CCA. Fasten the MPA400 to the wall surface using appropriate fasteners for the wall. Always follow local codes and safety practices. *Wall fasteners not included.* 



Figure 3 – Mounting



# 3. MAKING CONNECTIONS

The MPA400 system is configured such that connections are made through the conduit knockouts. It is recommended that connections are made on the same end as the connectors on the CCA. See Figure 4 for reference. Although connections can be made in other locations, appropriate space and wire routing mechanisms are not provided when routing into other locations.



Figure 4 - Recommended Connection Locations



When making outside connections, ensure proper protection and damage prevention actions are taken to avoid impacting internal components. Tools making inadvertent impact with internal component or metal shavings could result in functional issues void of product warranty.



Lors de l'établissement de connexions à l'extérieur, assurez-vous que des mesures de protection et de prévention des dégâts soient prises pour éviter d'endommager les composants internes. Des outils ayant un impact accidentel avec des composants internes ou des copeaux métalliques pourraient entraîner des problèmes fonctionnels qui ne seraient pas sous garantie.





# 3.1 Connecting HyperSpike® Speakers

The MPA400 includes a 4-position output connector that will accept 16-26 AWG wire. See Figure 5 for speaker output connections. Install positive (+) speaker wire(s) in pin 3 (red wire shown) and negative speaker wire(s) in pin 4 (black wire shown).

Note: Wire colors are for reference only, see speaker manual for wire color and polarity.



**Figure 5 - Speaker Connection** 



Ensure wires are installed with proper polarity. Improper polarity between various channels will negatively impact speaker performance.





# 3.2 Connecting to a Wired PoE Network

The MPA400 has a standard RJ45 network jack and requires a standard Ethernet cable (CAT5e or better). If optional 24 VDC power is not used, the network connection will need to provide PoE+ or 4PPoE power.



Figure 6 - Network Connection

## 3.3 Connecting Optional 24VDC Power Supply

The MPA400 includes a 2-position input connector that will accept 16-26 AWG wire. See Figure 7 for power supply connections. Install positive (+) power wire in pin 1 (red wire) and negative power wire in pin 2 (black wire). Wire colors shown are for reference only.



Figure 7 - 24VDC Connection



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# 4. COMMISSIONING

## 4.1 Post Installation System Check

- 1) Check to ensure all wiring connections are secure:
  - Speaker wiring (check polarity of each speaker connection)
  - Network Connection
  - 24VDC Power (Optional)
- 2) Verify Network connections and that a DHCP Server is available within the network.

## 4.2 Power-up Sequence

- 1) Enable Power
- 2) MPA400 will acquire an IP Address and announce it on the speaker output.
- 3) By default, the device will announce itself to a Syn-Apps System, System Status LED and Application Status LED turn solid.

### 4.3 Managing Sources and Use of the MPA 400

- 1) Login
  - a. Use your web browser to log into the MPA400 Web Interface by typing the IP Address into your browser.
  - b. Use the user "admin" and the appropriate password provided on the sticker on the backside of the device.

#### 2) Configure your Sources

For the configuration of your sources, the following source types are available:

- Syn-Apps  $\rightarrow$  Announces the MPA400 as an audio device in a Syn-Apps system
- Barix Radio  $\rightarrow$  Plays Barix Radio as http stream without any further configuration
- RTP  $\rightarrow$  Configures the MPA400 to receive an RTP stream
- HTTP  $\rightarrow$  Configures the MPA400 to receive an HTTP stream
- SIP  $\rightarrow$  Configures the MPA400 to be a SIP client
- Local File  $\rightarrow$  Allows to play audio files which are locally stored on the MPA400





Please refer to the help description in the user interface to properly configure your sources.

Please refer to the help description in the user interface to properly configure your sources.

Individual Volume can be set for each of the sources.

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Settings Sources Audio Files Speaker Status System Status Logs Defaults	Update Reboot IPFormer_TPA400 MAC 00:08:E1:08:06:23 FW 2.0.0
IP Speaker	BARIX
Sources Input Sources Priority Table Import Export	<ul> <li>Import</li> <li>Import definitions of sources exported by another device. After import, you have to submit the changes to take effect.</li> <li>Export</li> <li>Exports definitions of sources. Only available as long as there are no changes</li> </ul>
Image: Sign of the second s	Enabled Enable or disable source Priority Sets the source priority. If two sources have the same priority, no specific behaviour is guaranteed. Type of source to use: • Barix Radio - Barix Radio. • Loca file - Play a local file triggered by UPD. • InformaCast - InformaCast audio. • RTP - RTP stream. • SynApps - SynApps audio. • SIP - Receive SIP phone call.
Volume       90%         Image: start star	Name User friendly name for source. Sources Config Sets the configuration parameters for source in format "key": "value" separated by commas. Selecting a source type will show the required config settings for that source type. Baric Radio - No parameters needed. InformaCast URL The URL of InformaCast service. Can be empty to use auto discovery. The Grmat can is "http[s]://server?[c-port>] [/c-path>]". UDL audio adversonce the "InformaCast URL" is specified, you can specify the RTP stream for the IDLE audio. If left empty, there will be no IDLE audio format1DLE audio format. Local File Tigger UDP port Port (between 8000 and 8999) to receive the UDP datagram to trigger audio file play. Audio file must be uploaded in the "Audio file" tab. The type of datagram message is so



#### 3) Prioritize you Sources

Multiple sources can be configured at the same time and are played according to their given priority.

