Neuralink: A Closer Look

How the implant works, what people have done with it in trials, and the questions that still need answers. Includes a guide to the separate PreStocks token.

RESEARCH CUTOFF	OFFICIAL VIDEOS ANALYZED	REGISTERED HUMAN TRIALS	AUTHORSHIP
30 Oct 2026	44 uploads (100%)	PRIME, CONVOY, VOICE	StonkBuilder Community

KEY FINDINGS & VERIFIED EVIDENCE

- Independent authorship. Prepared by StonkBuilder Community; not operated or endorsed by Neuralink Corp. or PreStocks.
- Primary-source discipline. Every technical metric, trial status, and financial figure carries a verified source and consultation date.
- Strict separation of claims. Company demonstrations, clinical study endpoints, peer-reviewed literature, and future speculation are labeled distinctly.

ARCHITECTURAL DIAGRAM: SYSTEM

01 Research cutoff: 30 Oct 2026

02 Official videos analyzed: 44 uploads (100%)

03 Registered human trials: PRIME, CONVOY, VOICE

Official Video Ref: Neuralink Overview, Fall 2025 (3 Dec 2025)

https://community.stonkbuilder.com/neuralink/videos/neuralink-overview-fall-2025-qjdghxyjh7m

SLIDE 01 TAKEAWAY: Start here to inspect the hardware, watch the primary video evidence, and understand the boundary between private Neuralink equity and PreStocks exposure.

Helping people use computers and communicate

Cervical spinal cord injury, brainstem stroke, and amyotrophic lateral sclerosis (ALS) disrupt the motor output cables while cortical computation remains active.

TARGET CONDITIONS	CORE BOTTLENECK	CORTICAL SIGNAL SOURCE	THERAPEUTIC MECHANISM
Quadriplegia, SCI, ALS, apha	Low-bandwidth assistive inpu	Motor & speech motor cortex	Bypass, not biological cure

KEY FINDINGS & VERIFIED EVIDENCE

- Loss of movement and speech. People with severe paralysis or bulbar-onset ALS often rely on eye-trackers or sip-and-puff switches that fatigue quickly and fail outdoors.
- Intact cortical intent. Neurons in the primary motor cortex and ventral premotor/speech areas still fire in coordinated patterns when a person intends to move a hand or speak a word.
- The engineering thesis. If a high-channel wireless implant can read those spikes reliably for years without percutaneous wires, software can route intention directly to computers, voice synthesizers, and mobility devices.

ARCHITECTURAL DIAGRAM: MOVEMENT FLOW

01 Target conditions: Quadriplegia, SCI, ALS, aphasia

02 Core bottleneck: Low-bandwidth assistive inputs

03 Cortical signal source: Motor & speech motor cortex

Official Video Ref: From Neural Signals To Life-Changing Impact (16 Apr 2026)

https://community.stonkbuilder.com/neuralink/videos/from-neural-signals-to-life-changing-impact-8tx-hhtdd2u

SLIDE 02 TAKEAWAY: An intracortical BCI creates a digital bypass around injured nerves; it does not biologically regenerate the spinal cord or halt ALS neurodegeneration.

The three parts of the Neuralink system

Prior intracortical arrays proved humans could control cursors with thought, but rigid silicon needles and skull-mounted pedestals limited scale and home use.

ELECTRODE CHANNELS	CORTICAL THREADS	FORM FACTOR	CHARGING & DATA
1,024 per N1 implant	64 flexible polymer threads	Flush with skull, wireless	Inductive power + Bluetooth

KEY FINDINGS & VERIFIED EVIDENCE

- No percutaneous connector. The N1 implant sits beneath the scalp in a cranial recess, eliminating the skin-penetrating pedestal used by legacy laboratory research systems.
- Flexible polymer threads. Instead of a rigid bed of silicon spikes that shifts against brain micromotion, 64 ultra-thin threads flex with cortical pulsatility.
- Robotic insertion at scale. Because flexible threads cannot be pushed into tissue by hand, the custom R1 surgical robot inserts them needle-by-needle under micron-scale optical guidance.

