

# APC100

## User Manual



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



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# Introduction

## Universal configuration & control unit

The APC100 is a configuration and control unit which can be used in combination with a wide variation of 'smart' AUDAC devices, ranging from matrix systems and mixers to paging consoles and wall panels.

It features different types of communication ports, such as TCP/IP, RS-232 & RS-485. This way, it can communicate with every 'smart' device connected in your installation and establish the missing link between them.

This 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 APC100 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 APC100's functions together with full configuration functionalities for any 'smart' connected devices. (through TCP/IP, RS-232 or RS-485)

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.

# Precautions

## READ FOLLOWING INSTRUCTIONS FOR YOUR OWN SAFETY

- ALWAYS KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE. NEVER THROW THEM AWAY
- ALWAYS HANDLE THIS UNIT WITH CARE
- CLEAN ONLY WITH DRY CLOTH
- HEED ALL WARNINGS AND FOLLOW ALL INSTRUCTIONS
- NEVER EXPOSE THIS EQUIPMENT TO RAIN, MOISTURE, ANY DRIPPING OR SPLASHING LIQUID. NEVER PLACE AN OBJECT FILLED WITH LIQUID ON TOP OF THIS DEVICE
- 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 WITH A HIGH LEVEL 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
- CAREFULLY CHECK THE UNIT'S CONDITION AFTER UNPACKING. IF THERE IS ANY DAMAGE TO THE CARTON BOX OR THE UNIT ITSELF, INFORM YOUR VENDOR IMMEDIATELY.
- ONLY CONNECT THIS UNIT TO A MAINS SOCKET OUTLET WITH PROTECTIVE EARTHING CONNECTION
- THE INSTALLATION, CONNECTION AND CONFIGURATION OF THE DEVICE SHOULD BE DONE BY QUALIFIED TECHNICIANS

## CAUTION

- USE CABLES OF THE RIGHT GAUGE FOR CONNECTING LOUDSPEAKERS ON THE AMPLIFIED OUTPUTS
- USE CABLES WITH CLEAR COLOUR CODING INDICATING THE POLARITY AND MAINTAIN THE SAME POLARITY THROUGHOUT THE WHOLE SYSTEM.
- ONLY USE THE CORRECT LOAD IMPEDANCE (MIN 4 OHM) WHEN CONNECTING LOUDSPEAKERS ON THE AMPLIFIED OUTPUTS. EXCEEDING THESE LIMITS COULD CAUSE FIRE OR OTHER FAILURES.
- DO NOT CONNECT INDUCTIVE LOADS DIRECTLY TO THE AMPLIFIED OUTPUTS
- AVOID ELECTRIC SHOCKS: SWITCH OFF THE AMPLIFIER WHEN CONNECTING



### 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 do so.)



### EC DECLARATION OF CONFORMITY

This product conforms to all the essential requirements and further relevant specifications described in following directives: 2004/108/EC (EMC) and 2006/95/EC (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 product life. This regulation is created to protect both the environment and human health.

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





# Chapter 1

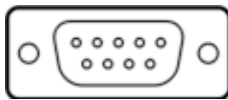
## Connections and connectors

### CONNECTION STANDARDS

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

#### RS232 (serial connection interface):

For connection with home automation systems, or other remote control equipment



#### Connection

**PIN 2**

**PIN 3**

**PIN 5**

Standard RS232

APC100 TX

APC100 RX

GND

#### Settings

19200 Baud

8 Bit

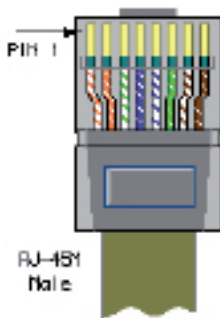
1 Stop bit

No parity

No Handshaking

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

For connection to matrix systems / peripheral devices



**Pin 1**

White-Orange

AUDIO A

**Pin 2**

Orange

AUDIO B

**Pin 3**

White-Green

+24V DC

**Pin 4**

Blue

RS485 A

**Pin 5**

White-Blue

RS485 B

**Pin 6**

Green

GND

**Pin 7**

White-Brown

AUDIO A

**Pin 8**

Brown

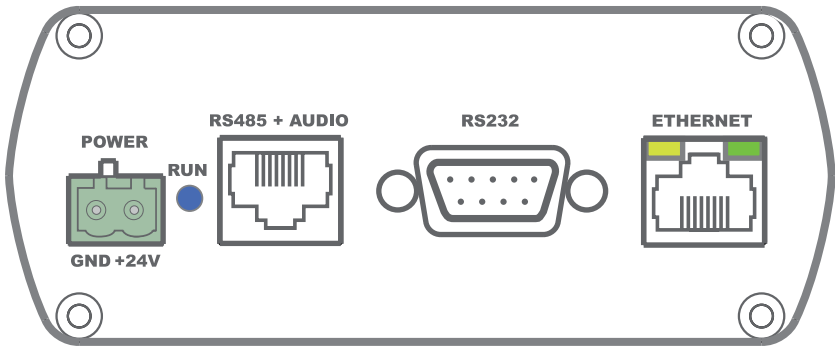
AUDIO B



# Chapter 2

## Overview APC100

### Front panel APC100



*APC100 Front panel*

Various control and configuration ports are located on the front panel of the APC100 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 controlling or configuring peripheral (wall panels, paging microphones, ...) or matrix system should be made on this databus. This databus carries all audio and control signals between the APC100, peripheral interfaces and matrix systems. Connections should be made using twisted pair CAT5E (when using analogue audio transfer) or CAT6 (when using digital audio transfer) cabling.

