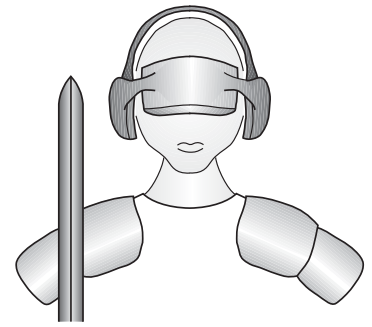


JW24GP32-MOD, KW24D-MOD, KW24-8-MOD, KW24-8M-MOD



Code Mercenaries

USB Joystick and Keyboard Controller Modules

1. Common Features

- USB interface
- Full USB V1.1/2.0 compliance
- Full USB HID 1.1 compliance
- Generic device, supported by system drivers
- Single +5V power supply via USB

1.1 JW24GP32-MOD

- Standard HID class joystick device
- 4 digital direction inputs
- 12 buttons direct or 32 buttons in 4x8 matrix

1.2 KW24D-MOD

- Standard HID class keyboard device
- Direct data input for use with microcontrollers or simple circuits
- Supports all HID keyboard usage codes
- Modifier keys via direct control lines

1.3 KW24-8-MOD

- Standard HID class keyboard device
- Up to 64 keys in 8x8 matrix
- 3 factory programmed key tables
- outputs for caps, scroll, num LEDs

1.4 KW24-8M-MOD

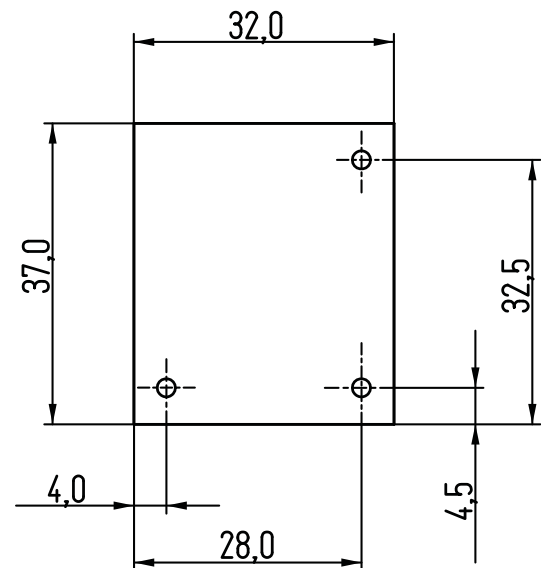
- Standard HID class keyboard and media control device
- Up to 64 keys in 8x8 matrix
- Supports media control keys
- 3 factory programmed key tables
- outputs for caps, scroll, num LEDs

2. Functional overview

The JW24GP32-MOD, KW24D-MOD, KW24-8-MOD, and KW24-8M-MOD are based on the respective JoyWarrior/KeyWarrior chips to offer them in a ready to use form.

The modules are complete USB devices, only a USB cable and the connections to the electromechanical parts need to be added.

2.1. Mechanical dimensions



Solder side view, all dimensions in mm

The mounting holes are 2.5mm in diameter.
The solder pad holes are 0.9mm in diameter.
Tolerances:

Hole diameters: $-0.05 +0.1$ mm

Hole positions: ± 0.05 mm

Outer contour: ± 0.2 mm

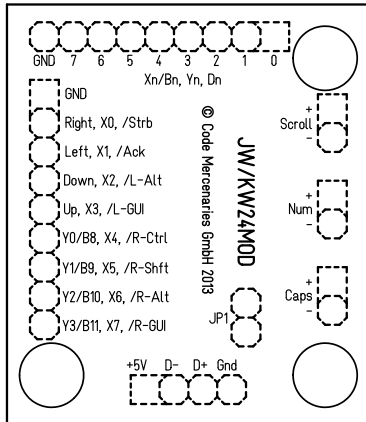
Attention! The mounting hole positions are not identical with the JW24MOD-A8-x modules. They are mirrored, so using the same mounting positions is possible but the module will need to be mounted face down.

2.2 Electrical ratings

Please refer to the JoyWarrior and KeyWarrior24/KeyWarrior24D data sheets for electrical specs.

JW24GP32-MOD, KW24D-MOD, KW24-8-MOD, KW24-8M-MOD

3. Connections



Component side view

D+, D-, +5V, GND

All modules.
Connect to USB cable.

Caps, Num, Scroll

Only on KW24-8-MOD and KW24-8M-MOD.
Connect a LED to each of the outputs to indicate the Caps, Num, Scroll status.
A 390Ω series resistor is on each output, so LEDs may be connected direct. Polarity is indicated by "+" and "-".

Jumper JP1

The jumper has no function on KW24-8-MOD and KW24-8M-MOD.
On JW24GP32-MOD close this jumper to select direct button input. If the jumper is open matrix mode will be used for buttons.
On KW24D-MOD close the jumper to activate modifier hold mode.