ARCHITECTURAL DIAGRAM: SYSTEM

01 Electrode channels: 1,024 per N1 implant

02 Cortical threads: 64 flexible polymer threads

03 Form factor: Flush with skull, wireless

Official Video Ref: Neuralink Update, Summer 2025 (27 Jun 2025)

https://community.stonkbuilder.com/neuralink/videos/neuralink-update-summer-2025-fasmejn_5gs

SLIDE 03 TAKEAWAY: Neuralink treats the implant, insertion robot, and decoding software as one vertically integrated medical device platform.

From a brain signal to a computer command

From extracellular action potentials in motor cortex to calibrated cursor velocity, click intent, and synthesized speech tokens.

SIGNAL TYPE	PEAK CURSOR RATE	PRETRAINING CORPUS	LATENCY TARGET
Action potentials (spikes) +	11.32 bits per second (BPS)	>50,000 hrs neural data	Real-time closed loop (<50 m

KEY FINDINGS & VERIFIED EVIDENCE

- 1. On-chip amplification & spike detection. Custom ASICs inside the N1 enclosure digitize microvolt voltage fluctuations across 1,024 electrodes and extract spike events.
- 2. Wireless telemetry. Packetized neural features stream wirelessly to the Neuralink App on the user's computer, tablet, or phone.
- 3. Adaptive neural decoding. Machine-learning models map firing patterns to 2D velocity vectors, discrete clicks, or phoneme probabilities, using self-supervised pretraining to reduce daily recalibration.

ARCHITECTURAL DIAGRAM: MOVEMENT FLOW

01 Signal type: Action potentials (spikes) + LFP

02 Peak cursor rate: 11.32 bits per second (BPS)

03 Pretraining corpus: >50,000 hrs neural data

Official Video Ref: Neuralink Overview, Fall 2025 (3 Dec 2025)

https://community.stonkbuilder.com/neuralink/videos/neuralink-overview-fall-2025-qjdghxyjh7m

SLIDE 04 TAKEAWAY: Closing the visual or auditory feedback loop lets participants adapt alongside the model, turning raw cortical firing into fluent control.

The implant and the surgery

Engineering the needle, cartridge, optical coherence tomography (OCT) imaging, and the June 2026 transdural surgical milestone.

ELECTRODES / THREAD	INSERTION SPEED	NEEDLE FABRICATION	JUN 2026 MILESTONE
16 electrodes × 64 threads	~1.5s per thread (R1 upgrade	In-house femtosecond laser m	First clinical transdural su

KEY FINDINGS & VERIFIED EVIDENCE

- N1 hermetically sealed package. Combines low-power recording electronics, wireless radio, and an inductively rechargeable battery in a coin-sized enclosure.
- R1 optical guidance. Multiple cameras and imaging systems map cortical blood vessels so the needle places threads within microns of target neurons while avoiding vasculature.
- Deleting the durotomy (30 Jun 2026). At UHN Toronto Western Hospital, Neuralink inserted threads straight through the tough dura mater (>10× thicker than a thread) without cutting it open.

ARCHITECTURAL DIAGRAM: TRANSDURAL

01 Electrodes / thread: 16 electrodes × 64 threads

02 Insertion speed: ~1.5s per thread (R1 upgrade)

03 Needle fabrication: In-house femtosecond laser milling

Official Video Ref: Our First Transdural Procedure | Neuralink (30 Jun 2026)

https://community.stonkbuilder.com/neuralink/videos/our-first-transdural-procedure-f8p2mamnbge

SLIDE 05 TAKEAWAY: Keeping the dura intact reduces surgical complexity and cerebrospinal fluid exposure, a critical step toward safer, repeatable procedures.

Key moments from 2019 to 2026

Every milestone anchored to dated regulatory filings, clinical registries, and official video records.

2019–2022
Preclinical prototypes & R1

MAY 2023
FDA IDE clearance for PRIME

JAN 2024
First human N1 implant

JAN–OCT 2026
21 participants, VOICE & tra

KEY FINDINGS & VERIFIED EVIDENCE

- Preclinical validation (2019–2022). Evolved from wired USB-C research boards (2019) to wireless porcine recording (2020), macaque MindPong (2021), and full R1 robot verification (2022).
- First-in-human launch (2023–2024). Opened PRIME (NCT06429735) in late 2023, completed the first human implant in January 2024, and resolved early thread-retraction challenges via decoding and deeper insertion.
- Multi-study clinical expansion (2025–2026). Added CONVOY (robotic arm), VOICE (NCT07224256, speech restoration), international sites (Canada, UK), and reached 21 participants by 28 January 2026.

