

# APC100 MK2

## User Manual



[www.audac.eu](http://www.audac.eu)



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# Introduction

## Universal configuration & control unit

The APC100MK2 is a configuration and control unit for use in combination with a wide variation of controllable AUDAC and 3rd party devices, ranging from matrix systems and mixers to paging consoles, wall panels and many more.

Featuring various kinds of communication ports including TCP/IP, RS232 & RS485, it can create a connection between various connected devices in your installation. The selectable baud-rate allows compatibility with a large number of compatible devices.

It makes the installers life easier and time saving. Complex system configurations and updates can be made in a moment, as well as back-ups and duplicates. Specific files such as voice-file messages and screensavers can be uploaded without requiring no more than the APC100MK2 and a computer. An internal real-time clock allows synchronizations for time controlled events in external devices. (When synchronized with internet time server)

The AUDAC system manager software application allows the user to manage and control APC100MK2's functions together with full configuration functionalities for any 'smart' connected devices. (through TCP/IP, RS232 or RS485)

In addition it can also be used as a standard gateway receiving serial communication and converting into TCP/IP format and reversed. This allows system integration for devices such as audio sources & power amplifiers without integrated network capabilities to be implemented into your automation system. Using the freely available AUDAC Touch™ application and the APC100MK2, total system control for 3rd party devices is made possible.

# Precautions

## READ FOLLOWING INSTRUCTIONS FOR YOUR OWN SAFETY

ALWAYS KEEP THESE INSTRUCTIONS. NEVER THROW THEM AWAY

ALWAYS HANDLE THIS UNIT WITH CARE

HEED ALL WARNINGS

FOLLOW ALL INSTRUCTIONS

NEVER EXPOSE THIS EQUIPMENT TO RAIN, MOISTURE, ANY DRIPPING OR SPLASHING LIQUID. AND NEVER PLACE AN OBJECT FILLED WITH LIQUID ON TOP OF THIS DEVICE

NO NAKED FLAME SOURCES, SUCH AS LIGHTED CANDLES, SHOULD BE PLACED ON THE APPARATUS

DO NOT PLACE THIS UNIT IN AN ENCLOSED ENVIRONMENT SUCH AS A BOOKSHELF OR CLOSET. ENSURE THERE IS ADEQUATE VENTILATION TO COOL THE UNIT. DO NOT BLOCK THE VENTILATION OPENINGS.

DO NOT STICK ANY OBJECTS THROUGH THE VENTILATION OPENINGS.

DO NOT INSTALL THIS UNIT NEAR ANY HEAT SOURCES SUCH AS RADIATORS OR OTHER APPARATUS THAT PRODUCE HEAT

DO NOT PLACE THIS UNIT IN ENVIRONMENTS WHICH CONTAIN HIGH LEVELS OF DUST, HEAT, MOISTURE OR VIBRATION

THIS UNIT IS DEVELOPED FOR INDOOR USE ONLY. DO NOT USE IT OUTDOORS

PLACE THE UNIT ON A STABLE BASE OR MOUNT IT IN A STABLE RACK

ONLY USE ATTACHMENTS & ACCESSORIES SPECIFIED BY THE MANUFACTURER

UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME

ONLY CONNECT THIS UNIT TO A MAINS SOCKET OUTLET WITH PROTECTIVE EARTHING CONNECTION

THE MAINS PLUG OR APPLIANCE COUPLER IS USED AS THE DISCONNECT DEVICE, SO THE DISCONNECT DEVICE SHALL BE READILY OPERABLE

USE THE APPARATUS ONLY IN MODERATE CLIMATES



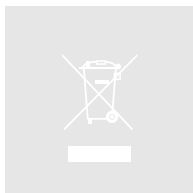
### CAUTION – SERVICING

This product contains no user serviceable parts. Refer all servicing to qualified service personnel. Do not perform any servicing (unless you are qualified to)



### EC DECLARATION OF CONFORMITY

This product conforms to all the essential requirements and further relevant specifications described in following directives: 2014/30/EU (EMC) and 2014/35/EU (LVD)



### WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

The WEEE marking indicates that this product should not be disposed with regular household waste at the end of its life cycle. This regulation is created to prevent any possible harm to the environment or human health.

This product is developed and manufactured with high quality materials and components which can be recycled and/or reused. Please dispose this product at your local collection point or recycling centre for electrical and electronic waste. This will make sure that it will be recycled on an environmentally friendly manner, and will help to protect the environment in which we all live.

