bORG v1.2 – Quick Reference (alpha)

Project: Korg Modwave MKI → Arduino Pro Micro (3.3 V) • 2× PCF8574 (CJMCU■2317) • Joystick • Octave shift LEDs

Hardware Summary

• Expander #1 (I²C 0x20) – INPUTS: P0 Sustain (CC64), P1 Extra (CC67), P2 Oct UP, P3 Oct DOWN, P4–P7 reserve.

• Expander #2 (I²C 0x21) – OUTPUTS: P0–P2 DOWN RGB (R,G,B), P3–P5 UP RGB (R,G,B), P6–P7 reserve.

• LEDs: common cathode to GND; each anode via 220–330 Ω; ~1–2 mA/channel is fine at 3.3 V.

• Joystick: A0=Pitchbend, A1=Mod Wheel (10 kΩ pots), optional SW to expander input.

• FN button: Arduino D15 (INPUT_PULLUP) – reserved for future hostless config.

Octave Shift & LED Colors

• Shift range: –3..+3 octaves relative to NOTE_BASE (default 48/C3).

• Only one LED is lit at a time: DOWN LED for negative shifts, UP LED for positive shifts.

• Color map: ±1 → GREEN; ±2 → YELLOW (R+G); ±3 → RED; 0 → both OFF.

SysEx Command Reference

All SysEx messages use manufacturer ID 0x7D (non■commercial). Format: F0 7D <cmd> [data...] F7

Version	Cmd / Data	Description	Example
v1.0	01 cc (cc=0..7)	Select velocity curve	F0 7D 01 03 F7 → PIANO
	02	Calibration start (unlock)	F0 7D 02 F7
	03	Calibration lock (stop)	F0 7D 03 F7
	04	Save calibration + settings to EEPROM	F0 7D 04 F7
	05	Factory reset	F0 7D 05 F7
	06 vv (1..127)	Set fixed velocity (ORGAN_FIXED)	F0 7D 06 64 F7 → 100
	0A	Print STATUS to Serial Monitor	F0 7D 0A F7
v1.1	07 cc (1..16)	Set MIDI channel	F0 7D 07 0A F7 → ch.10
	08 pp (0..127)	Send Program Change	F0 7D 08 14 F7 → PC#20
v1.2	—	Octave shift via buttons (no SysEx yet). Future: config ~~du~~mp/load (TBD).	

Testing Checklist

■ I²C OK (0x20 inputs, 0x21 outputs).

■ Sustain CC64 toggles 0/127; Extra CC67 toggles 0/127.

■ Octave LEDs match shift (–3..+3).

■ Pitchbend centered (dead■zone correct).

■ Mod Wheel (CC1) responds 0..127.

Notes & License

• Keep I²C wires short and twisted (SDA/SCL). If your expanders lack pull■ups, add 4.7 kΩ to 3.3 V.

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