ARCHITECTURAL DIAGRAM: TIMELINE VISUAL

01 2019–2022: Preclinical prototypes & R1 robot

02 May 2023: FDA IDE clearance for PRIME

03 Jan 2024: First human N1 implant

Official Video Ref: Neuralink Live Update - July 2024 (26 Aug 2024)
https://community.stonkbuilder.com/neuralink/videos/neuralink-live-update-july-2024-ux5aikmra-e

SLIDE 06 TAKEAWAY: Track progress by completed clinical milestones and peer-reviewed data rather than aspirational calendar targets.

Using a computer at home

How PRIME participants use Telepathy unsupervised at home for CAD, gaming, digital painting, writing, and communication.

REGISTERED STUDY	ENROLLED COUNT	PEAK CURSOR BPS	DAILY USAGE
PRIME · NCT06429735	21 participants (as of 28 Ja	11.32 bits per second	Multi-hour independent home

KEY FINDINGS & VERIFIED EVIDENCE

- High-throughput cursor and click control. Participants map imagined or attempted movements to smooth cursor trajectories and multi-button clicks across macOS, Windows, and iOS.
- Creative and technical workflows. Official videos document Audrey creating digital artwork (5hYg3rUfLiQ, R03-DWvWmAY), participants signing their physical handwriting (MYKEycYqRpk), CAD modeling, and strategy gaming.
- First-participant transparency. After partial thread retraction reduced raw channels in the first participant, software switched to population-level local field potentials (LFPs) and restored higher BPS than baseline.

ARCHITECTURAL DIAGRAM: MOVEMENT FLOW

01 Registered study: PRIME · NCT06429735

02 Enrolled count: 21 participants (as of 28 Jan 2026)

03 Peak cursor BPS: 11.32 bits per second

Official Video Ref: Creating Art With The Mind | Neuralink (15 May 2026)
https://community.stonkbuilder.com/neuralink/videos/creating-art-with-the-mind-5hyg3rufliq

SLIDE 07 TAKEAWAY: Real-world utility depends on sustained home reliability and low calibration overhead across months, not just peak single-session speed.

The VOICE trial: turning intended speech into audio

Decoding speech motor cortex activity in real time for participants with ALS and severe dysarthria.

REGISTERED STUDY	FIRST-WEEK SPEED	WORD ERROR RATE	VOICE OUTPUT
VOICE · NCT07224256	75 WPM (company-reported)	5.8% WER (single participant	Personalized natural voice c

KEY FINDINGS & VERIFIED EVIDENCE

- Direct speech-motor decoding. Instead of spelling letter-by-letter with a 2D cursor, VOICE records directly from cortical areas governing vocal-tract musculature (nl_speech, ct_voice).
- Speaking in one's own voice. In March–October 2026 updates (u8mmn9lOIyw, _j806JHhCRo, emi5O7LeiyU), participants Kenneth and Terry trained decoders by miming and then thinking words, heard aloud in their pre-ALS voice.
- 72-hour in-home engineering sprint (29 Oct 2026). Engineers worked directly in a participant's home (emi5O7LeiyU) to prototype low-latency conversation tools, silence false triggers, and streamline everyday

ARCHITECTURAL DIAGRAM: SPEECH FLOW

01 Registered study: VOICE · NCT07224256

02 First-week speed: 75 WPM (company-reported)

03 Word error rate: 5.8% WER (single participant)

Official Video Ref: Speaking With The Mind | Neuralink (18 Sep 2026)
https://community.stonkbuilder.com/neuralink/videos/speaking-with-the-mind-_j806jhhcro

SLIDE 08 TAKEAWAY: Speech neuroprostheses are advancing rapidly, supported by both Neuralink's VOICE trial and 2025 Nature / Nature Neuroscience peer-reviewed studies.

Controlling robotic arms and wheelchairs

Translating high-dimensional cortical intent into multi-joint robotic manipulation and powered mobility.

