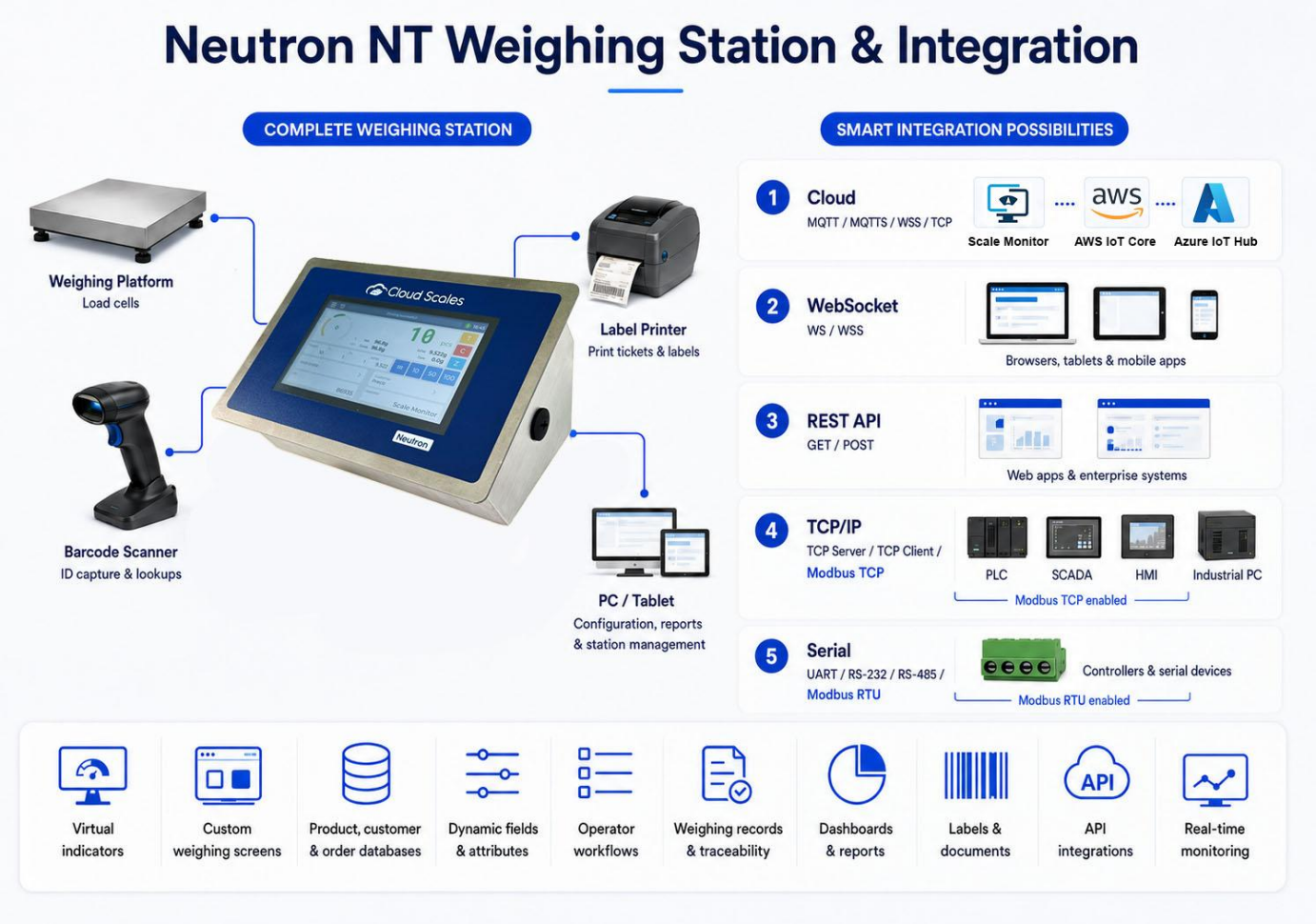
NEUTRON NT

Smart customizable touchscreen scale with I/O and cloud connectivity

- Build smart weighing stations
- Automate with digital I/O
- Integrate with Scale Monitor, cloud, ERP, MES and IoT

Cloud Scales



Product overview

Traditional indicators often force users to adapt their process to the scale: manual data entry, separate PCs or gateways, limited screen customization and costly service visits for even simple changes.

