

Readiness report — Introduction to Microcontrollers (Lake Washington Tech OER)

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Readiness: Introduction to Microcontrollers (Lake Washington Tech OER)

Verdict: Ready with caveats · 2026-09-02 · est. parts cost \$70-\$130 **Cybersecurity — software & network: Could not check**

Every part this lab needs is currently Active and in stock, most of it at authorized distributors, and the microcontroller problem that drove the previous report's caveats has gone away: that report priced the extended-temperature PIC16F18875-E/P, which is still at zero DigiKey stock, while the part this lab's bill of materials actually specifies — PIC16F18875-I/P — is held in quantity by five distributors at \$2.27. The verdict stays "Ready with caveats" rather than moving to "Ready" for one reason: the Lab 9 glass-break detector cannot be sourced as described (a 5 V module with a logic output). Everything found under that description is a 12 V alarm-panel or smart-home product from \$19.95 up, none of which the evidence shows to run at 5 V or expose a digital output pin. The lab's own materials allow simulating that sensor with a pushbutton already on the parts list, and the sensor is optional, so this is a caveat rather than a blocker.

Action required

Part	Problem	Recommended action
Acoustic / vibration glass-break detector	No 5 V module with a logic output found; all listings are 12 V alarm-panel or smart-home units, \$19.95-\$59.99, none verified compatible. Carried over from the previous report, still unresolved.	Simulate the sensor with one of the 6 mm tactile pushbuttons already on the BOM, as the lab materials permit. The sensor is optional — Lab 9's five-opening requirement can be met with reed switches and the PIR module.
5 V active piezo buzzer	Several listings in the same search are passive (externally driven) transducers, which will not work with the lab's code. New note this check.	Order only a listing that states "active" or "self-driving"; the \$1.20 module below is labelled active.

Cybersecurity — software & network

Could not check — All three components are Microchip vendor tools with no version stated anywhere in the lab materials and no advisory or support-status source covering them, so no check could run this session; the one thing that can be said comes from the materials

themselves, namely that an unpinned MPLAB X install may no longer carry the MPASM toolchain the labs require.

Component	Version	How known	Support status
Microchip MPLAB X IDE	not determined	unpinned (the lab manual tells students to install the latest version; no release is named anywhere in the materials (snapshot))	—
Microchip MPASM / pic-as assembler toolchain	not determined	unpinned (bundled with whichever MPLAB X release is installed; the materials name the toolchain (project language toolchain set to MPASM) but no version (snapshot))	—
Microchip PICkit-On-Board (PKOB) programmer firmware	not determined	not determined (on-board firmware of the DM164136; version not stated in the materials and updated by the IDE over USB (snapshot))	—

Component	Finding	Severity	Fix available?
Microchip MPASM / pic-as assembler toolchain	The lab's projects are configured for the legacy MPASM assembler while the materials tell students to install whatever MPLAB X release is current, so the toolchain the .asm source files are written for may not be present in the version an instructor installs today.	posture	Mitigation only — before the term, install MPLAB X and confirm the MPASM toolchain can still be selected in project properties; if it cannot, the lab's .asm sources have to be assembled with pic-as/XC8 instead, which needs syntax changes.

What this means for your lab

Nothing in this lab's software talks to the network. MPLAB X and its assembler run on the student's or instructor's own computer, and the only link to the hardware is the USB cable to the Curiosity board, so no one else on the campus network can reach anything the lab sets up. That also means nothing was actually checked for known vulnerabilities: Microchip's IDE, its assembler, and the board's on-board programmer firmware are not listed in the public vulnerability databases used here, and the materials never name a version. That is a gap in what is known, not a clean bill of health. The practical risk here is availability rather than security: the manual says to install the newest MPLAB X, and the labs are written for the older MPASM assembler. Download the tools only from Microchip's own site, and before the term starts, install MPLAB X on one machine and check that the lab's .asm files still assemble with the MPASM toolchain the project settings call for.