- Priority 1: Highest priority
- Priority 5: Lowest priority

Management of priority means that a present stream will be played over another configured stream.





#### **Example of a Priority System**

- Priority 3: HTTP Radio Stream playing Background music.
- Priority 2: RTP Streams playing adds over the background music. Background music will stop as soon as the RTP stream is present
- Priority 1: SIP call playing emergency calls. Background music or add will be stopped as soon as SIP call is present.

#### 4) Manage Local Files

Use the menu item "Audio Files" to manage your local files for the source type "Local Files".

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Settings         Sources         Audio Files         Speaker Status         System Status         Logs         Defaults         Update         Reboot	IPFormer_TPA400_MAC 00:08:E1:08:06:23_FW 2.0.0
IP Speaker	BARIX
Audio files	Help
Audio files available to play with "Local file" source type.	Audio Files
Upload audio file	Upload audio files to be available to be played as a "Local File". After upload the
Upload audio files to use with local file source type. Maximum upload size is 16384 KB.	audio file, it can be played sending a UDP packet to the configured port, with content: FILEPLAY=myFileName.mp3
Upload	There's a "play" button near each audio filename that allows to play it immediately. It will play that file until the end.
Files on device:	
Internal	
select all select none delete selected	
□ ▶ 171.6K AB00391755_01_Fehlalarm.mp3	
<ul> <li>▶ 216.3K AB00391755_02_Evakuation.mp3</li> <li>▶ 223.1K AB00391755_03_Schulzimmer.mp3</li> </ul>	
C ⊾ 55074 V00031102 002000000000	

#### Figure 9 - Audio Flles Page

Note: Only MP3 Files are supported for Local Files at the time.

#### 5) Control the MPA400

Once the sources are configured, the MPA400 will start playing them accordingly. Master Volume of the MPA400 can be controlled on the "Settings" page of the web interface.





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Settings         Sources         Audio Files         Speaker Status         System Status         Logs         Defaults         Update         Reboot	IPFormer_TPA400_MAC 00:08:E1:08:06:23_FW 2.0.0
IP Speaker	BARIX
Device Alias Master Volume 50% + Network Settings	A Belp Device Alias Define a alias for the device. Useful for distinguishing multiple devices on the same network and browser favorites. Need to reload page to view changes.
+ Time Settings	Network Settings Use Avahi discovery If set to "yes", the Avahi discovery daemon is actived.
+ Security Settings Cancel Submit	This daemon implements zero-configuration networking, including a system for multicast DNS/DNS-SD service discovery Default: "no" Use SonicIP <sup>®</sup>

Figure 10 - Settings Page

#### 6) Monitor the MPA400

The "Source Status" page on the web interface will show you the actual status of the sources of the MPA400. Every source status also includes a counter indicating how many times the actual source has been played.

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Settings Sources Audio Files Speaker St	atus System Status Logs	Defaults Upda	te Reboot		IPFormer_TPA400 MAC 00:08:E1:08:06:23 FW 2.0.0
IP Speaker					BARIX
Speaker Status				Help	
				Speaker Status	
SIP Emergency					enabled sources. Sorted by priority, showing what is lata and what is not receiving data.
Registered Play count	Yes 0				enabled sources may not be displayed, as they are not
Add Channel   rt Play count	p 0				
Barix Radio   HT Play count	TP 1				

Figure 11 – Speaker Status Page

## 4.4 Security Settings

These settings are among the most important in the Settings page of the MPA400. In this section it is possible to Enable/Disable key functionalities:

- **Reboot:** Enable or disable the soft reboot from web user interface (button grayed out)
- **Reset Factory Default:** Enable or disable the possibility to reset the device to factory defaults from web user interface (button grayed out)

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• **Update Function:** Enable or disable the possibility to update the device from web user interface (button grayed out)

## 4.5 Network Settings

In the MPA400 Settings page there are parameters used to configure your device with the desired network settings. To set the network settings:

