

## n-PRO-3DP: Using non-SPI LCD

### Background:

Smoothieware/Smoothieboard does not have an option for using character LCD. It can drive only graphical SPI LCDs. This is probably due to lack of GPIO pins (Ethernet functionality is using a lot of GPIO...)

Smoothieboard developer offers an add-on board, that can translate the **SPI** bitstream for

- I2C LCDs
- The more common **PARALLEL LCD**

This board has a complex shape and fits only on Smoothieboard

But

The firmware is open source, called Universal Panel Adapter (UPA), is available in Github and

can be used with Arduino boards or plain ATmega328 microprocessor.

On this mini project <https://github.com/nikoschalikias/firm-universal-panel-adapter> we deploy UPA firmware on a minimal and tidy implementation, to be used with n-PRO-3DP

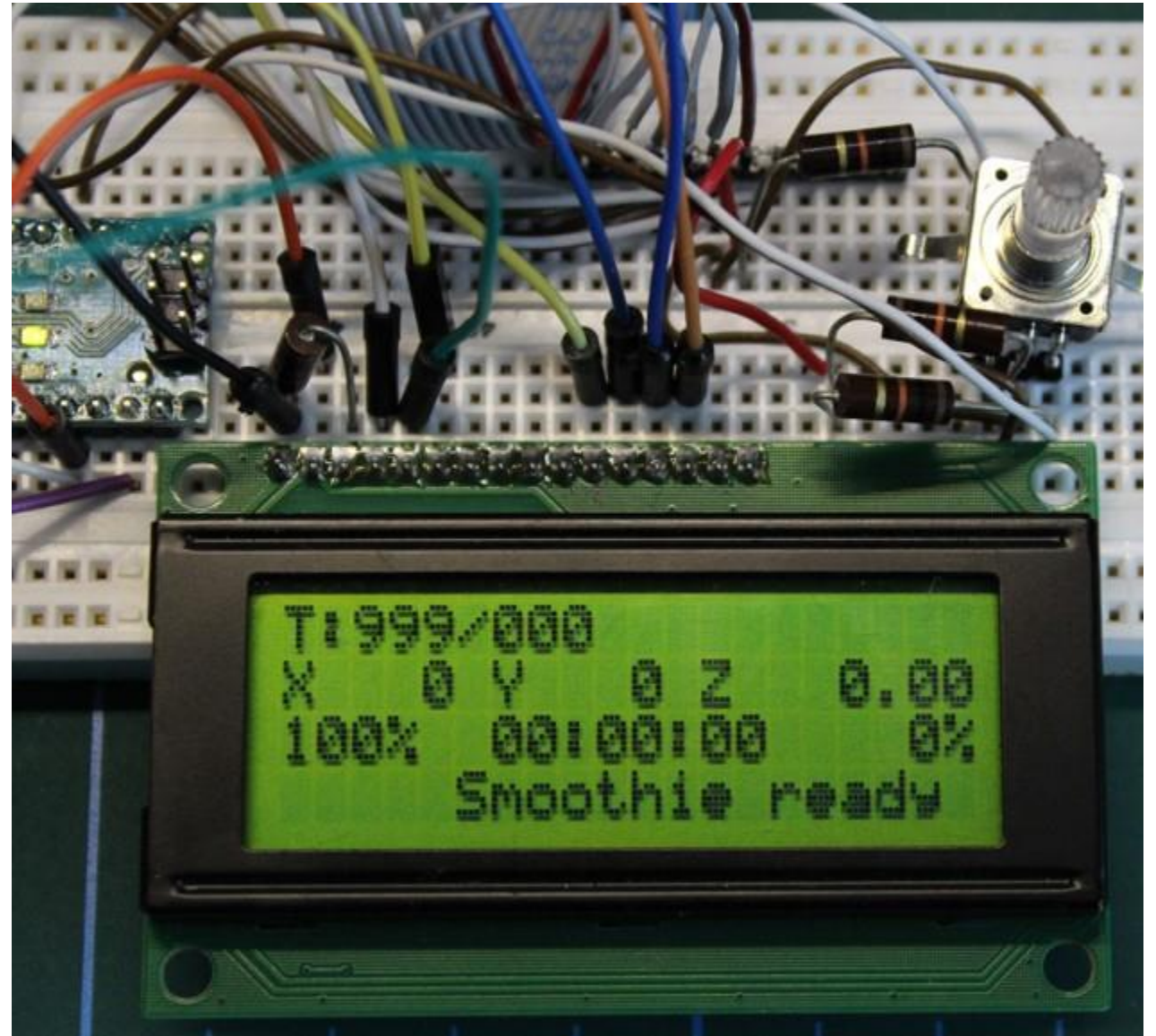
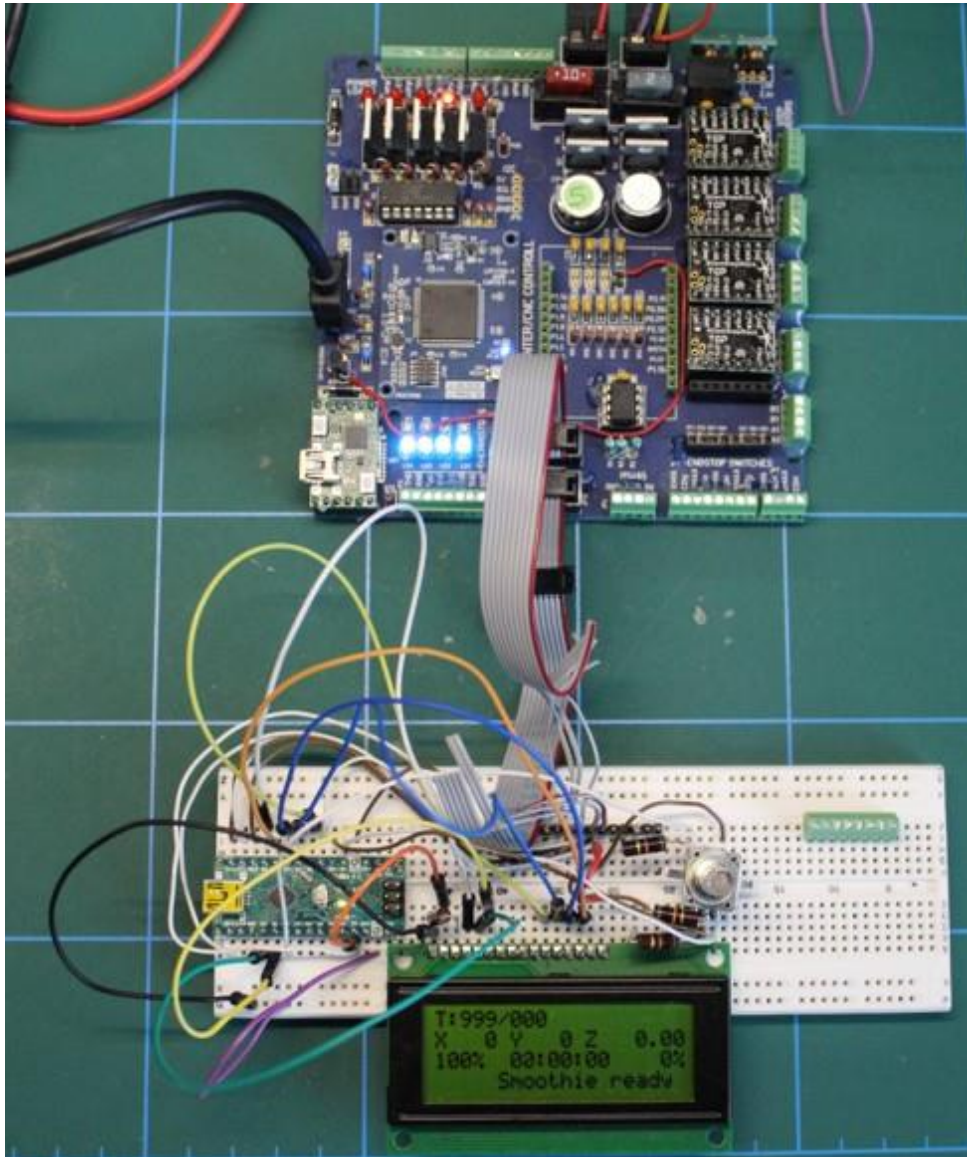
<https://github.com/wolfmanjm/universal-panel-adapter>