ROBOTIC ARM STUDY	WHEELCHAIR DEMO	DEGREES OF FREEDOM	CURRENT STAGE
CONVOY feasibility trial	Jul 2026 camera-guided contr	Continuous proportional velo	Supervised clinical feasibil

KEY FINDINGS & VERIFIED EVIDENCE

- CONVOY Assistive Robotic Arm (ARA). Launched in November 2024 so PRIME participants could map neural signals to a multi-axis robotic arm for feeding, grasping, and physical tasks (nl_convoy, yt_iINSOB63WnQ).
- Telepathic wheelchair control (Jul 2026). Videos 78m32VSOMBk and V06QXVSWxDs show a participant driving a powered wheelchair via a live camera feed where cursor displacement controls direction and speed.
- Safety gates for physical actuators. Moving heavy physical hardware requires collision avoidance, dead-man stops, latency bounds, and sensory feedback before unsupervised outdoor use.

ARCHITECTURAL DIAGRAM: TRIALS MATRIX

01 Robotic arm study: CONVOY feasibility trial

02 Wheelchair demo: Jul 2026 camera-guided control

03 Degrees of freedom: Continuous proportional velocity

Official Video Ref: Telepathic Wheelchair Control | Neuralink (23 Jul 2026)
https://community.stonkbuilder.com/neuralink/videos/telepathic-wheelchair-control-78m32vsombk

SLIDE 09 TAKEAWAY: Controlling physical robotics introduces mechanical safety requirements far stricter than moving a screen cursor.

Blindsight: research into artificial vision

Why restoring sight by stimulating primary visual cortex (V1) is a fundamentally different engineering problem from reading motor cortex.

FDA STATUS	TARGET REGION	MECHANISM	HUMAN CLINICAL DATA
Breakthrough Device (Sep 202	Primary visual cortex (V1)	Electrical microstimulation	None published as of Oct 202

KEY FINDINGS & VERIFIED EVIDENCE

- Bypassing eye and optic nerve. Blindsight aims to capture video from external glasses and stimulate V1 electrodes so people who lost both eyes and optic nerves perceive structured phosphenes (nl_blindsight).
- What FDA Breakthrough Designation means. Granted in September 2024, it provides prioritized FDA review interaction for serious unmet needs (fda_breakthrough)—it is not clinical trial results or commercial
- Preclinical macaque evidence. In the Summer 2025 update (FASMejN_5gs), engineers reported monkeys making eye movements toward virtual targets evoked by Blindsight stimulation.

ARCHITECTURAL DIAGRAM: TRIALS MATRIX

01 FDA status: Breakthrough Device (Sep 2024)

02 Target region: Primary visual cortex (V1)

03 Mechanism: Electrical microstimulation (write)

Official Video Ref: Neuralink Update, Summer 2025 (27 Jun 2025)

https://community.stonkbuilder.com/neuralink/videos/neuralink-update-summer-2025-fasmejn_5gs

SLIDE 10 TAKEAWAY: Keep Blindsight's stimulation safety, tissue charge limits, and regulatory state strictly separate from Telepathy's motor-recording results.

How Neuralink compares with other brain interfaces

Every neural interface balances spatial resolution and information throughput against surgical invasiveness.

INTRACORTICAL (N1)	RIGID UTAH ARRAY	SUBDURAL ECOG	ENDOVASCULAR / EEG
Single-neuron spikes · crani	Proven 20-yr history · percu	Cortical surface · high-gamm	Blood-vessel or scalp · lowe

KEY FINDINGS & VERIFIED EVIDENCE

- Intracortical flexible threads (Neuralink N1). Places 1,024 electrodes inside the cortex for single-neuron spike resolution in a wireless package, requiring robotic craniotomy (nl_tech).
- Cortical surface (ECoG) & rigid microarrays. ECoG grids sit on the brain surface without penetrating parenchyma (strong speech results in academic trials); Blackrock Utah arrays penetrate cortex with rigid needles.
- Endovascular (Synchron) & non-invasive (EEG). Endovascular stents reach motor cortex via the jugular vein without open craniotomy but record broader vessel-wall signals; scalp EEG avoids surgery entirely at low

ARCHITECTURAL DIAGRAM: BCI COMPARISON

01 Intracortical (N1): Single-neuron spikes · cranial surgery

02 Rigid Utah array: Proven 20-yr history · percutaneous

03 Subdural ECoG: Cortical surface · high-gamma LFP

Official Video Ref: Automating Neurosurgery with Robotics | Neur (29 Apr 2026)
https://community.stonkbuilder.com/neuralink/videos/automating-neurosurgery-with-robotics-ko53gwuqzuq

SLIDE 11 TAKEAWAY: No single BCI modality dominates every patient profile: clinical choice depends on whether a patient needs high-DOF cursor/voice throughput or a minimally invasive switch.