### CAUTION

The symbols shown are internationally recognized symbols that warn about potential hazards of electrical products. The lightning flash with arrow point in an equilateral triangle means that the unit contains dangerous voltages. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the users manual.



These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer’s warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.





# Chapter 1

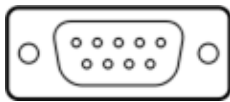
## Connections and connectors

### CONNECTION STANDARDS

The in- and output connections for AUDAC audio equipment are performed according to international wiring standards for professional audio equipment.

#### RS232 (serial connection interface):

For connection with home & industrial automation systems, controllable equipment, ...



#### Connection

**PIN 2**

**PIN 3**

**PIN 5**

Standard RS232

APC100MK2 TX

APC100MK2 RX

GND

#### Settings

19200 Baud (default)

8 Bit

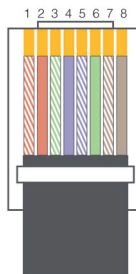
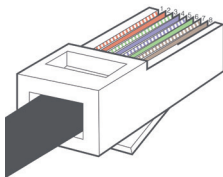
1 Stop bit

No parity

No Handshaking

#### RJ45 (RS485, Audio, +24V DC):

For connection to matrix systems / peripheral devices



<b>Pin 1</b>	White-Orange	AUDIO A
<b>Pin 2</b>	Orange	AUDIO B
<b>Pin 3</b>	White-Green	+24V DC
<b>Pin 4</b>	Blue	RS485 A
<b>Pin 5</b>	White-Blue	RS485 B
<b>Pin 6</b>	Green	GND
<b>Pin 7</b>	White-Brown	AUDIO A
<b>Pin 8</b>	Brown	AUDIO B



# Chapter 2

## Overview APC100MK2

### Front panel APC100MK2



*APC100MK2 Front panel*

Various control and configuration ports are located on the front panel of the APC100MK2 together with the 24 Volts power connection.

#### **1) 24 Volts power connector:**

24 Volts DC mains power should be applied to this connector. Connect the wires of the included power supply (PSD241) here. Mind the polarity markings when connecting the power supply.

#### **2) 'RUN' LED:**

The blue 'RUN' LED will indicate the current operation mode of the device. When the device is running in normal mode, this LED will blink with a constant frequency.

#### **3) 'RS485 + AUDIO' RJ45 connector:**

Connections to any peripheral such as wall panels, paging microphones, ... or matrix systems should be made on this data bus connector. This data bus carries all audio and control signals between the APC100MK2 and other devices. Connections should be made using twisted pair CAT5E (when using analogue audio transfer) or CAT6 (when using digital audio transfer) cabling.

This data bus is implemented twice (once on front and once on rear panel), both having identical possibilities and specifications.

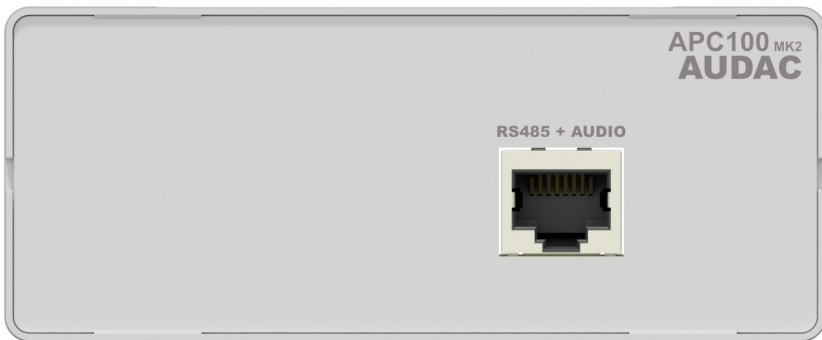
#### 4) RS232 control port:

The RS232 control port is implemented using a DB9 connector. Any communication between the APC100MK2 and external control hardware equipped with an RS232 control port can be made in this way. The pinout and communication protocol settings are described in chapter 1 of this manual.

#### 5) Ethernet connection:

The APC100MK2 is equipped with an Ethernet network connection implemented using an RJ45 connector. The green and orange LED's will indicate whether the network is connected and active. Using this port, the APC100MK2 can be connected in any LAN network.

## Rear panel APC100MK2



*APC100MK2 Rear panel*

#### 'RS485 + AUDIO' RJ45 connector:

The rear panel of the APC100MK2 contains only one data bus connection. This data bus connection has identical possibilities and specifications as the data bus connection implemented on the front panel of the APC100MK2. When a connection between the APC100MK2 and a peripheral interface or matrix system is made, the selection between both connections can be freely chosen.