<http://smoothieware.org/panel>

[n-blocks.net/nmodules/doku.php?id=nblocks:ni-pro-3dp](http://n-blocks.net/nmodules/doku.php?id=nblocks:ni-pro-3dp)

# n-PRO-3DP: Universal-Panel-Adapter Firmware in Arduino Nano

## Smoothieware can be used with common 4x20 characters LCD



- <https://github.com/nikoschalikias/firm-universal-panel-adapter>
- <https://github.com/wolfmanjm/universal-panel-adapter>
- <http://smoothieware.org/panel>
- <https://stackoverflow.com/questions/42826755/wiring-h-missing-in-arduino/42827754>

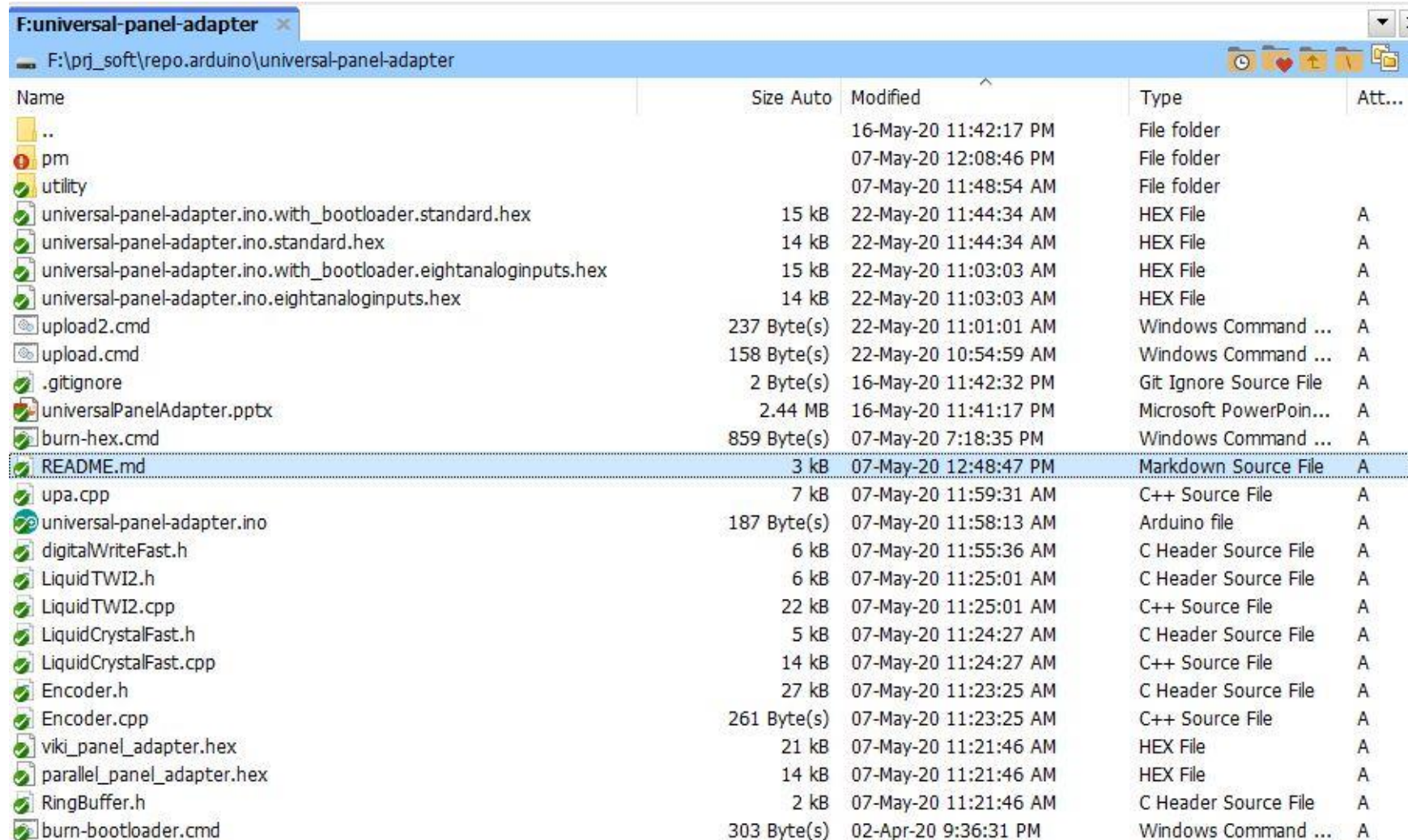
NEXT: Minimal Implementation on 43x33mm  
Perforated board