What needs to happen before wider access

Moving from 21 early-feasibility participants to an approved, reimbursed medical device.

CURRENT AUTHORIZATION	COMMERCIAL CLEARANCE	CHRONIC DURABILITY	PATIENT SUPPORT
Investigational (IDE / clini	Requires FDA PMA / marketing	Multi-year encapsulation & h	Calibration, cybersecurity,

KEY FINDINGS & VERIFIED EVIDENCE

- Multi-year hardware survivability. Implants must resist corrosive cerebrospinal fluid, mechanical strain, battery degradation, and gliosis over 5–10+ years (fda_bci, yt_YreDYmXTYi4).
- Surgical reproducibility. Transdural insertion (F8p2MamNBgE) and automated R1 workflows (KO53gwuqZUQ) must prove safe across diverse hospital neurosurgery teams, not just flagship centers.
- Pivotal trials & reimbursement. FDA Class III implanted neurological devices require rigorous pivotal trial endpoints, manufacturing quality systems, long-term follow-up, and payer coverage (fda_neuro).

ARCHITECTURAL DIAGRAM: TRANSDURAL

01 Current authorization: Investigational (IDE / clinical trial)

02 Commercial clearance: Requires FDA PMA / marketing auth

03 Chronic durability: Multi-year encapsulation & hermeticity

Official Video Ref: Automating Neurosurgery with Robotics | Neur (29 Apr 2026)

https://community.stonkbuilder.com/neuralink/videos/automating-neurosurgery-with-robotics-ko53gwuqzuq

SLIDE 12 TAKEAWAY: Early feasibility videos prove what is possible; multi-year clinical data and regulatory review determine when a device becomes standard medical care.

What could come next?

A disciplined framework for evaluating what Neuralink can do today, what comes next, and what remains speculative.

TIER 1 (DEMONSTRATED)	TIER 2 (PLAUSIBLE)	TIER 3 (SEPARATE R&D)	TIER 4 (SPECULATIVE)
Cursor, voice & arm feasibil	Zero-shot calibration & tact	Blindsight V1 stimulation	Consumer enhancement & AI me

KEY FINDINGS & VERIFIED EVIDENCE

- Tier 1 — Demonstrated in trials. Unsupervised home computer control (PRIME), early natural-voice speech synthesis (VOICE), and supervised assistive robotic arm/wheelchair tests (CONVOY).
- Tier 2 — Plausible extensions. Faster conversational speech (>100 WPM), closed-loop somatosensory touch feedback for prosthetics, and streamlined transdural outpatient procedures.
- Tier 3 & Tier 4 — Separate programs vs. speculation. Blindsight requires its own human clinical trials; consumer memory or 'mind reading' claims remain outside current neurobiology.

ARCHITECTURAL DIAGRAM: EVIDENCE TIERS

01 Tier 1 (Demonstrated): Cursor, voice & arm feasibility

02 Tier 2 (Plausible): Zero-shot calibration & tactile loop

03 Tier 3 (Separate R&D): Blindsight V1 stimulation

Official Video Ref: An Engineering Sprint For Speech Restoration (29 Oct 2026)

https://community.stonkbuilder.com/neuralink/videos/engineering-sprint-for-speech-restoration-emi5o7leiyu

SLIDE 13 TAKEAWAY: Evaluate every future claim by asking: Is the neural code known, does the hardware reach that brain region safely, and has a human trial tested it?

The questions that still need answers

Clinical, technical, ethical, and financial risks every researcher and reader should weigh.

