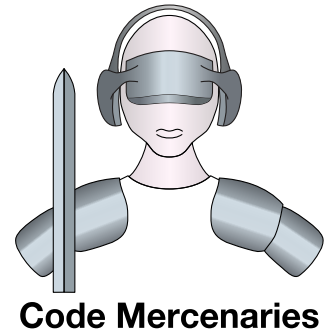


xWarrior28-MOD



Ready to use modules with:
KeyWarrior28, MouseWarrior28, JoyWarrior28,
SpinWarrior28

1. Features

xWarrior28-MOD are ready to use PCB modules with the KeyWarrior28, MouseWarrior28H8L, JoyWarrior28GP32, JoyWarrior28A12L, JoyWarrior28A12-32, JoyWarrior28A12-16, SpinWarrior28A3, SpinWarrior28R4, or SpinWarrior28R6 chips on them.

The modules have a full speed USB interface and all basic components for the operation of the chips. Only the electromechanical components like keys, buttons, and joystick mechanics need to be connected.

2. Variants

2.1 KeyWarrior28-MOD

Based on the KeyWarrior28 this module is a keyboard controller for up to 64 keys in a 8x8 matrix.

- Custom keyboard layout programmable via USB
- Each key can be a modifier plus a typing key
- Mouse function with cursor control via keys
- 32 media control and application keys supported
- Two function shift keys (FN) to switch to a second and third key table
- Up to 19 macros with up to 31 keys each
- Macros can be static, typing, or cell phone like
- Security features prevent overwriting keyboard layout by users
- Unique serial number for definite identification
- 16 bytes of programmable customer data for version tracking and other purposes
- Support for Caps lock, Num lock and Scroll lock LEDs
- FN functions can be activated by the lock LEDs

2.2 MouseWarrior28H8L-MOD

This hybrid joystick and mouse controller uses the MouseWarrior28H8L and offers 4 analog inputs with 8 bit resolution.

- Runtime switching between mouse and joystick
- Compatible with hall sensors etc.
- Up to six buttons connected direct
- Autocalibration and autocentering pin selectable
- Dynamic recentering for drift compensation pin selectable
- 4 auxiliary outputs i.e. to control LEDs, supporting flashing modes

2.3 JoyWarrior28GP32-MOD

Digital joysticks or gamepads are supported by the JoyWarrior28GP32. Directions are controlled by four switch inputs.

- Supports up to 32 buttons, arranged in a 8x4 matrix, or up to 12 buttons connected direct
- Enable output to signal suspend mode to external circuitry
- Mouse emulation mode pin selectable at run time

2.4 JoyWarrior28A12L-MOD

This JoyWarrior28A12L based module offers four analog axes with 12 bit resolution each.

- Supports 8 direct connected buttons or 16 buttons in a 4x4 matrix (pin selectable)
- 4 auxiliary outputs i.e. to control LEDs, supporting flashing modes
- Enable output to signal suspend mode to external circuitry

2.5 JoyWarrior28A12-32-MOD

This JoyWarrior28A12-32 based module offers four analog axes with 12 bit resolution each.

- Supports 12 direct connected buttons or 32 buttons in a 4x8 matrix (pin selectable)
- Enable output to signal suspend mode to external circuitry

xWarrior28-MOD

2.6 JoyWarrior28A12-16-MOD

This JoyWarrior28A12-16 based module offers eight analog axes with 12 bit resolution each.

- Supports 8 direct connected buttons or 16 buttons in a 4x4 matrix (pin selectable)
- Enable output to signal suspend mode to external circuitry

2.7 SpinWarrior28A3-MOD

Module with the incremental encoder controller SpinWarrior28A3.

- 3 encoders plus 6 digital inputs
- 16 bit absolute position tracking
- Index inputs for reset of position
- max. 60 kHz encoder signal frequency for ca. 250,000 steps per second

2.8 SpinWarrior28R4-MOD

Module with the incremental encoder controller SpinWarrior28R4.

