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MRA-470D

IPX7 4 Channel Marine-Grade Micro Digital Amplifier

The MRA-470D is a state-of-the-art amplifier designed to deliver great performance from a small 203 x 89mm/ 8” x 3.5” footprint.

This 4 channel full-range class D amplifier benefits from an IPX7 waterproof rating ensuring that it is suited to the harsh marine environment, optimised for a boat, jet-ski or off-vehicle application.

MRA-470D boasts fully variable high pass and low pass crossovers enabling it to drive loudspeakers in a variety of configurations. A versatile and powerful amplifier to sit at the heart of your high-end audio system.

In the box

- MRA-470D Amplifier
- Waterproof DIN > RCA adaptor cable
- Power cable & 40A fuse
- Mounting Screws

Read this document in full before proceeding with installation.

Installation should only be performed by an experienced and qualified technician.

Owner’s Manual & Set-up Guidance

Specification

Power output at 4Ω - 70W x 4
Power output at 2Ω - 90W x 4
Power output at 4Ω Bridged - 200W x 2
Size L x W x H: 20.3 x 8.9 x 3.8cm (8 x 3.5 x 1.5”)

Colour	Function	Connection
Red	+ 12v	Input
Black	Ground	Input
Blue	*Remote: Do Not Connect*	
Speaker Outputs		
Green/Black	Rear Left -	Output
Green	Rear Left +	Output
Purple	Rear Right +	Output
Purple/Black	Rear Right -	Output
White/Black	Front Left -	Output
White	Front Left +	Output
Grey	Front Right +	Output
Grey/ Black	Front Right -	Output
RCA Adaptor		
Phono Cable	Signal	Input
Yellow	+12v **(Max Current draw 300mA)**	Output
Blue	Remote	Input
Black	Ground	Output

***** Wiring configuration diagram overleaf *****

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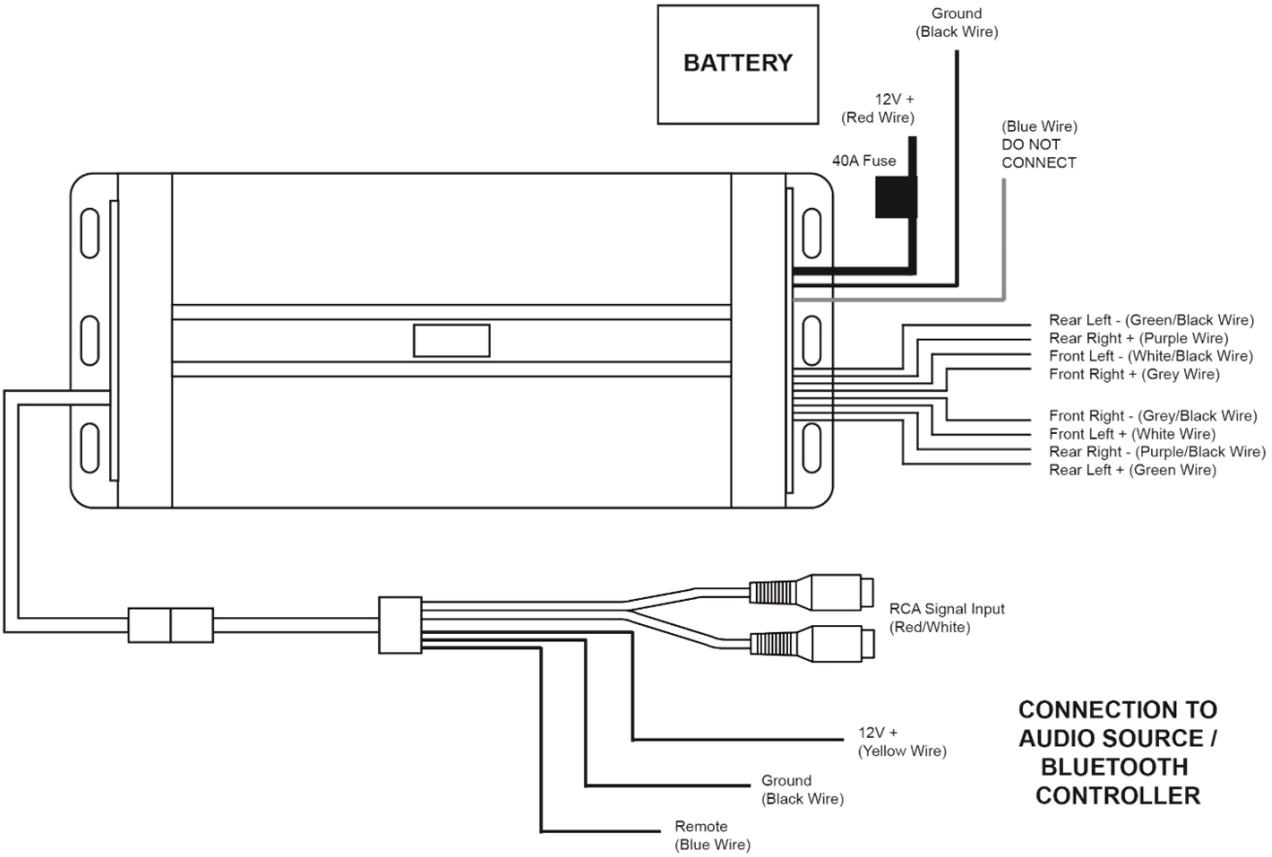