The advantage of the second implemented data bus makes the APC100MK2 applicable to a connection between a peripheral device (wall panel, paging microphone, ... ) and a matrix system. In this typical application one data bus connection can be used as input while the second connection can be used as output.

# Chapter 3

## Configuring the APC100MK2

The settings are configured in the web-based user interface of the APC100MK2. To get access to these settings, it should get connected to a computer or LAN network through an Ethernet connection. For more information about network connections and settings, see IP basics in chapter 5.

The factory default IP address of the APC100MK2 is set to 192.168.0.194, make sure this address is within the IP range of the network where to its connected (sub net mask 255.255.255.0). If the default IP address is not within range of your LAN network, contact your network specialist. The IP address can be changed in the configuration settings menu but therefore a network connection must be established first!

### Configuration interface

Start your default web browser and enter the IP address of the APC100MK2 in the address bar on top. (The factory default IP address is <http://192.168.0.194>)

### Login screen

First the login screen will be displayed.

A password should be entered to get access to the configuration interface. After the correct password is entered, click the “OK” button, and you will be redirected to the configuration screen of the APC100MK2. (The factory default password for the APC100MK2 is ‘APC’)

<b>NOTE</b>
The passwords can be changed in the ‘Password settings’ menu.

# Configuration screen

After the correct password has been entered, the configuration screen of the user interface will be loaded as shown below.



*Configuration screen for APC100MK2*

This window gives an overview of the configuration settings which can be adjusted in the APC100MK2 web interface. Different icons are shown for 'Network settings', 'Password settings', 'Time settings', 'RS232 settings', 'APC100 address' and 'Factory settings'.

Click the particular button if you want to make any changes to the corresponding settings.

## Connection status

In the top left corner of the window is the connection status indicated. When an active connection is established, the connection status will indicate 'ONLINE' in a green color. When the connection was temporarily interrupted but restored, the connection status will indicate 'ONLINE' in an orange color. When the connection status indicates 'OFFLINE', there is currently no communication with the device.

# Network settings

In this window, the network settings of the APC100MK2 can be adjusted.

The IP address is standard set to 192.168.0.194 and the subnetmask is standard set to 255.255.255.0.

The settings can be changed by adjusting the parameters in the shown fields and pressing OK. Once changed, the modified settings will take effect immediately and you will be automatically redirected to the newly entered IP address.

For more information about network connections and settings, see IP basics in Chapter 5.



The screenshot shows the 'AUDAC APC100' interface with a 'Status: ONLINE' indicator. The main window is titled 'NETWORK SETTINGS' and contains the following fields:

Field	Value
IP Address	192.168.0.194
Subnet Mask	255.255.255.0
Gateway	192.168.0.253
DNS-server	8.8.8.8

At the bottom of the window, there are two buttons: 'Cancel' and 'OK'.

*Network settings screen for APC100MK2*

# Password settings

In this window the password for the APC100MK2 can be changed.



*Password settings screen for APC100MK2*

To change the password, enter the old password in the provided field and enter the new password twice in the fields below. After this is all completed, push the OK button. If the old password is correct and both new entered passwords are matching, the password will be changed in the new one.



The factory default password is **'APC'**.



# Time settings

In this window the time settings for the APC100MK2 can be changed.



*Time settings screen for APC100MK2*

The current time and date for the APC100MK2 can be configured in this window. The APC100MK2 act as a real-time-clock for synchronizing timer scheduled events with other devices connected in your network. (when they are not including their own real-time-clock)

The time and date settings (Manual clock settings) selection is done manually by selection from the drop down lists. After the correct values are selected, the 'OK' button on the bottom of the page should be clicked and the entered time & date will be saved. The internal real-time clock holding the current time and date has an accuracy of 1 minute / month, meaning the set value may expire with a maximum of 1 minute / month.