CloudScale Neutron NT solves this by giving users a flexible DIY weighing platform with a 7-inch touchscreen. Create custom fields, databases, build your own workflows and virtual indicators, and connect barcode scanners, POS printers, label printers and external equipment directly to the weighing process.

Remote management helps reduce downtime and service cost. Settings, diagnostics, and configuration can be accessed remotely, so many issues can be solved immediately from the office without waiting for an on-site visit.

The result is a complete, customized weighing workstation with less manual work, fewer errors and lower operating costs.

Its stainless-steel IP67 housing also makes Neutron NT suitable for demanding food, pharmaceutical, industrial and wash-down environments.

Key benefits

- Complete smart weighing terminal with integrated 7-inch touchscreen
- Flexible DIY platform for custom fields, workflows, databases and virtual indicators
- Direct connection of analogue load cells, barcode scanners, POS printers, label printers and external equipment
- Digital I/O for dosing, checkweighing, tolerance control, start/stop signals and process automation
- Ethernet, Wi-Fi and Bluetooth BLE connectivity options
- Supports UART, RS-232 and RS-485 for legacy equipment and industrial integration
- Supports Modbus RTU and Modbus TCP for direct connection to HMI panels, PLCs and SCADA systems
- Connects directly to Scale Monitor, cloud platforms, ERP, MES, WMS and custom applications
- Remote configuration, diagnostics and support reduce downtime and avoid unnecessary service visits
- Remote assistance enables faster setup and troubleshooting directly from office
- Reduces manual data entry, local PC dependency and operating cost
- Stainless-steel IP67 housing for demanding food, pharmaceutical, industrail and wash-down environments

Typical use cases

- Custom weighing workstations with touchscreen-guided workflows
- Food, pharmaceutical and industrial weighing applications
- Checkweighing, counting, dosing, filling, batching, and process weighing
- Label-printing and barcode-based traceability stations
- Weighing systems connected to customer databases, ERP, MES, WMS or quality systems
- Smart production systems where weighing controls external equipment or process signals
- Digital weighing stations with custom fields, operator identification and data capture
- Remote monitoring, diagnostics, support and calibration assistance
- Retrofit projects replacing outdated indicators, local PC software or separate communication gateways
- OEM and system-integrator projects requiring a configurable smart weighing terminal

Main functions

Weighing core	Automation I/O	Cloud & local communication
Direct connection of analog load cells through a 4-channel, 24-bit ADC with programmable digital filtering.	Six configurable opto-isolated digital inputs and six photoMOS outputs for scale and process control tasks.	Connection to Scale Monitor, MQTT/MQTTS, WebSocket/WSS, REST API, TCP, Bluetooth BLE, Wi-Fi and optional Ethernet.
Supports multi-range and multi-division scale configuration, zero tracking, zero at power-on, stability detection and calibration with up to 8 linearization points per scale.	Inputs can be used for functions such as zero, tare, start/stop signals, state monitoring or counter mode.	Two-way communication for weighing data upload, command exchange, configuration, diagnostics and remote support.
One Neutron NT can manage up to four scale channels, making it suitable for compact single-scale systems and multi-platform installations.	Outputs can be controlled by commands or by scale logic for tolerance, out-of-tolerance, quick dosing, slow dosing and similar applications.	Provides a consistent integration layer for cloud dashboards, ERP, MES, WMS, IoT workflows and custom software applications.

Why Neutron NT?

Modern weighing systems need more than a traditional indicator with a serial output. They require secure cloud connectivity, local process control, remote service, traceable data and seamless integration with business systems.

Neutron NT brings all of this together in one compact weighing terminal, combining a large customizable touchscreen, high-performance weighing electronics, digital I/O and industrial IIoT connectivity.

