

PRUSA CORE One+

Assembly Guide - the official manual, decoded

8 Chapters	~352 Total steps	~10-16 hr Build time	None Soldering
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Distilled from Prusa's official CORE One+ kit assembly manual (v2321) and Knowledge Base. Difficulty ratings and time estimates are first-timer approximations - always follow the official manual for torque, orientation and safety detail. Pair with the BOM check-off workbook.

Prusa fastener codes

M3x10	Socket-head cap screw (hex drive)
M3x10rT	Ridged T-head - grips a slot, no nut needed
M3x12bT	Countersunk (bevel) head - sits flush
M3nS	Square nut - pressed into a printed pocket
M3nN	Nyloc lock nut - nylon insert resists vibration
M3w	Washer - spreads load under a screw head
sT	Self-tapping - cuts its own thread
Nylon rivet	Push-pin for sheet-metal panels (50 total)

1. Introduction

●■■■■ 1/5 | 15-20 min read | 15 steps | none - read & prep

Builds nothing physical - orientation: how to read the manual, the labelled fastener bags, the spare bag, and the ESD habits you carry through the build.

WALKTHROUGH

- 1 Confirm the right manual (CORE One vs One+).
- 2 Learn the label system - every bag is coded to its steps.
- 3 Find the spare bag for dropped fasteners.
- 4 Read the nut-insertion tip - square nuts press flat & square.
- 5 Set up ESD-safe; touch grounded metal before handling boards.
- 6 Prep a clear, well-lit desk with room to spin the build.

PRO TIPS

- + Sort screws into 12-14 labelled trays; never return them to bags mid-build.
- + Build on a cardboard 'lazy Susan' so you can spin the printer.
- + Keep a flathead, spudger, cutters and masking-tape+marker within reach.

COMMON MISTAKES

- ! Using the wrong manual - the One and One+ diverge.
 - ! Skipping ESD care - static can silently kill electronics.
 - ! Forcing square nuts in crooked.
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2. Base assembly

●●■■■ 2/5 | 45-75 min | 21 steps | Wrench 13-16, 2.5mm Allen, T10 Torx

The foundation: mount the three Z stepper motors, bolt the aluminium extrusions into the bottom frame, add the rubber anti-vibration feet.

WALKTHROUGH

- 1 Insert 6 zip ties into the bottom panel first.
- 2 Fit the Z motors - washer + mount, 4x M3x8 each, protrusions up.
- 3 Match each motor to its named position (cable direction differs).
- 4 Assemble the bottom frame front+left, left+rear, right - keep it square.
- 5 Insert spacer pins to lock it square.
- 6 Attach the 4 feet and mount the frame.

KEY PARTS (counts from the manual)

M3x8 screw x24	M3x4rT screw x12	Zip tie x6
Z motor + mount x3	Feet x4	

PRO TIPS

- + Grab all three tools from box '2 - Electronics & Fasteners' first.
- + Place zip ties before motors - threading later is miserable.
- + Keep the base rectangle true; a skew telegraphs upward.

COMMON MISTAKES

- ! Wrong motor orientation (cable-exit is position-specific).
- ! Over-tightening into extrusion nuts / printed brackets.
- ! Joining profiles out of order - holes won't line up.

3. Back assembly

●●●●■ 4/5 | 1.5-2.5 hr | 52 steps | PH2, needle-nose, 2.5mm Allen, T10 Torx

The electronics spine: PSU and xBuddy board, Wi-Fi module, chamber fans, back panel, and the big FE wiring harness.

WALKTHROUGH

- 1 Build & wire the PSU; prep the xBuddy with thermal pads.
- 2 Install xBuddy + extension board, lock wiring with zip ties.
- 3 Add the Wi-Fi module; press grommets into the back panel.
- 4 Bolt PSU & xBuddy box in, connect power, snap on the cover.
- 5 Build the chamber fans; add rear profiles + back panel.
- 6 Route the FE harness in the numbered order (1-5); plug in the xLCD cable.

KEY PARTS (counts from the manual)

M3x6 screw x12	Nylon rivet x11	M3x4rT screw x6
6-32 terminal x4	M3x30 screw x4	Delta PSU 240W x1
xBuddy board x1	Cooling fan x2	

PRO TIPS

- + Pre-thread the tight Wi-Fi cover screw before mounting.
- + Respect the numbered FE-cable routing order.

- + Seat every rubber grommet before feeding a cable through.

COMMON MISTAKES

- ! Missing/mis-placed thermal pads - board can overheat.
- ! Loose zip ties - cables drift into fans / get pinched.
- ! Forcing FE/LCD connectors before the cable is routed.