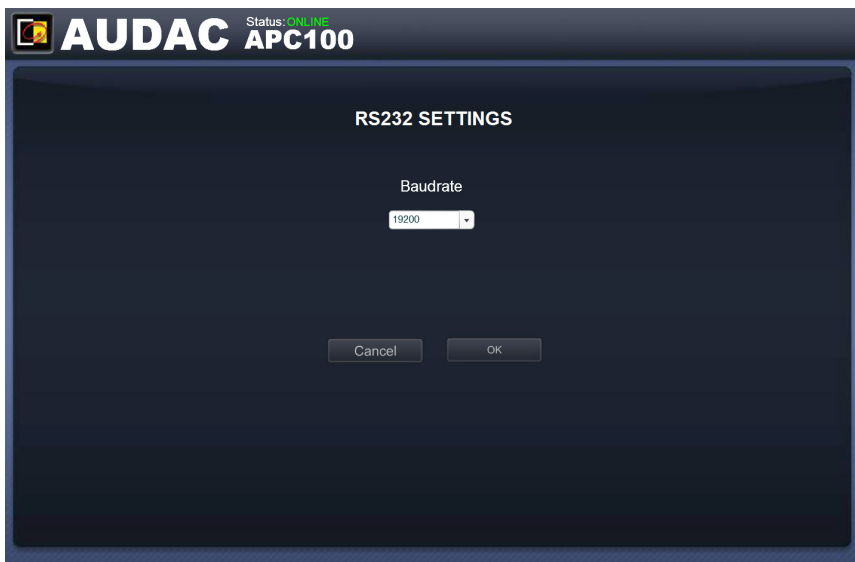
A second option is synchronizing the internal clock constantly with a public time server (time server settings). This function can be activated by clicking the 'Enabled' button. Subsequently, the time zone in which the device is located should be selected. In case the time server function has been selected, the APC100MK2 will try to synchronize every few minutes with a public time server (through internet), making sure the current set time is always accurate and won't expire.

When the APC100MK2 is connected to a LAN network without having access to internet, the APC100MK2 time server can synchronize with a 'Master' time server in your LAN network to avoid time expiring. In this case the IP address from the 'Master' time server in your network should be entered in the 'IP Address NTP server' field. In all other cases this field should be left blank.

When making changes to 'Time server settings' (timezone and/or IP address NTP server), the function first need to be disabled before any changes are made to it, and need to enable again to become effective.

## RS232 settings

In this window the RS232 settings (baud rate) for the APC100MK2 can be configured.



*RS232 settings screen for APC100MK2*

Depending of the baud rate compatibility for the connected device to the RS232 connection of the APC100MK2, the baud rate can be configured in this screen. Selection is done through a dropdown box and is possible between various baud rates for 1200 / 2400 / 4800 / 9600 / 14400 / 19200 / 28800 / 38400 / 56000 / 57600 and 115200 baud. The default configured baud rate is 19200 baud, which is functional with all other available AUDAC products. Press OK to confirm the baud rate and before the change will become effective.

# Address settings

In this window the address settings for the APC100MK2 can be configured.



*Address settings screen for APC100MK2*

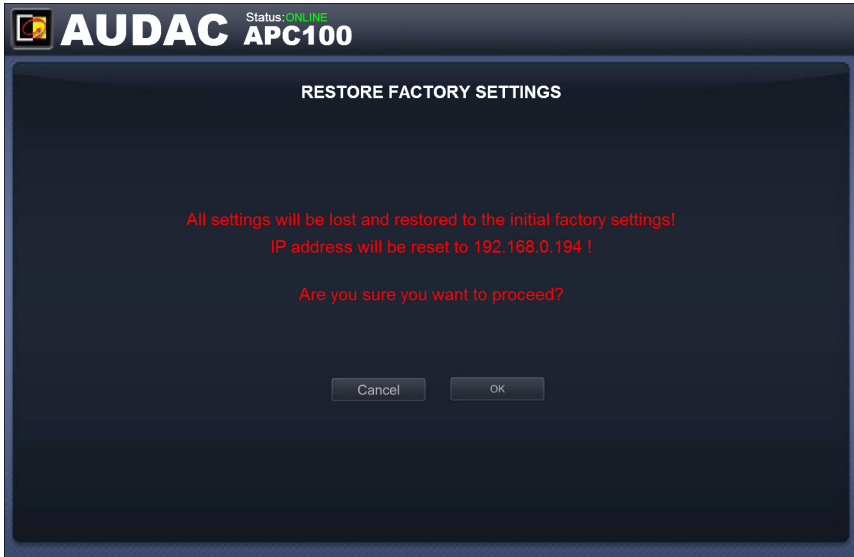
The address is default set to '001' and selectable using the drop down list in a range of '001' and '099'.

When multiple APC100MK2's are used in one configuration or installation, every APC100MK2 should have an unique assigned address. It is recommended to use address '001' for the first connected APC100MK2 and increase by one for every subsequent connected APC100MK2.

When sending commands through serial or network communication, the device address for the APC100 is always preceded by the letter 'B'. Meaning for APC100 with device address '001', destination 'B001' shall always be used when sending commands.

# Factory settings

In the factory settings menu, all settings of the APC100MK2 will be set to factory default. It does not recall the previously saved settings, but will recall the original factory settings and all previously made settings will be lost.