SURGICAL RISK	SIGNAL STABILITY	DATA GOVERNANCE	LONG-TERM CARE
Hemorrhage, infection, dura	Thread micromotion & scar ti	Continuous cortical telemetr	Device lifecycle, upgrades &

KEY FINDINGS & VERIFIED EVIDENCE

- Thread retraction & chronic signal longevity. First-participant thread retraction showed that brain motion can pull electrodes out of cortex; long-term 2–5 year channel retention curves are needed.
- Neural privacy & decoder false positives. Speech decoders must only vocalize intended speech (emi5O7LeiyU) and never leak private inner monologue without explicit user gating.
- Trial dependency & corporate continuity. Implanted participants rely on ongoing software support, cloud/app compatibility, and surgical follow-up.

ARCHITECTURAL DIAGRAM: EVIDENCE TIERS

01 Surgical risk: Hemorrhage, infection, dura damage

02 Signal stability: Thread micromotion & scar tissue

03 Data governance: Continuous cortical telemetry privacy

Official Video Ref: Translating Thought To Speech | Neuralink (24 Mar 2026)
https://community.stonkbuilder.com/neuralink/videos/translating-thought-to-speech-u8mmn9loiyw

SLIDE 14 TAKEAWAY: Look for peer-reviewed clinical publications reporting full cohort denominators, adverse-event rates, and multi-year signal retention.

The NEURALINK PreStocks token: what you hold and what you risk

How eligible non-U.S. readers can inspect or access Neuralink-related economic exposure on Solana—and how it differs from owning Neuralink Corp. stock.

PRODUCT & SYMBOL	SOLANA MINT	SHAREHOLDER RIGHTS	ELIGIBILITY
Neuralink PreStocks · NEURAL	PrekqL…bw9S (Token-2022)	None (0% equity, vote or div	Non-U.S. only; 36 jurisdicti

KEY FINDINGS & VERIFIED EVIDENCE

- Not a Neuralink share. Neuralink Corp. is private (last announced round: $650M Series E at reported $9B pre-money in Jun 2025). NEURALINK is issued by PreStocks and confers no shareholder or voting rights (prestocks_faq).
- Verified contract address. Only PrekqLJvJ3qVdXmBGDiexvwUTF4rLFDa6HWS4HJbw9S on Solana matches PreStocks' official registry (prestocks_api, solscan_nl).
- Fees, issuer controls & liquidity risk. The Token-2022 mint carries a built-in transfer fee (1% on 30 Oct 2026; 3% on 30 Sep 2026) and issuer authority (WV9PJN…ti5Wc) for freeze, pause, and permanent delegate.

ARCHITECTURAL DIAGRAM: PRESTOCKS PATHWAY

01 Product & symbol: Neuralink PreStocks · NEURALINK

02 Solana mint: PrekqL…bw9S (Token-2022)

03 Shareholder rights: None (0% equity, vote or dividend)

SLIDE 15 TAKEAWAY: Always verify eligibility at prestocks.com/neuralink, check the full 44-character mint on Solscan, and distinguish provider marks from executable quotes.

Sources and further reading

Explore all 14 topic guides, 44 official video analyses, and the canonical PreStocks stock/token explainer.

TOPIC & GUIDE PAGES	OFFICIAL VIDEO LIBRARY	STOCK/IPO EXPLAINER	DECK DOWNLOADS
14 canonical pages (/neurali	44 individual video articles	/prestocks/neuralink-stock	Web viewer + PPTX + PDF

KEY FINDINGS & VERIFIED EVIDENCE

- Read the technical & clinical cluster. Start with How Neuralink works, N1 implant & R1 robot, and PRIME, CONVOY & VOICE trials.
- Browse the verified video archive. Filter all 44 official @neuralink uploads by topic, year, and format at /neuralink/videos.
- Review the investment & token guides. Read how to access NEURALINK PreStocks alongside the canonical Neuralink stock & IPO explainer.

ARCHITECTURAL DIAGRAM: VERIFY MINT

01 Topic & guide pages: 14 canonical pages (/neuralink/...)

02 Official video library: 44 individual video articles

03 Stock/IPO explainer: /prestocks/neuralink-stock

SLIDE 16 TAKEAWAY: Questions or corrections? Message @stonkbuilder8 on X. StonkBuilder support will never ask for your recovery phrase.