CONNECTION TO AUDIO SOURCE / BLUETOOTH CONTROLLER

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Important Safety Information

A.) Water damage caused by improper installation procedure is not covered by warranty.

Our engineering team designed this amplifier chassis to be IPX7 waterproof rated however it must be installed where its protected from water/mud at all times.

The sealed structure is designed and constructed to protect the amplifier in case it accidentally gets wet. It is the responsibility of the owner/ installer to limit the amplifier's exposure to wet areas, especially immersion.

- Install the amplifier in a dry area where water cannot reach it
- Do not clean the amplifier with a high pressure hose.

B.) Do not use the Blue remote-in wire (labelled 'do not connect' in the diagram on the previous page) within the input harness when using a Celsus Bluetooth controller as your audio source. The amplifier utilises a remote trigger within the RCA adaptor provided.

If you are in any doubt please contact our technical support technical@celsusgroup.net

C.) Installation Application
MRA-470D is designed for operation with 12 volts, negative ground electrical systems. Using this product in systems with positive ground and/or voltages other than 12v may result in damage to the product and void all warranty.

D.) Safety Considerations
Having an amplifier sealed to the elements at IPX7 rating means that the heat generated from the amplifiers normal function has nowhere to escape. When played for extended periods the amplifier chassis may get hot, this is perfectly fine and expected but avoid touching the amplifier surface during or right after use.

Do not mount the amplifiers in the engine compartment or any other areas of extreme heat. Mounting the amplifier in the engine compartment will void all warranty.

Securely mount the amplifier so that is will not come loose in the event of a collision/ sudden jolt or as a result of repeated vibration during normal operation of your vessel or vehicle.

Check before drilling to make sure that you will not be drilling into an exterior panel/ hull, fuel tank, fuel/ brake line, wiring harness or any other vital system.

Do not run system wiring outside or underneath the vessel/ vehicle. This extremely dangerous practice can result in severe damage or injury. Your system should be installed by a professional technician.

Protect all system wires from sharp edges (metal, fibreglass etc.) by carefully routing them, tying them down and using grommets where applicable. Secure all wiring as needed using cable ties or wire clamps to protect them from moving parts.

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E.) Battery and charging

When setting up and tuning the system it will be drawing current from the battery. Monitor the battery voltage from time to time and recharge if it gets low.

Aftermarket audio equipment such as this amplifier will put an increased load on the vehicle's battery and charging system. We recommend checking your alternator and battery condition to ensure the electrical system has enough capacity to handle the increased load of your stereo system.

Stock electrical systems which are in good condition should be able to handle the extra load of the MRA-470D amplifier without problems, although battery and alternator life can be reduced slightly. To maximise the performance of your amplifiers we suggest the use of a heavy-duty battery.

F.) Installation Procedure / Connections

The installation of this product should be undertaken by an experienced technician.

- Before installation disconnect the negative battery post connection and secure the disconnected cable to prevent accidental reconnection during installation. This is an essential safety precaution during installation.
- Avoid running power wires near the low-level input cables, antenna, power leads, sensitive equipment or harnesses. The power wires carry substantial current and could induce noise into audio system.

1. Connect RED power lead to the positive (+12V) battery post.
2. We strongly recommend to run the Black/Ground cable to the negative (-12V) battery post.
    a. Blue/Remote turn-on (in the power harness) should not be used. The RCA Adaptor contains a remote trigger wire for turn-on.
3. Fuse. The amplifier already includes a 40A fuse. The MRA-470D power wires are 2.4M (8ft) long, while the fuse housing located on the Red positive power cable is located at 1.5M (5ft) of wire from the amplifier.
    a. It is recommended that the fuse holder is located within 40cm of the battery positive terminal
4. Run the speaker wires to the amplifiers output. Make sure correct polarity when connecting your speakers to the amplifier. Speaker connection colour codes.