- 1) Wire your MPA400 to a network where a DHCP server is available and switch it on, hear the IP announced over the audio output (SonicIP® function) and connect to its web browser.
- 2) Locate the Network Settings in the "Settings" menu.
- 3) Once settings are configured as desired click on Submit at the bottom of the page, the device will restart and if the IP is changed you must input the new address in the top bar

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Settings         Sources         Audio Files         Speaker Status         System Status         Logs         Defaults         Update         Reboo	IPFormer_TPA400_MAC.00:08:E1:08:06:23_FW 2.0.0
IP Speaker	BARIX
Device Alias	Help Device Alias
- Network Settings	Define a alias for the device. Useful for distinguishing multiple devices on the same network and browser favorites. Need to reload page to view changes. Network Settings
Use Avahi discovery (© No () Yes Use SonicIP () No (© Yes SonicIP Volume 70% Web Protocol () HTTP V	Use Avahi discovery If set to "yes", the Avahi discovery daemon is actived. This daemon implements zero-configuration networking, including a system for multicast DNS/DNS-SD service discovery Default: "no"
Obtaining IP method     DHCP       DHCP Host Name	Use SonicIP <sup>®</sup> If set to "yes", the device will announce its IP address over the audio output. Default: "yes" SonicIP <sup>®</sup> Volume
+ Time Settings	Sets the volume at which the SoniclP $^{\rm 8}$ will be announced at boot. Default: "50 %"
+ Security Settings	Protocol Select "DHCP" for automatic assignment of IP address, Netmask, Gateway and Primary/Alternative DNS. Select "Static" for manually assigning IP address, Netmask, Gateway and Primary/Alternative DNS.

Figure 12 - Settings Page - Network Settings

## 4.6 Update the Firmware of MPA400

It is always good practice to run the latest firmware on the MPA400. The latest Firmware includes improvements and bug fixes. The firmware on the MPA400 can be updated using the local web interface.

To update the firmware from the web user interface you need first to download the TAR package from the Barix website: www.barix.com/downloads (Firmware is under Products  $\rightarrow$  Decoder  $\rightarrow$  IP Former) or simply type: IP Former in the search bar in the same page. In this page, only the latest firmware from Barix is available.





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Settings Sources	Audio Files Speaker Status System Status Logs Defaults Update Reboot	IPFormer_TPA400 MAC 00:08:E1:08:06:23 FW 2.0.0
IP Speaker		BARIX
Update		Help
	uctions before applying the update. Here to start the update	Input Sources Priority Table Definition of the sources that will be played according to the priority assigned. Changing any parameter will only take effect after submit. Update
Currently Loaded	Version	Click on "Please click here to start the update" link. On the next page click "Browse" to select the tar file to be uploaded, then click "Upload" button to start the process.
Firmware 2.0.0		An update progress page will appear. The update can take a few minutes to complete.
Root File System built 20200806163657		After a successful upload the following text appears:
System WEB UI Kernel Details	1.13 Linux version 5.5.8-yocto-standard (oe-user@oe-host) (gcc version 9.2.0 (GCC)) #1 SMP PREEMPT Wed Aug 5 15:19:28 UTC 2020	"application successfully loaded"
Bootloader Details	U-Boot 2017.03-g8537ddd (Sep 13 2018 - 19:47:54 +0200) Allwinner Technology	Click on <i>Update</i> to go back to the update page and finish the process. <b>NOTE:</b> Please clear the cache or restart your browser to ensure the web interface of your device is displayed correctly after the update.
		Currently Loaded Version In this section you can read what are the Firmware and Kernel versions that you have currently installed on your device.

#### Figure 13 - Update Page

#### Once the package is downloaded:

- 1) Connect to the MPA400's web user interface
- 2) Navigate to UPDATE from the top bar
- 3) Click on "Please click here to start the update"
- 4) In the following page click on "Browse", locate the TAR package you just downloaded on your PC and open it
- 5) Click on "Upload" Wait few minutes while the process moves forward. Do not switch off the device while the process is ongoing
- 6) When finished the message "Update completed" appears
- 7) The device will automatically reboot. After the device reboots, click on the home button and refresh the page. You may need to empty the cache of your browser to display the new application.

### 4.7 Restore Factory Defaults

There 2 reset methods available on the MPA400:

- Soft reset from web user interface
- Hard reset from the front Reset button on the device





#### Soft Reset

A soft reset restores all parameters except the network settings. To reset the device including network settings perform a Hard Reset.

- 1) Connect to the web user interface of the MPA400 and navigate to the DEFAULTS tab.
- 2) Click on Reset Factory Defaults to perform a reset of the device.