Connections	JW24GP32-MOD	KW24D-MOD	KW24-8-MOD	KW24-8M-MOD
Xn/Bn, Yn, Dn	X0..7 matrix or B0..7 direct button inputs	D0..7 key code data input	Y0..7 key matrix output	Y0..7 key matrix output
Right, X0, /Strb	Right direction switch input	/Strb handshake input	X0 key matrix input	X0 key matrix input
Left, X1, /Ack	Left direction switch input	/Ack handshake output	X1 key matrix input	X1 key matrix input
Down, X2, /L-Alt	Down direction switch input	L-Alt modifier input	X2 key matrix input	X2 key matrix input
Up, X3, /L-GUI	Up direction switch input	L-GUI modifier input	X3 key matrix input	X3 key matrix input
Y0/B8, X4, /R-Ctrl	Y0 matrix output or B8 direct button input	R-Ctrl modifier input	X4 key matrix input	X4 key matrix input
Y1/B9, X5, /R-Shft	Y1 matrix output or B9 direct button input	R-Shft modifier input	X5 key matrix input	X5 key matrix input
Y2/B10, X6, /R-Alt	Y2 matrix output or B10 direct button input	R-Alt modifier input	X6 key matrix input	X6 key matrix input
Y3/B11, X7, /R-GUI	Y3 matrix output or B11 direct button input	R-GUI modifier input	X7 key matrix input	X7 key matrix input

JW24GP32-MOD, KW24D-MOD, KW24-8-MOD, KW24-8M-MOD

4. Absolute Maximum Ratings

Storage Temperature	-65°C to +150°C
Ambient Temperature with power applied.....	-0°C to +70°C
Supply voltage on Vcc relative to Gnd	-0.5V to +7V
DC input voltage.....	-0.5V to Vcc+0.5V
Maximum current into all ports.....	70mA
Power Dissipation.....	300mW
Static discharge voltage.....	>2000V
Latch-up current.....	>200mA

Absolute ratings must not be exceeded, or damage to the modules may be caused.

4.1 DC Characteristics

	Parameter	Min	Max	Units	Remarks
V _{cc}	Operating Voltage	4.35	5.25	V	
I _{cc}	Operating Supply Current (no loading)		20	mA	
I _{sb}	Suspend mode current		25	μA	Oscillator off
I _{ol}	Sink current on output pins		2	mA	V _{out} = 0.4V
R _{up}	Pull-up Resistance on output and input pins	8	24	kΩ	internal pull ups on all pins
I _{led}	Sink current into LED pins (KW24-8x)		15	mA	Internal 390Ω series resistor
I _{snk}	Combined sink current into all pins		70	mA	Cummulative across all ports
V _{ith}	Input Threshold Voltage	40%	60%	V _{cc}	
	USB Interface				
V _{oh}	Static output high	2.7	3.6	V	15kΩ±5% to GND
V _{ol}	Static output low		0.3	V	
V _{di}	Differential Input sensitivity	0.2		V	(D+)-(D-)
V _{cm}	Differential Input common Mode Range	0.8	2.5	V	
V _{se}	Single Ended Transceiver Threshold	0.8	2.0	V	
C _{in}	Transceiver capacitance		20	pF	
I _{io}	Hi-Z State Data Line Leakage	-10	10	μA	0V < V _{in} < 3.3V, Hi-Z State
R _{pu}	Bus Pull-up resistance	1.274	1.326	kΩ	1.3kΩ±2% to V _{cc} *
R _{pd}	Bus Pull-down resistance	14.25	15.75	kΩ	15kΩ±5%

5. Ordering information

Partname	Order Code	Description
JoyWarrior24GP32-MOD	JW24GP32-MOD	Joystick controller for four direction switches and 12 or 32 buttons
KeyWarrior24D-MOD	KW24D-MOD	Keyboard controller for input from external devices, parallel key code input
KeyWarrior24-8-MOD	KW24-8-MOD	Keyboard controller for up to 64 keys in 8x8 matrix, fixed layout
KeyWarrior24-8M-MOD	KW24-8M-MOD	Keyboard controller for up to 64 keys in 8x8 matrix, including media controls

The modules listed here are standard products. Customized modules are available on request.

5.1 Packaging info

Modules are sold in single units for the standard models, packaging is antistatic wrap.

The modules are produced in larger boards consisting of 56 modules each. For custom versions it is only possible to produce in multiples of 56, though the actual shipping quantity may vary from this as faulty modules may be rejected in production testing. Please contact sales for questions regarding customizing a module.

5.2 USB VendorID and ProductID

By default all JoyWarrior modules are shipped with the USB VendorID of Code Mercenaries (\$7C0 or decimal 1984) and a fixed ProductID.

On request modules can be equipped with the customers VendorID and ProductID. VendorIDs can be obtained from the USB Implementers Forum <www.usb.org>

Customized modules are subject to minimum order quantities, contact <sales@codemerccs.com> for details.

Following are the ProductIDs:

JW24GP32-MOD	\$1101
KW24D-MOD	\$0223
KW24-8-MOD	\$0220
KW24-8M-MOD	\$0221

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Code Mercenaries
Hard- und Software GmbH
Karl-Marx-Str. 147a
12529 Schönefeld
Germany
Tel: +49-3379-20509-20
Fax: +49-3379-20509-30
Mail: support@codemerccs.com
Web: www.codemerccs.com

HRB 9868 CB
Geschäftsführer: Guido Körber, Christian Lucht