4. Heatbed assembly

●●●■ 3/5 | 1-1.5 hr | 40 steps | needle-nose, universal, 13-16, PH2, 2.0 & 2.5 Allen, T10

The moving print bed: wire the heatbed, add the RGB status LED, fit the bed mounts on expansion joints, hang the carriage on the three Z motors.

WALKTHROUGH

- 1 Wire the heatbed; cover the underside cabling.
- 2 Fit 8 expansion joints (let the hot bed grow without warping).
- 3 Install the RGB LED strip + diffuser; route its cable.
- 4 Build & fit the bed mounts (2x LM8UU bearings) + rear spacer.
- 5 Bolt the heatbed to the carriage, tightening evenly.
- 6 Hang on the 3 Z motors, secure the textile sleeve, connect power (GND -> BLACK wire).

KEY PARTS (counts from the manual)

M3nN nyloc x12	Expansion joint x8	M3x4r screw x8
M3x10 screw x8	M3x4bT c'sunk x8	LM8UU bearing x2
Heatbed MK52 x1	RGB LED x1	

PRO TIPS

- + Power polarity: GND pin (left) takes the BLACK wire.
- + Don't over-constrain the bed - expansion joints must move.
- + Anchor the textile sleeve & covers before final mounting.

COMMON MISTAKES

- ! Weak strain relief - a flexing bed cable fatigues and fails.
- ! Reversed GND/black power connector.
- ! Pinched LED/diffuser cable under a bed mount.

5. CoreXY assembly

●●●●● 5/5 | 2-3.5 hr | 83 steps | needle-nose, 2.0 & 2.5 Allen, T10 Torx

The heart of the machine. Build the gantry (rods, rails, carriages), mount both motors with idlers & tensioners, then thread the two GT2 belts. See BELT ROUTING page.

WALKTHROUGH

- 1 Build XY carriages - GT2-20 idler + LM10LUU bearing each.
- 2 Fit smooth rods - 325x10 (x2) & 330x8 (x2); match sizes.
- 3 Build motor mounts - dual GT2-20 idlers on M3x30 (self-cutting).
- 4 Build 2 tensioners - M3nS nut + block + M3x30 only 3-4 turns (leave loose).
- 5 Mount motors, tensioners & X linear rail; remove red shipping pins.
- 6 Fit X & Y motor pulleys (grub screw on shaft flat).

- 7 Thread Y (lower) then X (upper) belt - teeth inward, 4-5 teeth exposed at head.
- 8 Check both belts straight & centred; install into printer.

KEY PARTS (counts from the manual)

XY belt (GT2) x2	GT2-20 idler x12	Motor pulley T16-2GT x2
Rod 325x10 x2	Rod 330x8 x2	LM10LUU x2
M3x35 screw x8	M3x18 screw x15	M3x30 screw x9
X & Y motor x2		

PRO TIPS

- + Keep belt teeth pointing INWARD when forming the motor loop.
- + Lower idlers/bottom holes = Y belt; upper = X belt. Don't cross.
- + Square the gantry (front corners flush) BEFORE tensioning.
- + Lube the tensioner screw tips for smooth adjustment.

COMMON MISTAKES

- ! Pulling a belt all the way out - re-thread the whole loop.
- ! Belt in the wrong hole / crossed - axes fight.
- ! Uneven tension - skews the gantry.
- ! Slack belt / loose grub screw - tooth skipping, layer shifts.

6. Nextruder assembly

●●●●● 5/5 | 2.5-4 hr | 58 steps | universal, 1.5 & 2.5 Allen, T6 & T10 Torx

The print head - longest, fiddliest chapter. Planetary gearbox, hotend, cooling fans, and the LoveBoard.

WALKTHROUGH

- 1 Build the idler (2x 693-2RS bearings) that presses filament to the drive gear.
- 2 Assemble the planetary gearbox (10:1 grip).
- 3 Lubricate the planetary gear before capping - one-shot.
- 4 Fit the thermistor; mount the Nextruder body (protect the bed).
- 5 Install hotend fan & LoveBoard; route the main cable; add swingarm & PTFE.
- 6 Install print fan & hotend; connect all cables; wiring check; cover the board.

KEY PARTS (counts from the manual)

M3x10 screw x11	M3nS nut x8	M3x25 screw x4
693-2RS bearing x2	Spring 15x5 x2	Hotend assy x1
PG assy x1	LoveBoard x1	PTFE 710mm x1

PRO TIPS

- + Use the real T10 Torx driver - the flat one strips screws.
- + Build the Nextruder as a separate module before mounting.
- + Don't skip the planetary-gear grease step.

