Hardware Documentation

ADP-NT24V4
24V Power Supply

for HW Revision 1.00

Version 004/07.2025
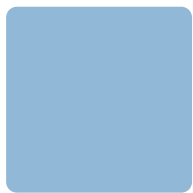
About This Document

This document describes how to use the ADP-NT24V4 (further named as adapter) with mechanical and electrical information. The latest version of this document can be found at: www.fs-net.de.

ESD Requirements

All F&S hardware products are electrostatic discharge (ESD) sensitive. All products are handled and packaged according to ESD guidelines. Please do not handle or store ESD sensitive material in ESD unsafe environments. Negligent handling will harm the product and warranty claims become void.

Review Service

F&S provide a schematic review service for your baseboard implementation. Please send your schematic as searchable PDF to support@fs-net.de.

History

Version/Date	Platform	Added (A) Removed (R) Modified (M)	Chapter	Description	Author
001/02.2025	-	-	All	Initial Version	SM
002/02.2025	-	M	2.3, 2.5, 4.1	Add note, change switch logic, change link	SM
003/06.2025	-	A	1.2.1, 2.3	Add pin 1 marking, add comment	SM
004/07.2025	-	M	1.2.2	Change connector types of J1, typo at J3	SM

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1 Overview

The adapter can supply a suitable F&S module and a display backlight out of one source.

1.1 General Parameter

Parameter	Description
Dimension	72.0 mm x 35.0 mm x 18.4 mm (25-0 mm with Battery Cell)
Weight	≈ 24.0 g
Operating Temperature	-25.0 °C … +85.0 °C
Mounting Holes	4x Ø 3.2 mm

Table 1: General parameter

1.2 Dimensions and Connectors

1.2.1 Technical Drawing
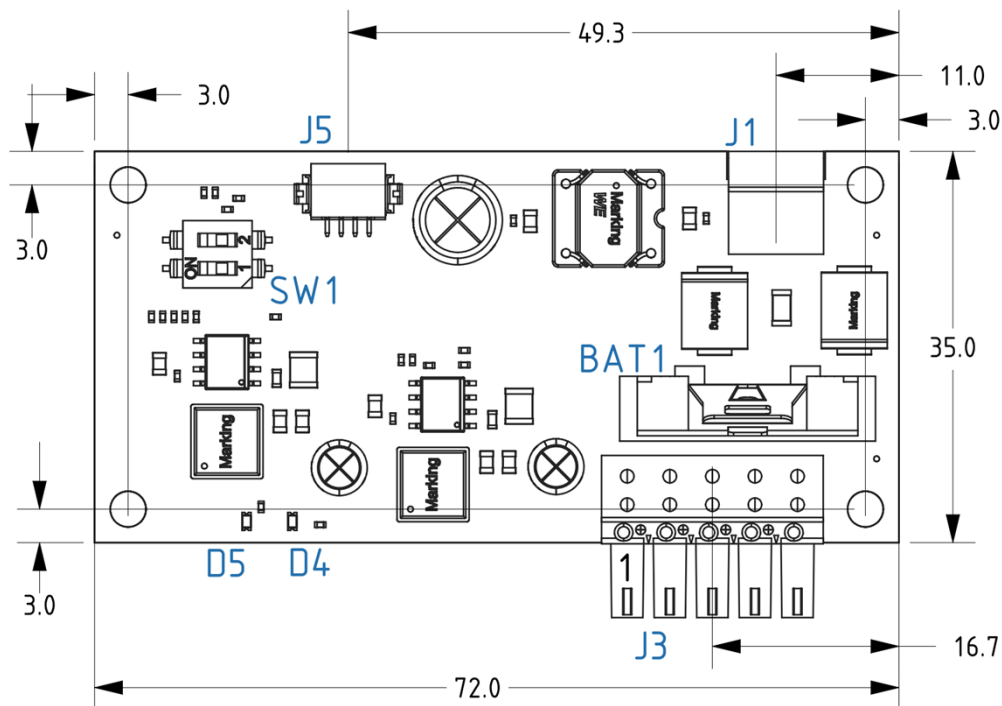
Note: All dimensions are in mm.

Figure 1: Technical drawing

1.2.2 Connectors

Ref.	Description	Connector Type	Counter Part
J1	Power input	Phoenix Contact, MC 1,5/2-G-3,81	Phoenix Contact, MC 1,5/ 2-ST-3,81
J3	Board-to-board connection	Phoenix Contact, IMC 1.5/ 5-G-3.81	Phoenix Contact, MC 1,5/ 5-G-3,81
J5	Backlight disable in	Hirose, DF13-04	Hirose, DF13-4S-1.25C
SW1	Backlight voltage select / Startup delay on/off	DIP Switch 2 pol	
D4	Modul voltage indicator	LED yellow	
D5	Backlight voltage indicator	LED yellow	
BAT1		C2032 battery socket	

[1]Connectors and preassembled cables are available for purchase at www.fs-net.de.