Not checked

- Microchip MPLAB X IDE: no version is stated in the materials (they say to install the latest release), and MPLAB X is not covered by the vulnerability or end-of-life databases this check uses

- Microchip MPASM / pic-as assembler toolchain: vendor toolchain bundled with the IDE; no version stated in the materials and no advisory database covers it
- Microchip PICkit-On-Board (PKOB) programmer firmware: proprietary on-board programmer firmware; version not stated and managed automatically by the IDE, with no public advisory database

Parts

Microcontroller and Development Hardware

Part	Spec/Package	Status	Stock	Price	Source	Drift
DM164136	Curiosity HPC development board	Active	99 (DigiKey), 206 (Spirit), 46 (Newark)	\$33.99	DigiKey	Price unchanged; DigiKey stock 201 → 99
PIC16F18875-I/P	8-bit MCU, 40-DIP (0.600 inch, 15.24 mm), 2.3 V–5.5 V	Active	620 (DigiKey), 1,134 (Mouser)	\$2.27	DigiKey	New baseline — the previous report priced the -E/P variant instead
USB 2.0 cable, Type-A to Micro-B	Standard 1 m data/power cable	Active	Retail	\$2.37	Grainger (Monoprice)	—

Note on the MCU: this run also re-checked **PIC16F18875-E/P**, the part the previous report listed. It is Active at [\\$2.40](#) but still shows no DigiKey stock; other authorized distributors hold it (Spirit Electronics 4,130; Mouser 549 at \$2.46 — the same price and quantity as in July). The -I/P part the bill of materials specifies is the easier buy and is what the table above prices.

Prototyping and Passive Support Hardware

Part	Spec/Package	Status	Stock	Price	Source	Drift
Solderless breadboard	830 tie-point, 2.54 mm grid	Active	Retail	\$4.99	Micro Center (Inland)	Previous report priced a \$9.99 breadboard + jumper kit; not like-for-like
Jumper wire kit (M-M, M-F)	22–24 AWG, 0.1 inch headers	Active	Retail	\$4.99	Love My Switches (140 pcs)	Same as above; sets with a stated M-F count run to \$12.99
CF14JT330R	330 Ω, 1/4 W, axial through-hole	Active	216,274	\$0.10	DigiKey	Previous report priced a \$9.95 resistor kit; no per-part baseline
CFR-25JB-52-10K	10 kΩ, 1/4 W, axial through-hole	Active	173,171	\$0.10	DigiKey	As above

Discrete Indicators and Sensors

Part	Spec/Package	Status	Stock	Price	Source	Drift
WP7113ID	5 mm red LED, T-1 3/4 through-hole	Active	145,555	\$0.21	DigiKey	—
WP7113GD	5 mm green LED, T-1 3/4 through-hole	Active	91,778	\$0.23	DigiKey	—
WP7113QBC/D	5 mm blue LED, T-1 3/4 through-hole	Active	3,162	\$0.44	DigiKey	—
Assorted 5 mm LEDs	5 mm through-hole, mixed colours	Active	Retail	\$2.70	Parts Express (105 pcs)	Cheaper listings than the previous \$8.49 pack — different products, not a price cut
MCP9701-E/TO	Linear active thermistor, TO-92-3, 3.1 V-5.5 V	Active	6,413	\$0.53	DigiKey	Price unchanged; stock 3,526 → 6,413

Security System Peripherals (Lab #9)