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

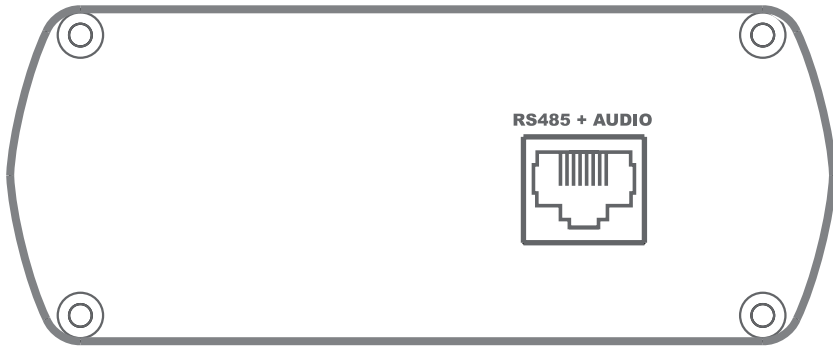
#### 4) RS–232 control port:

The RS–232 control port is implemented using a DB9 connector. Any communication between the APC100 and external control hardware equipped with an RS–232 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 APC100 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 APC100 can be connected in any LAN network.

## Rear panel APC100



*APC100 Rear panel*

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

The rear panel of the APC100 contains only one databus connection. This databus connection has identical possibilities and specifications as the databus connection implemented on the front panel of the APC100. When a connection between the APC100 and a peripheral interface or matrix system is made, the selection between both connections can be freely chosen.

The additional advantage of the second implemented databus makes the APC100 applicable to a connection between a peripheral device (wall panel, paging microphone, ...) and a matrix system. In this typical application one databus connection can be used as input while the second connection can be used as output.

# Chapter 3

## Configuring the APC100

The configuration settings of the APC100 should be made using the web-based user interface. To get access to these configuration settings, the APC100 should be connected to a computer or ethernet LAN network. For more information about network connections and settings, see IP basics in chapter 5.

The standard (factory default) IP address of the APC100 is 192.168.0.194, make sure this address is within the IP range of the connected Ethernet LAN network (subnetmask 255.255.255.0). If the default network 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 made first!

## Configuration interface

Start your default web browser and enter the IP address of the embedded web server of the APC100 in the address bar. (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 APC100. (The factory default password for the APC100 is ‘APC’)

### NOTE

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 APC100*

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

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

## Connection status

At the top left position besides the 'AUDAC' logo is the connection status displayed. To have communication with the device, the connection status must show 'ONLINE'.

# Network Settings

In this window, the network settings of the APC100 can be adjusted. The IP address is default set to 192.168.0.194 and the subnetmask is default set to 255.255.255.0.

The settings can be changed by adjusting the parameters in the shown fields. To confirm the settings, press the OK button. The changed settings will take effect immediately.

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



The screenshot displays the 'AUDAC APC100' interface with a 'Status: ONLINE' indicator. The main section is titled 'NETWORK SETTINGS'. It contains four input fields with their respective values: IP Address (192.168.0.194), Subnet Mask (255.255.255.0), Gateway (192.168.0.253), and DNS-server (8.8.8.8). At the bottom, there are two buttons: 'Cancel' and 'OK'.

*Network settings screen for APC100*

# Password Settings

In this window the password for the APC100 can be changed.



**AUDAC** Status: **ONLINE** **APC100**

**PASSWORD SETTINGS**

Change Admin Password

Old Admin Password

New Admin Password

Retype Admin Password

OK

Cancel

*Password settings screen for APC100*

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 the new password filled in both fields match, the old password will be changed into the new password.