Speaker Outputs		
Green/Black	Rear Left -	Output
Green	Rear Left +	Output
Purple	Rear Right +	Output
Purple/Black	Rear Right -	Output
White/Black	Front Left -	Output
White	Front Left +	Output
Grey	Front Right +	Output
Grey/ Black	Front Right -	Output

5. Secure the amplifier
6. Connect the RCA adaptor harness to the Amplifier and connect directly to the Celsus BTC10-001 Controller as follows;

RCA Adaptor	BTC10-001
Yellow	Red
Black	Black
Blue	Blue
RCA	RCA

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(Point 6 continued…) The RCA adaptor harness Power, Ground & Remote connections can only be used with the Celsus BTC10-001 and must not be used with any other product.

The Amplifier can be damaged by connecting the RCA Adaptor harness Power, Ground & Remote to any other product (other than BTC10-001) and will not covered by warranty.

If the Amplifier is to be connected to another product (not the BTC10-001) then the Power, Ground & Remote must not be connected to the RCA Adaptor harness and an alternative power source located (i.e. the battery) and the Remote input connected to the Blue wire that is part of the "main amp supply harness".

7. Power up system & check the control panel setting. (section G)

For troubleshooting see end of manual.

G.) Control Panel Settings & Adjustments

The amplifier's settings and controls are located on the side panel beneath a gasketed, protective cover. Remove the five Allen head screws from the centre panel to access the controls and make adjustments. Replace cover when finished and secure amplifier.

Amplifier set-up and gain adjustment is critical to a great sounding audio system and should be undertaken by an experienced specialist. This will avoid distortion and potential damage to your speakers.

Power/ Protect Indicator

This indicator will light up RED upon initial amplifier start up. If all connections are ok, within 3-5 seconds the light will turn BLUE. If a condition of protect (short circuit, over/ under voltage) occurs the light will turn RED until the condition of protect is resolved.

Control Panel settings

The control panel settings required on the amplifier depending on the system design (speaker / subwoofer configuration.

This amplifier can be used in three modes

- 4 stereo loudspeakers
- 2 stereo loudspeakers (Bridged front & rear channels)
- 2 stereo loudspeakers and 1 subwoofer (Bridged Mono rear output)

Always check compatibility of the equipment being used. Your speakers / subwoofer must be able to handle the continuous power of the amplifier.

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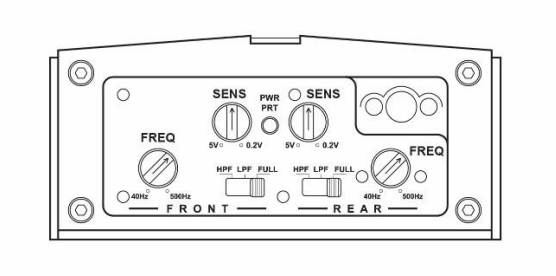
In all modes and configurations the input gain (**SENS**) should be tested and tuned in accordance with the speakers and audio source used. This requires a multi-meter. GAIN IS NOT VOLUME CONTROL.

Gain (SENS) is used to match the input of the amplifier to the source unit. The higher the sensitivity the sooner the amplifier will reach maximum output.



- **'FREQ'** (Crossover control) The variable crossover on the amplifier allows the adjustment of cross over frequency
- **'HPF'** (High Pass Filter) configures filter to attenuate frequencies below the selected filter frequency
- **'LPF'** (Low Pass Filter) configures the filter to attenuate frequencies above the selected filter frequency
- **'FULL'** Full Range operation of all frequencies.

H.) Troubleshooting

Problem	Cause	Solution
Does not sound right	Speaker are not connected correctly	Refer to experienced installer
	Control panel settings are wrong	
Amplifier does not turn on	Controller/ Head unit was not on	Turn on source
	Faulty Fuse	Remove fuse and check continuity. Replace fuse if necessary
	Poor connection integrity	Check '+12V' and 'Ground' cables for pinched wires. Ensure tight connections.
Balance reversed	Speaker L & R reversed	Correct speaker wire orientation
Output distorted	Volume set too high at source	Lower volume
	Amplifier gain set too high	Lower gain (SENS)
Whining or ticking noise while the engine is ON	Amplifier is picking up alternator or radiated noise	Move audio cable away from power cables
		Turn down input gain (SENS)
		Check the alternator and/or voltage regulator. Test for weak battery.

Specifications

Output power at 4 OHM	70W x 4
Output power at 2 OHM	120W x 4
Output power at 4 OHM Bridged	200W x 2
Waterproof level	IPX7
Total Harmonic Distortion	<1%
S/N Ratio Ref 1W @ 4 OHM	>90dB
Gain Range	0.2V – 5V
Crossover Range	40Hz – 500Hz
Frequency Range	20Hz – 20KHz

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