Part	Spec/Package	Status	Stock	Price	Source	Drift
Magnetic reed door/window sensor	Surface-mount contact pair, wired	Active	Retail	\$1.51	DigiKey (Tane)	Cheaper than the previous \$4.75 listing
PIR motion detector (HC-SR501)	3-pin module, 5 V	Active	Retail	\$3.95	PiShop USA	Unchanged at \$3.95
Glass-break detector	5 V module with logic output	Hard to obtain as specified	—	—	—	Still unresolved since the previous report; see Substitutes
Numeric keypad matrix	3x4 membrane, 7-pin header	Active	Retail	\$2.95	PiShop USA (Adafruit)	Unchanged at \$2.95
Character LCD 16x2	HD44780 parallel or I2C backpack, 5 V	Active	Retail	\$4.95	PiShop USA	Previous report priced \$11.90; comparable modules now list near \$5
5 V active piezo buzzer	Through-hole or module, 3.5 V-5.5 V	Active	Retail	\$1.20	aretronics.com	Previous report priced \$0.99; see Action required about active vs. passive

Part	Spec/Package	Status	Stock	Price	Source	Drift
5 V relay module, 1-channel	3-pin input header, screw terminals, optocoupler per listing	Active	Retail	\$5.59	Kleen-Rite (HiLetgo)	Previous report priced \$6.37; listings from \$0.84 exist
SPST momentary pushbutton	6x6 mm tactile, 4-pin through-hole	Active	Retail	\$2.50	DigiKey (Adafruit, 20 pack)	Unchanged at \$2.50

An authorized-distributor alternative for the buzzer: PUI Audio [AI-2429-TWT-5V-R](#), Active, \$3.16, stock 1,937 at DigiKey. Whether it is self-driving (active) rather than externally driven is not stated in the evidence gathered here — confirm on the product page before ordering.

Substitutes

For part	Substitute	Differences	Verified	Judgment
Glass-break detector	6 mm tactile pushbutton, 20 pack (\$2.50, DigiKey)	A manual contact closure instead of an acoustic sensor: students trigger the "glass break" zone by pressing the button. Same 5 V logic input to the PIC, no sensor power and no sensitivity tuning; it loses the acoustic detection a commercial unit would provide.	Simulation route authorised by the lab's own substitution latitude; price and availability from this run's shopping evidence. Not verified: no commercial 5 V glass-break module was found or its product page fetched, so nothing is claimed about the alarm-panel units in the search results.	Acceptable for the lab exercise — Lab 9 grades the alarm logic, not the sensor's physics.

Instructors must verify any substitute against its datasheet before ordering.

Other dependencies

- **PCB fabrication:** none required. All student circuits are breadboard-based on the commercial Curiosity HPC board; no Gerber or CAD files exist in the materials.
- **OpenWA Pressbooks lecture videos** (17 embedded links, e.g. <https://openwa.pressbooks.pub/nehakardam10/?p=5>): **not checked** this run — the fetch was blocked or timed out, which does not distinguish a dead page from a bot block. The previous report recorded these as active on 2026-07-19. Open one link manually before the term.
- **Microchip product and datasheet portals** (DM164136 page, PIC16F18875 product page and datasheet PDF, 8-bit mid-range reference manual): **not checked** — the fetch of the DM164136 product page was likewise blocked. Indirect signal only: DigiKey lists both the board and the MCU as Active with stock.

- **YouTube lecture links** (3 in the bibliography): **not checked** — no lookup was dispatched for them.

Watch list

- **DM164136 board:** DigiKey stock halved since July (201 → 99) at an unchanged \$33.99. Five other authorized distributors still hold stock, but this is the lab's single-source, non-substitutable item — worth watching every check.
- **PIC16F18875-E/P:** if a future revision of these materials calls for the extended-temperature part, note that it remains at zero DigiKey stock, carried only by Mouser and Spirit Electronics.
- **Glass-break detector:** the specified 5 V module has now failed to surface in two consecutive checks. If the lab is to keep a real sensor, the materials need a specific part number.
- **Retail-sourced peripherals** (LCD, relay, buzzer, keypad, jumper kits): priced from single marketplace listings that change week to week. Treat the ranges rather than individual figures as the baseline.
- **5 mm blue LED (WP7113QBC/D):** stock 3,162 is an order of magnitude below the red and green parts; any 5 mm blue LED substitutes, so this is a convenience risk only.