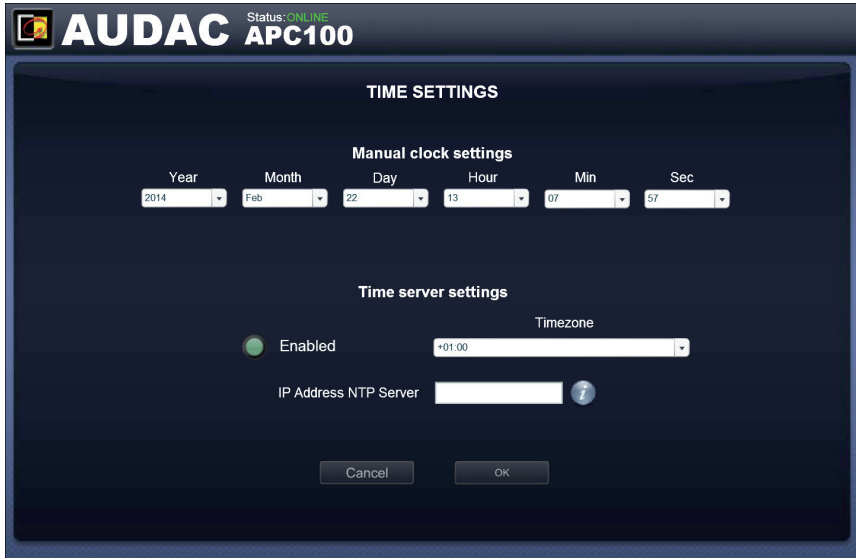


The factory default password is **'APC'**.



# Time Settings

In this window the time settings for the APC100 can be changed.



*Time settings screen for APC100*

The current time and date for the APC100 can be set in this window. The APC100 act as a real-time-clock for synchronizing timer scheduled events on other devices connected in your network. (not including their own real-time-clock)

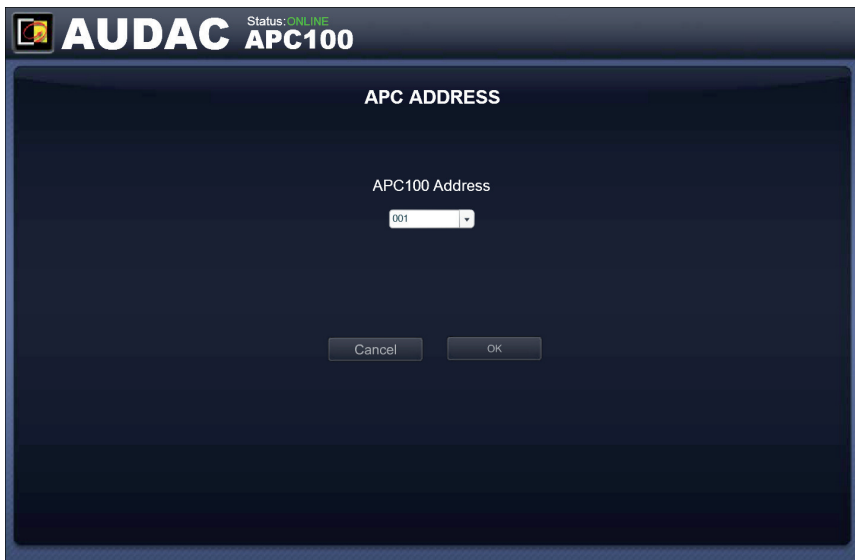
The time and date settings can be entered manually by selecting the right values from the dropdown list. After the correct values are selected, the 'Set Clock' button should be clicked and the entered time & date will be saved. The internal real-time clock which is holding the current time and date has an accuracy of 1 minute / month, meaning the set value may expire with a maximum of 1 minute / month.

A second option is synchronising the internal clock constantly with a public time server. This function can be activated by clicking the 'Enabled' button under the 'Time server settings' header. Subsequently, the time zone in which the device is located should be selected. In case the time server function has been selected, the M2 will try to synchronise 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 APC100 is connected to a LAN network without having access to internet, the APC100 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.

## Address Settings

In this window the address settings for the APC100 can be changed.



*Address settings screen for APC100*

In this window, the address for the APC100 can be selected. The address standard set to '001' and selectable using the dropdown list within a range of '001' and '099'.

When multiple APC100's are used in one configuration or installation, every APC100 should have a unique assigned address. It is recommended to use address '001' for the first connected APC100 and increase by one for every subsequent connected APC100.

# Factory Settings

In the factory settings menu, all settings of the APC100 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 APC100*

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

# Chapter 4

## Using the APC100

The APC100 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.

### Using as a configuration tool

When using the APC100 as a configuration tool, it will establish the link between the matrix, the peripheral devices and the computer (network). For making the actual configuration, the 'AUDAC system manager' software is required. This software is freely available and can be downloaded from the AUDAC website.

This windows compatible software application will detect 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 APC100 is being used as a gateway, it allows connection to and control through any TCP/IP based network for all devices containing an RS-232 or RS-485 interface with APC100 supported baudrate. (19200 baud).

The commands sent to the IP address of the APC100 on port 5001 will be translated and converted to commands on the RS-232 and RS-485.

This way, any device containing RS-232 (Eg: power amplifier) can be connected to your LAN network and controlled through a 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 webpage. 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) RS-232 (DB9)
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)	108 x 44 x 96 mm
Weight	0.73 Kg (Incl power supply)
Packaging	Carton box
Shipping weight & Volume	1.0 Kg – 0.0078 Cbm

# Notes

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