Table 2: Connector description

2 Detailed Description

2.1 Connectivity

For simple integration, the adapter can be connected directly (see Fig. 2). A battery socket for a Real Time Clock (RTC), is provided additionally.
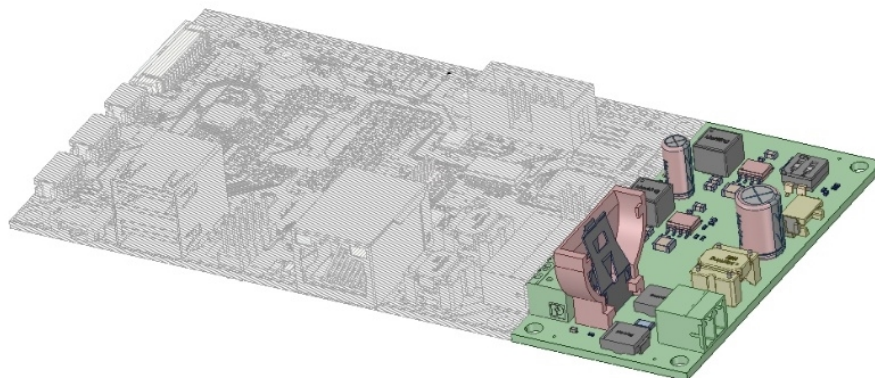

Figure 2: adapter (highlighted) mounted on a armStone™MX8ULP (shaded)

2.2 Power Input

The power input is protected against polarity reversal, overvoltage and overcurrent. If triggerd, replace F1 with a 5A slow type fuse (size 1206).

Pin	Signal Name	Voltage	Description
1	GND		
2	V_{IN}	24 V	Power input

Table 3: Pin description J1

2.3 Power Output

Important Note: Please verify the pinning of the connected module, before connecting module and adapter. If the pinning do not fit, please check the adapter ADP-NT24V3. Because of the pin 1 definition of the connector, the counterpart pin numbers are mirrored.

Pin	Signal Name	Voltage	Description
1	V_{OUT_BL}	5 V / 12 V	Backlight supply voltage
2	GND		
3	V_{OUT_MOD}	5 V	Module supply voltage
4	V_{BAT}	3 V	Real time clock supply
5	GND		

Table 4: Pin description J3

2.4 Real Time Clock (RTC) Supply VBAT

For the RTC supply, a CR2032 battery can be attached into the socket BAT1. The cell is not included in the scope of order. The battery is protected against accidental charging.

2.5   Backlight Supply & Control Bypass

The adapter delivers a supply voltage for a display backlight at connector J3. The backlight voltage can be controlled in different ways.

On J5, BL_ON can be connected to ground to turn the backlight off.

Pin	Signal Name	Voltage	Description
1	n.c.		
2	BL_ON	3.3 V	Turns off backlight voltage, when connected to GND. Internally pulled up.
3	n.c.		
4	GND		

Table 5: Pin description J5

With SW1 the backlight voltage is changeable. Also, it is possible to turn the voltage on after a delay to hide for example the boot screen or start up artefacts.

Pin	Function	State	Description
1	Backlight supply voltage	ON	Backlight voltage = 12 V
		OFF	Backlight voltage = 5 V
2	Backlight on delay	ON	No delay
		OFF	Backlight on delay approx. 7s[1]

[1]The delay also occurs at disabling over the BL_ON signal.

Table 6: SW1 truth table

3   Characteristics

3.1   Absolute Maximum Ratings

Description	Min	Max	Unit
Power Input			
Supply voltage	-0.30	38.00	V
Backlight Enable	-0.30	Supply voltage +0.30 V	V

Table 7: Absolute maximum ratings

3.2   Recommended Operating Conditions

Parameter	Description	Condition	Min	Typ	Max	Unit
General						
V_{IN}	Power supply input voltage		13.00[1]	24.00	36.00	V
P_{IN}	Power consumption	@ max. load	-	-	36.00	W
V_{BAT}	RTC supply voltage		2.20	3.00	3.45	V
V_{OUT_MOD}	Module supply voltage output		4.75	5.00	5.25	V
V_{OUT_BL}	Backlight supply voltage output		4.75	5.00[2]	5.25	V
I_{OUT_J3}	Load current		-	-	3.00[3]	A
I_{OUT_J4}	Load current		-	-	3.00[3]	A
Storage						
T_{STORE}	Storage time	room temperature, no humidity control	6	months		
		t_{amb} = 25°C ± 5°C humidity max. 60%	12[4]	months		

[1] If only 5.00 V output is needed, the min input voltage can be 7.50 V.

[2] Changeable, if needed for other backlight voltages. Please contact F&S Support for further information.

[3] Maximum 3A for continuous load current, 3.60A for short-time peaks.

[4] For longer storage time, vacuum dry packs are recommended.

Table 8: Recommended operating conditions

4   Packaging & Labels

4.1   ESD

All F&S electrostatic discharge sensitive (ESDS) products are marked and will be shipped in ESD protective packaging.

4.2   Serial Number

All shipped F&S products are labeled with a matrix code sticker that includes the serial number. For product information visit www.fs-net.de/en/support/serial-number-info-and-rma/.

5   Appendix

5.1   Second source rules

The qualifications of products from a second source are done autonomously by F&S. This is necessary to guarantee delivery times and product life. A setup of release samples with released second sources is not possible. F&S does not use broker components without the consent of the customer.

5.2   RoHS and REACH statement

Please see the following webpage: https://www.fs-net.de/en/support/certifications/

5.3   Important Notice

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