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Settings         Sources         Audio Files         Speaker Status         System Status         Logs         Defaults         Update         Reboot	IPFormer_TPA400_MAC 00:08:E1:08:06:23_FW 2.0.0
IP Speaker	BARIX
Factory Defaults	Help
	Factory Defaults
Reverts all settings to factory defaults.	Click on "Reset Factory Defaults" to revert all settings except "Network settings" to the factory defaults.
Reset Factory Defaults	A local user can completely reset the device to factory defaults (Hardware Reset) including Network settings pressing the RESET button in the front plate of the device during approximately 10 seconds.
	<b>NOTE:</b> The button will be grayed if the "Reset Factory Defaults" function is disabled from the Security Settings page.

#### Figure 14 - Defaults Page

#### **Hard Reset**

A hard reset restores all values and settings on the MPA400. To perform a hard reset:

- 1) Press the reset button located in the front panel of the device for approximately 10 seconds.
- 2) The green LED will flash 3 times to confirm reset operation.
- 3) Once the process is complete, the device will reboot.
- 4) The network settings will have been restored.

Note: The IP address may have changed, listen to the SonicIP® announced over the audio output to verify IP address.





# 5. HEALTH AND STATUS MONITORING

## 5.1 Status LEDs

The MPA400 has 2 LEDs visible form front of the housing. These LEDs provide system and applications status. See Tables 5 and 6 for status descriptions



#### Table 3: System Status

LED Color	LED Status	Status Description
Red Fast Flashing		Early Startup
Red	Slow Flashing	System Booting
Yellow	Flashing	System in Rescue Mode
Orange / Yellow	Flashing	Downloading / Installing Firmware
Green	Solid	System Ready

#### **Table 4: Application Status**

LED Color	LED Status	Status Status Description	
Red	Solid	Application Not Running	
Green	Solid	Application Running	



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# 6. MAINTENANCE AND TROUBLESHOOTING GUIDE

## 6.1 Recommended Maintenance

On a regular basis, check the system:

- Check for vandalism or natural damage.
- Check speaker wiring for frays, cuts, and kinks.
- Perform an operational test.

## 6.2 Troubleshooting Guide

- For amplifier module related issues:
  - Refer to Section 5.1 to verify system status.
  - If no LEDs are illuminated, verify power is provided by a compliant PoE+ or 4PPoE network connection, or optional 24 VDC power source. Refer to Section 3.2 and 3.3
  - Verify network is connected and configured properly. Refer to Section 3.2
- For speaker related issues:
  - Verify speaker is properly connected to MPA400. Refer to Section 3.1
  - For additional troubleshooting, refer to the associated product manual.

For any other issues, contact customer service. For accurate and expedient customer service, please have the following information readily available when contacting Ultra:

- Model number
- Serial number
- Purchase date



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# 7. WARRANTY

Ultra Electronics – USSI warrants that its products shall conform to the published specifications as of the date of order and shall be free from defects in material and workmanship.

Upon receipt of the returned product(s), Ultra Electronics – USSI will repair or replace any and all product(s) at its discretion. Ultra Electronics – USSI will not issue a credit for product(s) returned through the Return Authorization process. This warranty is extended to the original purchaser and all subsequent owners, provided a copy of the original dated bill of sale is presented when service is requested under warranty.

#### HyperSpike<sup>®</sup> Warranty Period

Such warranty shall extend for a period of one (1) year from the date of shipment from USSI's facility.

#### How to obtain service under this warranty

If your product(s) should require service, please write, phone, fax, or email us at:

Ultra Electronics – USSI 4868 East Park 30 Drive Columbia City, Indiana, USA 46725 Phone: 260-248-3665 Email: ServiceDepartment@ultra-ussi.com

Ultra Electronics – USSI will provide a Return Material Authorization (RMA) number so that you can ship the product(s) to our factory. Do not ship the product(s) to us without first obtaining an RMA number. Place the RMA number on all boxes returned to the factory. You are responsible for transporting your product(s) to our factory. We will pay the return shipping charges on all product(s) repaired under warranty.

#### Failures not covered by this warranty

This warranty covers defects in manufacture only. It does not cover:

- 1. damage caused by accident, misuse, abuse, product modification, or neglect;
- 2. damage incurred during shipment (you must claim these damages from the carrier);
- 3. damage resulting from failure to operate the product in accordance with the instruction manual; or
- 4. damage resulting from attempted repairs by unauthorized personnel.

#### **Exclusion of certain damages**

Ultra Electronics – USSI's liability is limited to the repair or replacement, at our option, of any defective product(s) and shall in no event include indirect, consequential, incidental, punitive, or special commercial damages of any kind. Some states do not allow the exclusion or limitation of indirect, consequential, incidental, punitive, or special damages so the preceding limitation or exclusion may not apply to you.

#### Warranty after repairs

An additional warranty of ninety (90) days will be extended to any parts that were repaired or replaced. The original standard warranty or any extended warranty that was purchased at the original time of sale of the product(s) is still in effect for the remainder of the warranty term.