Designed to work seamlessly with Scale Monitor, Neutron NT enables flexible local operation, centralized data management and remote configuration, monitoring and support.

For scale builders and OEMs

• Build new connected scales without developing the full electronics stack from scratch
• Connect load cells directly and configure each weighing channel independently
• Add secure cloud connectivity and remote diagnostics from the beginning
• Reduce development time for smart indicators and weighing terminals

For industrial users and integrators

• Standardize weighing data and automation signals in one device
• Use Scale Monitor for dashboards, data collection and remote monitoring
• Integrate weighing data with ERP, MES, WMS, QA and IoT platforms
• Add local I/O functions for dosing, tolerance checks and process control

Smart Integration Possibilities

Neutron NT is designed to connect weighing systems with modern industrial and business environments.

- Connect directly to PLC, SCADA and automation systems via Modbus RTU or Modbus TCP
- Exchange weighing data with ERP, MES, WMS and other business software
- Use Ethernet, Wi-Fi, Bluetooth, RS-232 and RS-485 for flexible system integration
- Connect barcode scanners, printers and other peripheral devices
- Use digital inputs and outputs for local process control, alarms and automation
- Send weighing data securely to Scale Monitor for remote monitoring, management and support
- Combine local operation and cloud connectivity in one system
- Run multiple integration paths in parallel without additional gateways or industrial PCs

Security

Neutron has security built into it's core - device-level security features as Secure Boot and Flash Encryption, helping protect firmware integrity and sensitive data stored on the device. Only trusted firmware can be executed, while encrypted storage and secure communication help reduce risk in unattended, industrial, and OEM deployments.

Enterprise Wi-Fi	Encrypted communication	Secure boot
Supports secure Wi-Fi connection, including WPA2, WPA3, and enterprise authentication for professional and corporate IT environments.	Supports encrypted data transfer using TLS secure protocols such as HTTPS, MQTTS, and WSS for safe cloud and server communication.	Ensures that only trusted and authorized firmware can run on the device, helping protect the system from unauthorized modifications.
Flash encryption	**Unique MID and PIN**	**OTA**
Protects sensitive data stored inside the device by encrypting the internal flash memory.	Each Neutron module has a unique module ID and PIN for secure identification, configuration, and remote support access.	Supports secure over-the-air firmware updates, allowing remote upgrades, maintenance, and feature improvements without physical access to the device.

OEM version/private label

OEM smart scale solutions for scale manufacturers

Neutron NT is also available as an OEM smart scale platform for manufacturers who want to add modern weighing electronics, I/O functions and cloud support to their products. Instead of developing a new displayless scale core, IoT gateway, firmware layer, management platform and security architecture from scratch, manufacturers can integrate Neutron NT directly into their own scales, indicators, terminals or weighing systems.

We can support OEM customers with custom PCB design, private label versions, custom firmware, branded cloud solutions and application-specific weighing workflows. This allows manufacturers to offer a complete digital weighing package under their own brand, while reducing development time, project risk and engineering cost.

Custom PCB	Private label	Custom firmware
Neutron NT-based hardware adapted to the manufacturer's scale, enclosure, connector, load-cell wiring or installation requirements.	Product branding adapted to the manufacturer's own product family.	Dedicated firmware behavior, weighing workflows, I/O logic, protocols, configuration logic, data format or device-specific functions.
Branded cloud	**Branded Scale Monitor option**	**Scale protocol integration**
Cloud platform for managing connected interfaces, devices, firmware, parameters, diagnostics, and customer deployments.	Optional end-user cloud platform for weighing apps, virtual indicators, traceability, and remote scale management.	Support for manufacturer-specific scale behavior, calibration workflow, I/O functions, serial commands and weighing data formats.

Result for manufacturers: faster time to market, lower development cost, reduced technical risk and a practical way to add smart scale functionality, secure connectivity and cloud integration to new weighing systems.