# n-PRO-3DP: Universal-Panel-Adapter

## Arduino hex

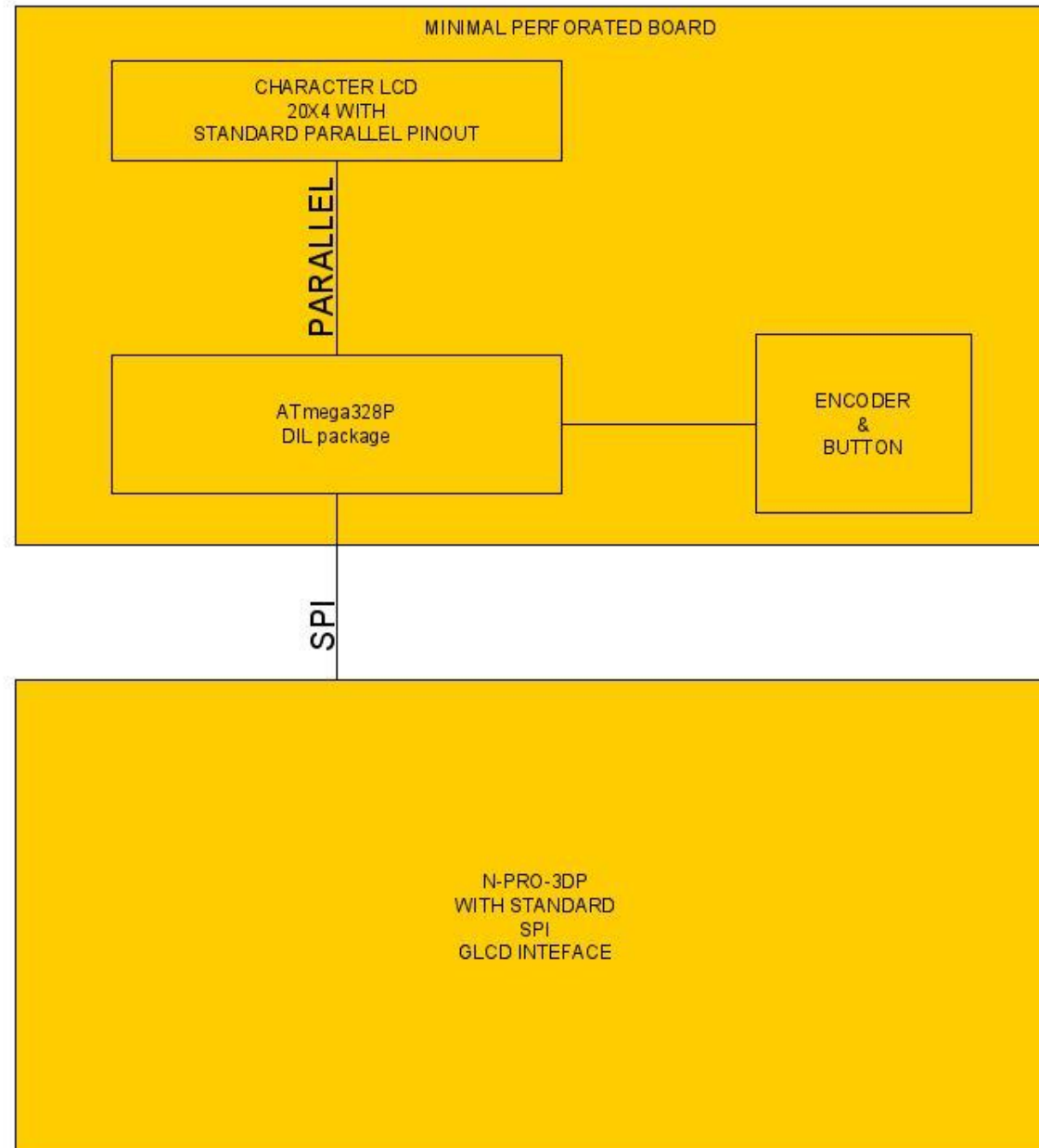
From Arduino IDE : **Sketch: Export compiled Binary**  
This creates 4 hex files as below:



Name	Size Auto	Modified	Type	Att...
..		16-May-20 11:42:17 PM	File folder	
pm		07-May-20 12:08:46 PM	File folder	
utility		07-May-20 11:48:54 AM	File folder	
universal-panel-adapter.ino.with_bootloader.standard.hex	15 kB	22-May-20 11:44:34 AM	HEX File	A
universal-panel-adapter.ino.standard.hex	14 kB	22-May-20 11:44:34 AM	HEX File	A
universal-panel-adapter.ino.with_bootloader.eightanaloginputs.hex	15 kB	22-May-20 11:03:03 AM	HEX File	A
universal-panel-adapter.ino.eightanaloginputs.hex	14 kB	22-May-20 11:03:03 AM	HEX File	A
upload2.cmd	237 Byte(s)	22-May-20 11:01:01 AM	Windows Command ...	A
upload.cmd	158 Byte(s)	22-May-20 10:54:59 AM	Windows Command ...	A
.gitignore	2 Byte(s)	16-May-20 11:42:32 PM	Git Ignore Source File	A
universalPanelAdapter.pptx	2.44 MB	16-May-20 11:41:17 PM	Microsoft PowerPoin...	A
burn-hex.cmd	859 Byte(s)	07-May-20 7:18:35 PM	Windows Command ...	A
README.md	3 kB	07-May-20 12:48:47 PM	Markdown Source File	A
upa.cpp	7 kB	07-May-20 11:59:31 AM	C++ Source File	A
universal-panel-adapter.ino	187 Byte(s)	07-May-20 11:58:13 AM	Arduino file	A
digitalWriteFast.h	6 kB	07-May-20 11:55:36 AM	C Header Source File	A
LiquidTWI2.h	6 kB	07-May-20 11:25:01 AM	C Header Source File	A
LiquidTWI2.cpp	22 kB	07-May-20 11:25:01 AM	C++ Source File	A
LiquidCrystalFast.h	5 kB	07-May-20 11:24:27 AM	C Header Source File	A
LiquidCrystalFast.cpp	14 kB	07-May-20 11:24:27 AM	C++ Source File	A
Encoder.h	27 kB	07-May-20 11:23:25 AM	C Header Source File	A
Encoder.cpp	261 Byte(s)	07-May-20 11:23:25 AM	C++ Source File	A
viki_panel_adapter.hex	21 kB	07-May-20 11:21:46 AM	HEX File	A
parallel_panel_adapter.hex	14 kB	07-May-20 11:21:46 AM	HEX File	A
RingBuffer.h	2 kB	07-May-20 11:21:46 AM	C Header Source File	A
burn-bootloader.cmd	303 Byte(s)	02-Apr-20 9:36:31 PM	Windows Command ...	A

