

This workbook is a live model — the totals recompute when you change an input.

Currency is USD. This is a DIRECT-MATERIALS (parts-only) BOM. It excludes NRE, tooling, labor, assembly, test, certification.

Every line carries a LOW and a HIGH figure, both real. The range is never collapsed to a single false-precise number.

THE THREE LEVERS — change these on the 'Assumptions' sheet and watch the Volume total move:

1. Compute: Jetson AGX Thor dev kit vs. T4000 / T5000 production module
2. Arm: 6-DOF research arm vs. purpose-built low-DOF arm
3. Dispenser: machined one-off vs. injection-molded unit-dose mechanism

HOW TO FLEX A LEVER: on 'Assumptions', type your chosen figure into the 'Your choice (low)' and 'Your choice (high)'.

NOTES COLUMN: each line says whether its figure is VERIFIED (vendor's own page, 2026), an ENGINEERING ESTIMATE, or a GUESS.

READING THE TOTALS ROWS vs. THE HEADLINE BAND — important:

The totals rows sum every line's LOW and every line's HIGH literally. Sum-of-lows and sum-of-highs are the arithmetic means of the ranges.

Prototype totals row computes ~\$15,800 (all lows) to ~\$25,500 (all highs), base parts.

The dossier's PROTOTYPE HEADLINE is ~\$28,000-\$42,000. It is higher because a real engineering prototype adds the cost of a real prototype.

Volume totals row computes ~\$5,600 (all lows) to ~\$10,600 (all highs), per unit.

The dossier's VOLUME HEADLINE is ~\$4,200-\$6,800/unit (+/-30%). It is TIGHTER than the sum-of-highs because it is a tighter range.

WHY BOTH ARE TRUE: the totals rows are the literal arithmetic of the ranges you can see and edit; the headline band is a summary of the ranges.

Lever	Option A	Option A (low)	Option A (high)	Option B	Option B (low)	Option B (high)	Your choice (low)	Your choice (high)	Notes
Compute	Jetson AGX Thor dev kit	\$5,499	\$5,499	T4000 / T5000 production module @1KU+	\$2,999	\$4,999	\$2,999	\$4,999	Dev kit \$5,499; T5000 module \$4,999 @1KU+, T4000 \$2,999 @1KU+
Arm	6-DOF research arm (WidowX-class)	\$3,100	\$4,600	Purpose-built low-DOF Dynamixel arm	\$700	\$1,400	\$700	\$1,400	WidowX 250 S ~\$3,100 (discontinued); WidowX AI from \$4,545.95 —
Dispenser	Machined one-off carousel	\$500	\$1,200	Injection-molded unit-dose mechanism	\$150	\$400	\$150	\$400	Custom heart of the product. Volume cost = molding + one motor +
Volume assumed:	10,000 units / year								
The volume figures assume design-for-manufacture work not yet d									

Subsystem	Reference part / class	Proto low (USD)	Proto high (USD)	Basis	Notes & source
High-level compute	NVIDIA Jetson AGX Thor dev kit	\$5,499	\$5,499	VERIFIED	Dev kit \$5,499 — verified NVIDIA/VideoCardz 2026. LONG LEAD, allocation
Safety supervisor MCU	STM32H7 dual-core + dev board	\$50	\$120	VERIFIED	Chip price verified STMicroelectronics 2026. ECC memory, FD-CAN.
Dispenser MCU	STM32H7/STM32G4 class + board	\$50	\$100	VERIFIED	Second MCU for the independent dispense/escalation channel.
Manipulation arm	Trossen WidowX-class research arm	\$3,100	\$4,600	VERIFIED	WidowX 250 S ~\$3,100 (discontinued); WidowX AI from \$4,545.95 — verifi
Wrist force/torque (optional)	ATI Nano17 / Mini45	\$3,000	\$7,000	QUOTE-ONLY	QUOTE-ONLY, LONG LEAD — every ATI distributor lists price/delivery as r
Mobile base — drive	ODrive S1 x2 + BLDC hub motors	\$600	\$1,000	VERIFIED	ODrive S1 \$149, Pro \$229, Micro \$89; Botwheel kit from \$279 — verified C
Base chassis / structure	Custom machined + 3D-printed	\$800	\$1,500	ESTIMATE	Prototype machined/3D-printed; volume molded.
Depth cameras (x2)	RealSense D435i / D455	\$700	\$900	VERIFIED	D435i ~\$350, D455 ~\$400 — verified 2026. SUPPLY RISK — Intel winding c
2D LiDAR	Slamtec RPLIDAR A1 / A2	\$100	\$350	VERIFIED	A1 ~\$100 class, A2 higher — verified Slamtec/listings 2026.
Thermal camera	FLIR Lepton-class radiometric	\$200	\$300	ESTIMATE	Trend/dark-detection sensor.
Contact vitals — BP cuff	Oscillometric upper-arm OEM	\$40	\$100	ESTIMATE	Home-validated cuff module.
Contact vitals — SpO2	Medical OEM pulse-ox (Masimo/Nonin class)	\$150	\$400	ESTIMATE	FDA-cleared OEM module; supplier qualification is a lead item.
Contact vitals — temperature	Contact/clinical IR thermometer module	\$20	\$60	ESTIMATE	
Med-dispensing mechanism	Machined carousel + geared motor + optical gate +	\$500	\$1,200	ESTIMATE	The custom heart of the product.
Display / face	Touchscreen + face display panel	\$150	\$400	ESTIMATE	Telepresence + interaction surface.
Audio	Mic array + speaker	\$60	\$150	ESTIMATE	Calls, voice, audio anomaly detection.
Connectivity	Wi-Fi 6E module + independent cellular modem	\$100	\$250	ESTIMATE	Cellular dedicated to escalation path + data plan (recurring, not in BOM).
Battery + power system	Li-ion pack + BMS + DC-DC + fail-safe backup	\$400	\$900	ESTIMATE	Must keep escalation + dispenser lock alive through an outage.
Wiring / connectors / CAN-FD / faste Misc.		\$300	\$700	ESTIMATE	
Total		\$15,819	\$25,529		