- 4 encoders plus 7 switches
- 8 bit relative position tracking
- Up to 25 kHz encoder signal frequency for up to 100,000 steps per second

2.9 SpinWarrior28R6-MOD

Module with the incremental encoder controller SpinWarrior28R6.

- 6 encoders plus 3 switches
- 8 bit relative position tracking
- Up to 25 kHz encoder signal frequency for up to 100,000 steps per second

3. Using the xW28-MOD

To use a xW28-MOD you have to solder connections to the mechanical parts and a USB cable to the module.

A detailed description of the pins and the function of the individual controller can be found in the respective data sheets:

JoyWarrior28A12xx - JoyWarrior28 Datasheet
 JoyWarrior28GP32 - JoyWarrior28 Datasheet
 MouseWarrior28H8L - JoyWarrior28 Datasheet
 KeyWarrior28 - KeyWarrior28 Datasheet
 SpinWarrior28xx - SpinWarrior28 Datasheet

3.1 Pinout

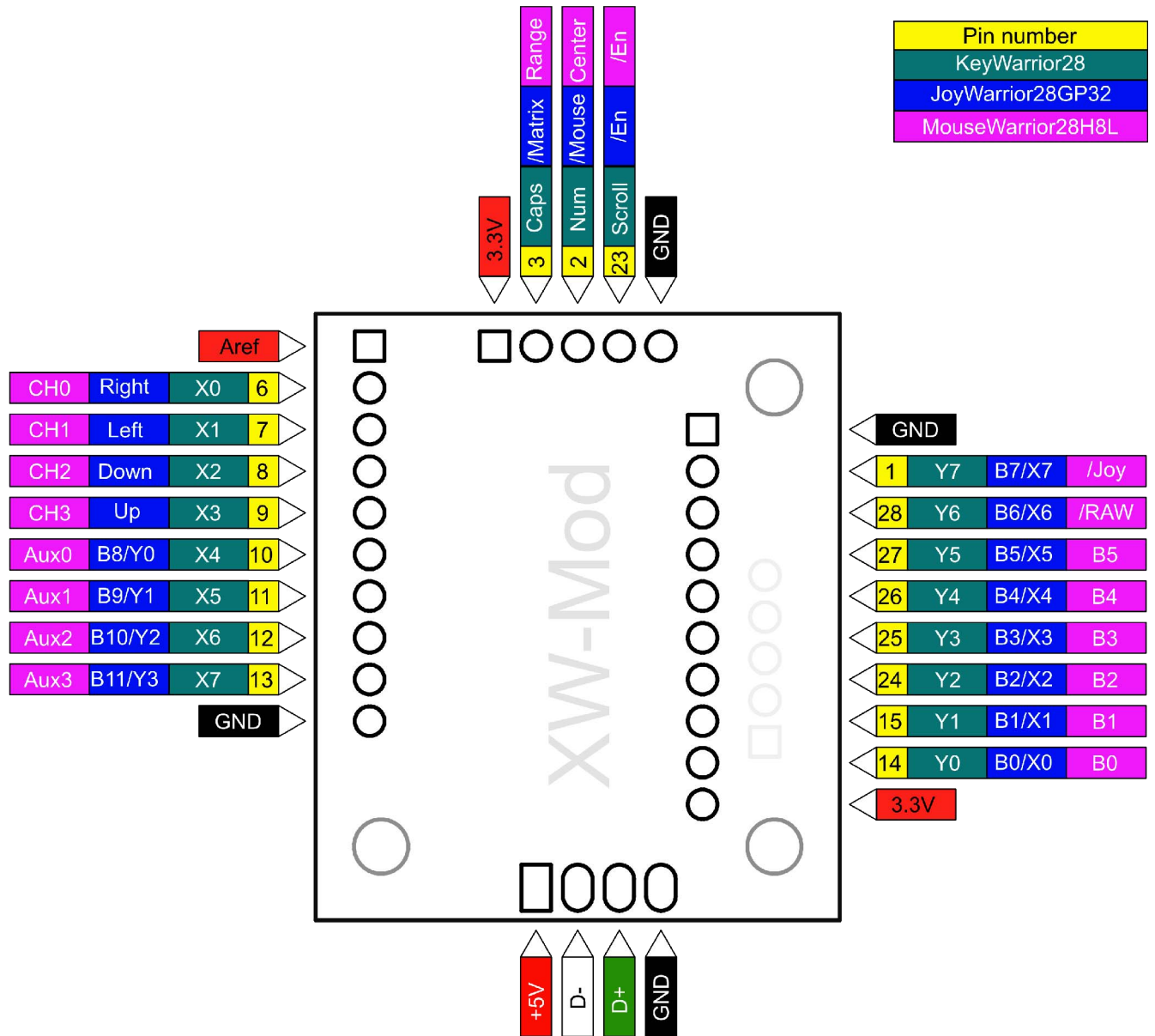
See the diagrams on the following pages for the pin assignment.