*Factory settings screen for APC100MK2*

When clicking the 'Factory settings' button, a warning window will appear. If you proceed by clicking the 'OK' button, all settings will be returned to factory default values.

## ATTENTION

**BE CAREFUL** to press this button. All original factory settings will be recalled and all custom settings will be lost.

# Chapter 4

## Using the APC100MK2

The APC100MK2 universal configuration & control unit is a multifunctional device which can be used as a configuration tool for matrix systems & peripherals, while another typical application is the use as network gateway for various kinds of devices.

### Using as a configuration tool

When using the APC100MK2 as a configuration tool, it will establish the physical link between the peripheral device (wall panel, paging console, ...) and the 'AUDAC system manager' software allowing to create and upload or download specific configurations. The 'AUDAC system manager' software is freely available and can be downloaded from the AUDAC website.

This software tool (compatible with windows, mac and linux) detects all 'smart' devices with their peripherals in your system and allows extended configuration, update and backup functions of the equipment.

### Using as a gateway

When the APC100MK2 is used as a gateway, it allows connection to and control through any TCP/IP based network for all devices containing an RS232 or RS485 interface. The baud rate is configurable in the APC100 settings menu.S

The commands sent to the IP address of the APC100MK2 on port 5001 will be translated and converted to commands on the RS232 and RS485.

This way, any device containing RS232 (Eg: power amplifier) can be connected to your LAN network and controlled through an TCP/IP based automation system.

# Chapter 5

## Additional information

### IP Basics

Many AUDAC products are controllable by Ethernet. The Ethernet connection which is used on the AUDAC products is TCP/IP based like 99% of the computer networks. There are some basics which you need to know to successfully make a TCP/IP Ethernet connection.

The data in TCP/IP networks is always sent in packages, all these packages must be delivered to a unique address, just like the mailman delivers mail to your home mailbox. In TCP/IP networks, this address is called the “IP address”. The IP address is always a number in the following format “192.168.000.001”. As you can see, this address consists of 4 separate numbers ranging from “000” to “255”.

In simple terms, only the last number of an IP address can be different within a network, so there is a maximum of 256 unique addresses within a network, ranging from “xxx.xxx.xxx.000” to “xxx.xxx.xxx.255”. The first three numbers have to be the same to make communication between several devices possible, otherwise the devices can not communicate with each other.

**Example:**

Device 1:	IP address:	<b>192.168.000.001</b>
Device 2:	IP address:	<b>192.168.000.002</b>
Device 3:	IP address:	<b>192.168.001.003</b>

In this example, Device 1 can communicate with Device 2, but not with Device 3, because the first three numbers have to be the same. These first three parts are called the “IP range”, so the devices have to be in the same “IP range” to communicate with each other.

The “IP ranges” of home and office networks are defined by the network administrator, this means that the IP range of your home or office network can be different from another network. AUDAC products have the following default IP address: “192.168.0.xxx”, this means the standard IP range of AUDAC products is “192.168.000.xxx”. If your network is using a different IP range, the AUDAC products will not be accessible from your network. You can change the IP address of the AUDAC products to make them work properly in your network. This can be done in the settings menu, and is described extensively in the “Settings” chapter of this user manual.

Of course, to make changes to the settings menu of the AUDAC products, you need to have access to the user interface on the product’s web page. This can be done by temporarily giving your computer an IP address within the IP range of the AUDAC product, for example “192.168.0.193”. After the IP address of your computer is within the IP range of the product, the user interface is accessible and the IP address of the product can be changed to an IP address within the IP range of your network. If the IP address of the product is within the IP range of your network, you can change the IP address of your computer to it’s former IP address and the product should work properly in your home or office network. Ask your network administrator for help if you are not familiar with networks.

#### **Summary**

- All devices must have a unique IP address
- All devices must be within the same IP range

# Technical specifications

Data connections	Ethernet (RJ45) 2 x RS485 + Audio (RJ45) RS232 (DB9)
RS232 specifications	Baud rate selectable (Default 19200) 1200 / 2400 / 4800 / 9600 / 14400 / 19200 / 28800 / 38400 / 56000 / 57600 / 115200 Baud  8 Bit 1 Stop bit No parity No Handshaking
Power consumption	< 1 Watt
Power supply	24V DC PSD241 switching power supply included 100 ~ 240V AC / 47~63 Hz
Dimensions (W x H x D) Weight	108 x 44 x 164 mm 0.8 Kg (incl power supply)
Packaging Shipping weight & Volume	Carton box 1.12 Kg – 0.0078 Cbm
Optional accessories	MBS1xx Mounting brackets