Subsystem	Reference part / class	Vol low (USD/unit)	Vol high (USD/unit)	Basis	Notes & source
High-level compute [LEVER]	Jetson T4000 / T5000 production module @1KU+	\$2,999	\$4,999	LEVER	Reads your choice on the Assumptions sheet. T5000 \$4,999 / T4000 \$2,999
Safety supervisor MCU	STM32H7 chip @10k + support components	\$8	\$15	VERIFIED	Chip @10k ~\$8.19 — verified STMicroelectronics 2026.
Dispenser MCU	STM32H7/STM32G4 class @10k	\$6	\$12	VERIFIED	Independent dispense/escalation channel.
Manipulation arm [LEVER]	Purpose-built low-DOF Dynamixel arm	\$700	\$1,400	LEVER	Reads your choice on the Assumptions sheet. Volume = purpose-built arm
Mobile base — drive	Custom integrated hub-motor + driver	\$250	\$450	ESTIMATE	Volume integrated drive hardware.
Base chassis / structure	Molded / cast	\$300	\$600	ESTIMATE	Volume molded.
Depth cameras (x2)	RealSense / 2nd-source Orbbec / ZED	\$400	\$700	ESTIMATE	SUPPLY RISK — qualify a second source (Orbbec ~\$250 / ZED) from the st
2D LiDAR	Slamtec RPLIDAR A1 / A2	\$80	\$250	VERIFIED	A1 ~\$100 class — verified Slamtec/listings 2026.
Thermal camera	FLIR Lepton-class radiometric	\$150	\$250	ESTIMATE	Trend/dark-detection sensor.
Contact vitals — BP cuff	Oscillometric upper-arm OEM	\$25	\$60	ESTIMATE	Home-validated cuff module.
Contact vitals — SpO2	Medical OEM pulse-ox (Masimo/Nonin class)	\$80	\$250	ESTIMATE	FDA-cleared OEM module; supplier qualification is a lead item.
Contact vitals — temperature	Contact/clinical IR thermometer module	\$10	\$35	ESTIMATE	
Med-dispensing mechanism [LEVER]	Injection-molded unit-dose mechanism	\$150	\$400	LEVER	Reads your choice on the Assumptions sheet. Volume = molding + one m
Display / face	Touchscreen + face display panel	\$60	\$180	ESTIMATE	Telepresence + interaction surface.
Audio	Mic array + speaker	\$25	\$70	ESTIMATE	Calls, voice, audio anomaly detection.
Connectivity	Wi-Fi 6E module + independent cellular modem	\$50	\$120	ESTIMATE	Cellular dedicated to escalation path + data plan (recurring, not in BOM).
Battery + power system	Li-ion pack + BMS + DC-DC + fail-safe backup	\$200	\$450	ESTIMATE	Must keep escalation + dispenser lock alive through an outage.
Wiring / connectors / CAN-FD / faste	Misc.	\$150	\$350	ESTIMATE	
Total		\$5,643	\$10,591		