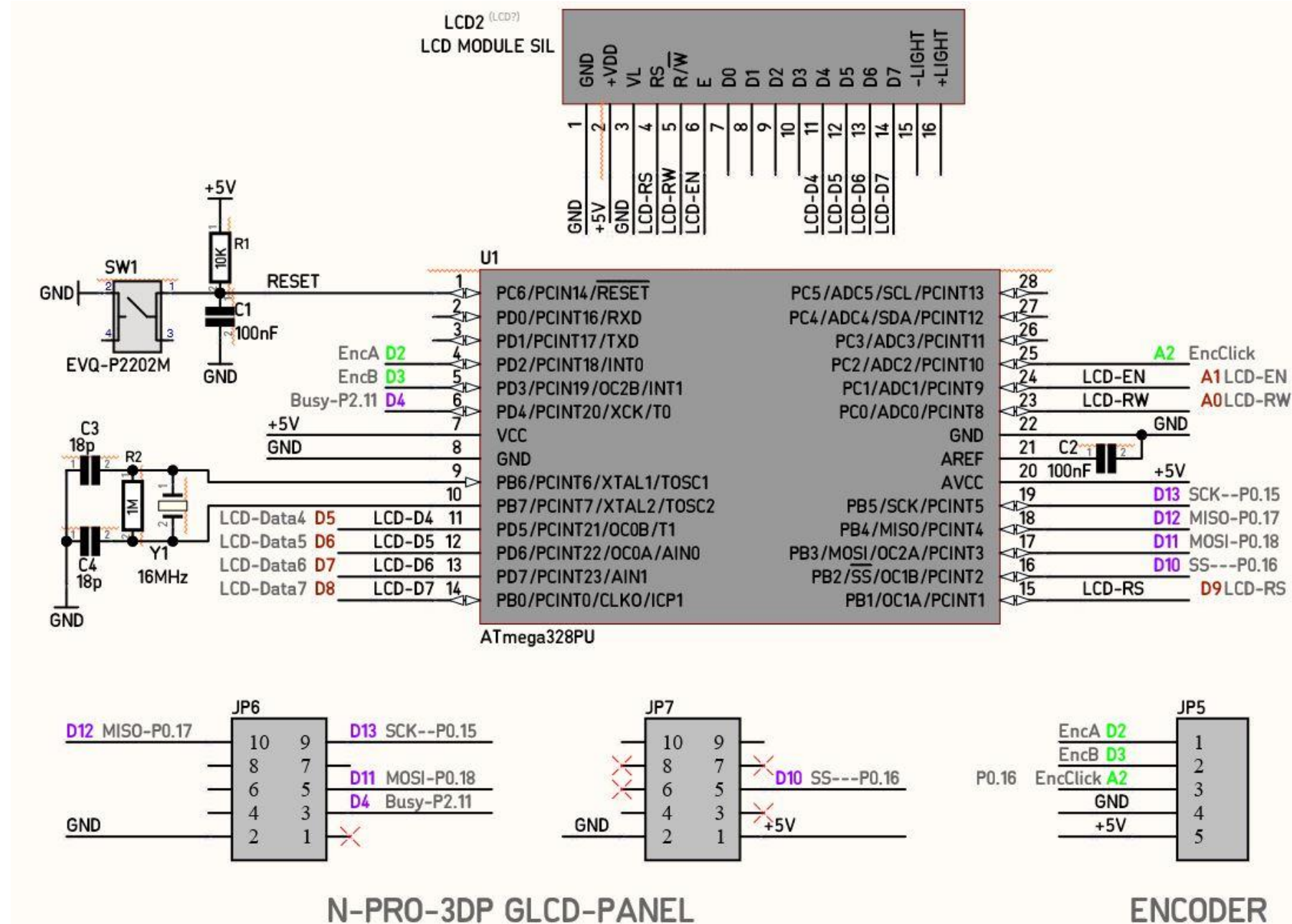
# n-PRO-3DP: Universal-Panel-Adapter

## Minimal Implementation Block Diagram



# n-PRO-3DP: Universal-Panel-Adapter

## Minimal Schematic for Dual In Line ATmega328





# n-PRO-3DP: Universal-Panel-Adapter Minimal Perforated Board