COMMON MISTAKES

- ! Wrong hotend/heatsink assembly order - cables won't seat.
- ! Half-seated LoveBoard connectors (hence the wiring check).
- ! PTFE tube not fully bottomed - causes jams.

7. Bodywork & Electronics

●●●■ 3/5 | 1.5-2.5 hr | 44 steps | 2.5 & 1.5 Allen, T10, needle-nose, cutters

Wrap the printer in its frame profiles and add the sensor layer: filament sensors, IR sensor, NFC antenna, and the electronics covers.

WALKTHROUGH

- 1 Install front & top profiles; lock the CoreXY assembly.
- 2 Build the side sensor base (7mm steel ball + 2 magnets); test the lever.
- 3 Install the IR filament sensor; connect & cover.
- 4 Fit the side filament sensor; route its cable.
- 5 Stick on the NFC antenna; connect it.
- 6 Wiring check; fit electronics & xBuddy covers, side panels + spool holder.

KEY PARTS (counts from the manual)

M3x4rT screw x28	Nylon rivet x25	M3x8rT screw x6
10x6x2 magnet x2	7mm steel ball x1	IR sensor x1
NFC coil x1	Top profile x3	

PRO TIPS

- + Square the top profiles loosely first, then torque.
- + Use needle-nose to seat sensor connectors in the channels.
- + Route all sensor cables BEFORE fitting the covers.

COMMON MISTAKES

- ! Pinched cable under the xBuddy cover.
- ! Wrong magnet orientation on the side sensor.
- ! Under-seated sensor plugs (hence the wiring check).

8. Trim, Door & xLCD

●●■■■ 2/5 | 1-1.5 hr | 39 steps | 2.5mm Allen, T10 Torx, needle-nose

Finishing: outer panels, xLCD touchscreen + knob, and the door with its seals, magnets and hinges.

WALKTHROUGH

- 1 Fit the top cover - peel foil, test-fit, test the vent flap first.
- 2 Fit the left & right side covers (nylon rivets).
- 3 Build the xLCD - push on the Faston connector & knob, mount in bezel.
- 4 Attach door seals - top first, then sides (airtight for ABS/ASA).
- 5 Fit magnet holders & hinges - inner then outer, correct facing.
- 6 Hang the door panel (peel film) and fit the handle. Done - it's a CORE One+.

KEY PARTS (counts from the manual)

Nylon rivet x14	M3x5rT screw x8	3x8sT screw x4
M3nS nut x4	20x6x2 magnet x2	Hinge pin 2x40 x2
xLCD x1	Upg vent block x1	

PRO TIPS

- + Test the vent flap before screwing the top cover down.
- + Peel each panel's film just before fitting (avoid scratches).
- + Push the Faston connector straight on with needle-nose.

COMMON MISTAKES

- ! Door hinge orientation - inner vs outer, specific order/direction.
- ! xLCD Faston seated at an angle - screen won't light.
- ! Wrong seal order - top before sides.

The CoreXY belt path (get this right)

CoreXY uses **two separate open GT2 belts**. Both motors stay bolted to the rear corners; the belts do the moving. The one rule that prevents most mistakes:

- **X-motor belt = UPPER lane -> upper holes of the print head.**
- **Y-motor belt = LOWER lane -> bottom holes of the print head.**

Each belt end clamps into the print-head holder with **4-5 teeth sticking out**, threaded in through a middle hole and back out a side hole so the teeth self-lock. Form the motor loop with the teeth pointing **inward**. There are 12x GT2-20 idler pulleys (carriages, motor mounts, tensioners) and 2x T16-2GT motor pulleys.

TENSION (set later, in calibration)

Leave the M3x30 tensioner screws only 3-4 turns in during assembly. Final tuning uses the firmware wizard:
left screw = upper (X) belt, right screw = lower (Y) belt, target ~96 Hz upper / ~92 Hz lower, adjusted 1/2-turn at a time, alternating sides to keep the gantry square.

First power-on & the '+' switch

1. **Flash firmware 6.4.0+** - Required for the '+'; adds Chamber Vent Control.
2. **Enable auto venting** - Settings > Hardware > Chamber Vent Control > Auto.
3. **Calibration wizard** - First-layer (loadcell), belt tuning (96/92 Hz), input shaper.
4. **Test print** - Run the USB sample; watch the first layer.

Sources: Prusa CORE One+ kit assembly manual v2321; help.prusa3d.com CoreXY & Nextruder guides; belt-tension article.
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