The USB connections are labeled with their signal names on the board.

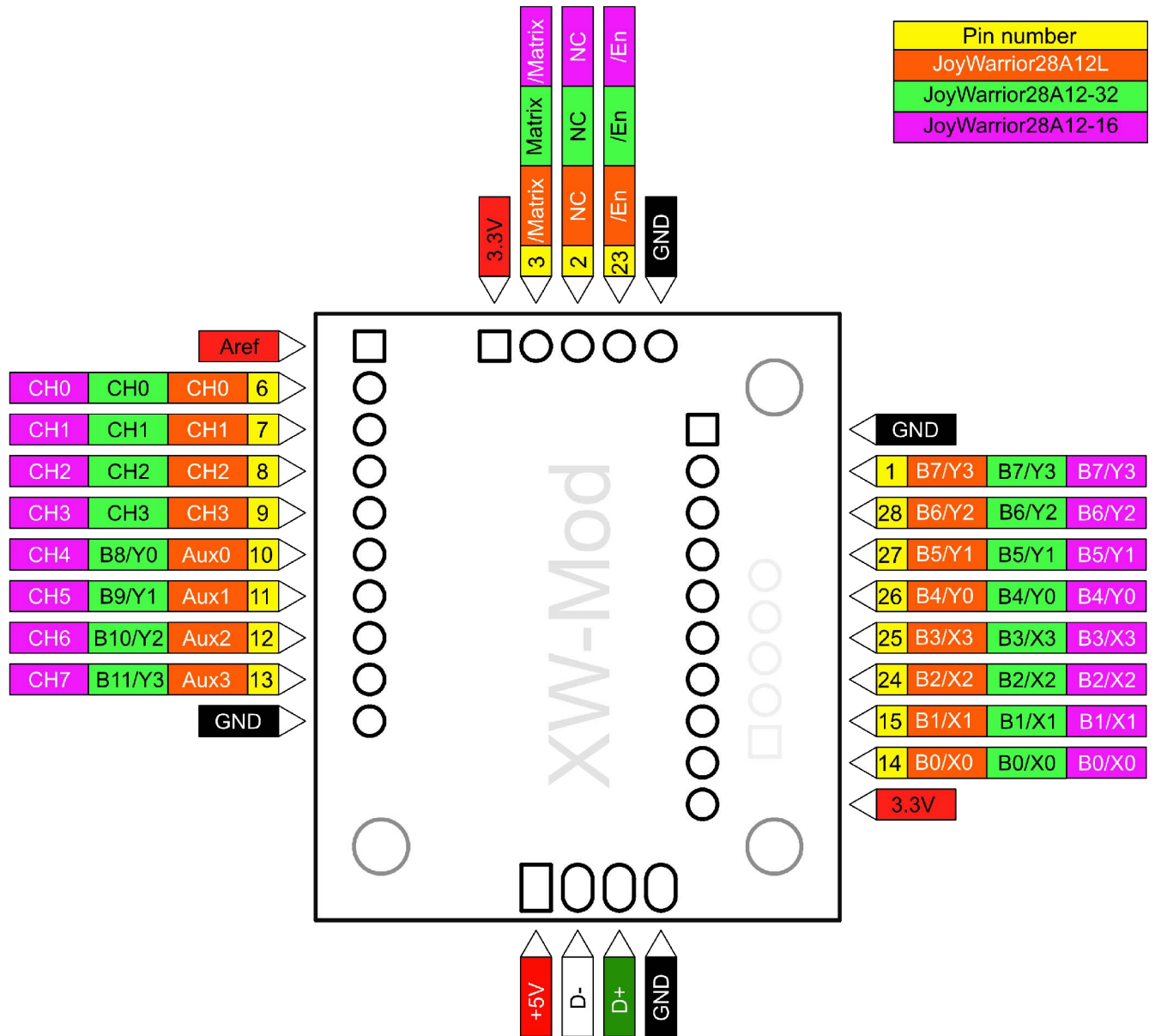
When using a standard compliant USB cable the wire colors are as follows:

Red	+5 V
White	D-
Green	D+
Black	Gnd

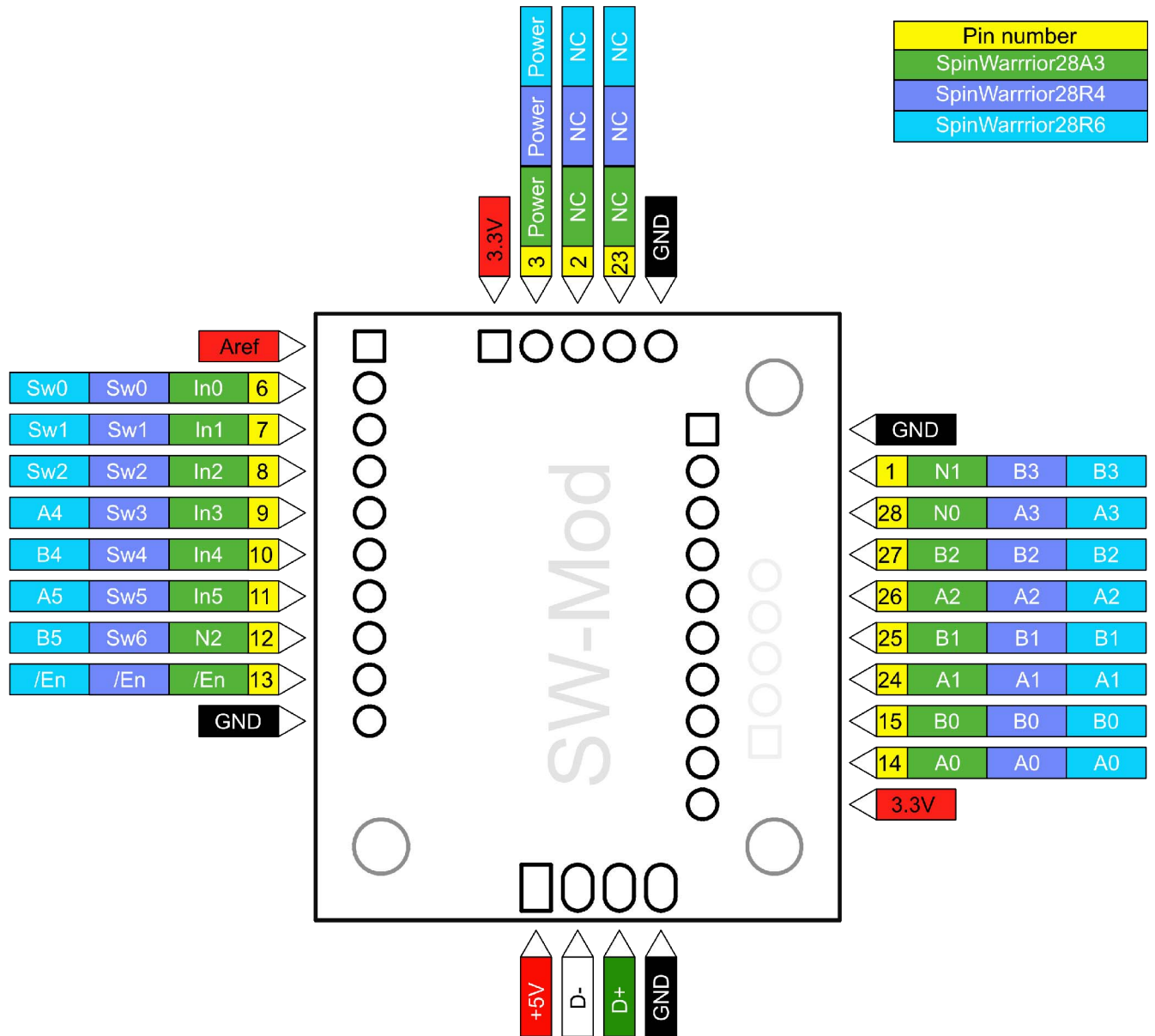
3.2 Pinout for KW28-MOD, JW28GP32-MOD, MW28H8L-MOD



3.3 Pinout for JW28A12L-MOD, JW28A12-32-MOD, JW28A12-16-MOD



3.4 Pinout for SW28A3-MOD, SW28R4-MOD, SW28R6-MOD



4. Troubleshooting

There are very few things that can go wrong with a xW28-MOD.

The most common faults are due to switched wires for the USB cable.

A device showing up that can not be initialized can be a result of D+/D- being swapped.

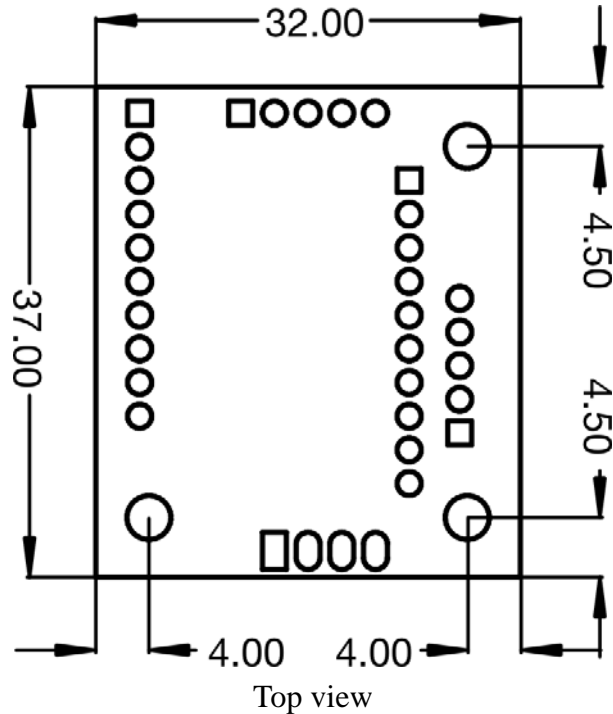
If all connections are correct but the xW28-MOD does not show up on the USB try a different host computer.

4.1 MouseWarrior28H8L-MOD does not start

MouseWarrior28H8L has a self calibration function that can cause a problem when not all axes are used.

Unless all four axes are in a value range of about $\pm 40\%$ of the center position, the controller will not calibrate and not send data. So any unused axis should be tied to a 50% position by using two identical resistors as a voltage divider between Aref and Gnd.

5. Mechanical dimensions



Top view

All dimensions in mm

Mounting holes: 3.2 mm diameter for M3 screws

6. Absolute maximum ratings

Storage Temperature	-65°C to +150°C
Ambient Temperature with power applied.....	-40°C to +85°C
Supply voltage on +5V relative to GND.....	-0.3 V to +6.5 V
DC input voltage into any pin	-0.3 V to +4 V
Maximum current into all ports.....	80 mA
Power Dissipation.....	max. 170 mW
Static discharge voltage.....	>2000 V
Latch-up current.....	>200 mA

These values must not be exceeded, or the device may be damaged.

7. RoHS compatibility

xWarrior28-MOD conforms to the requirements that are necessary to use it in a RoHS compliant device.

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