Technical specifications

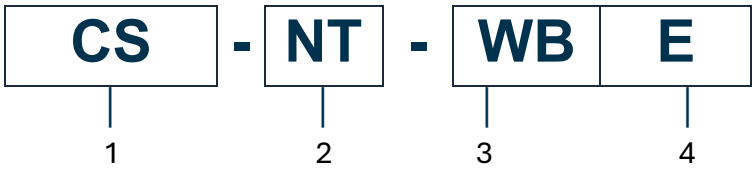
General	Description
Product name	CloudScale Neutron NT/ Neutron NT
Product type	Compact smart scale with touch screen display and Neutron NS scale
Primary function	HMI device for smart factories, production for demanding
Serial interfaces	UART, RS-232, RS-485
Network interfaces	Wi-Fi, Bluetooth BLE and optional Ethernet depending on version
Cloud integration	Scale Monitor Cloud, AWS IoT Core, Azure IoT Hub, HiveMQ, EMQX, Mosquitto, local cloud platforms, WebSocket client (WS & WSS), REST/API integrations and server applications
Business software integration	ERP, MES, WMS, QA systems, data collection and traceability applications
Communication mode	Two-way communication: weighing data upload and command/configuration exchange
Configuration	Remote and local configuration depending on deployment scenario
Firmware	Upgradeable firmware architecture; OTA support throught HTTPS or Cloud Management Platform CMP
Installation	OEM integration or external connection to existing scales
Application area	Industrial weighing, laboratories, logistics, production, service and maintenance
Display	
Display type	7" IPS TFT LCD touch screen
Resolution	1024x600 px
Display size	165x98 mm (WxH)
Viewing angle	160°
Brigthness	400 cd/m^2 typical, adjustable
Color depth	16.7 million colors, 8-bit
Housing	
Material	stainless steel AISI304
Cable glands	plastic with IP68 (optional stainless steel)
IP protection	IP67
Scale and ADC	
ADC	4-channel, 24-bit sigma-delta ADC Note: The ADC has 4 multiplexed channels. Only one scale is converted at a time.
Filters	Programmable hardware and software filters, up to 4,800 conversions per second
Internal/displayable resolution	up to 22 bits (~4.2 million internal divisions), depending on filtering and update rate
No. of scales	Up to 4 scales. For each scale you can set: • Measurement unit (freely configurable text) • Scale type: multi-division / multi-range (up to 3 ranges per scale) • Free configuration of division and maximum capacity for each range • Zero tracking • Zero at power-on (auto zero on boot) • Digital filter settings • Number of divisions for stability detection • Stability window • Calibration with up to 8 linearization points per scale
No. of load cells	Connect up to 16 analog load cells (350 Ω) Load cell supply 5Vdc ± 5%, max 250 mA Minimum load cell signal per division: 0.023 µV Minimum load cell signal: 1 mV/V (lower sensitivities are supported but maximum resolution might be reduced)
Load cell connection	4-wire connection (without sense lines; REF+ and REF– must be closed with jumpers)

	6-wire connection (with sense/reference lines)	
Input & output		
Digital inputs	6 x configurable inputs (optocouplers)	10-24Vdc +/- 5%, min/max current 4/35 mA
	Digital input scan be configured either as an ON/OFF input with real-time state updates via Bluetooth or Cloud, or as a counter input. Inputs can be used also for scale function such as zero, tare, start/stop dosing etc. In counter mode, inputs support counting frequencies of up to 1,000 Hz. Counter values are reported at a fixed update interval of 5 seconds. The maximum supported counter value is 18.4 billion (2^64 – 1). The current input state or counter value can be requested at any time by sending a command. Counters can be freely set or reset. Note: Although any GPIO can be assigned as a counter input, Neutron is limited to four simultaneous active counters due to hardware constraints.	
Digital outputs	6 x fotomosfet optocoupler outputs	5-24Vdc, max current 150 mA
	Digital output can be controlled via command sent via Bluetooth or cloud. Digital outputs can be controlled also via scale depending on the application for instance activated in tolerance, out of tolerance, quick dosing, slow dosing etc.	
Wi-Fi		
Frequency	2.4 GHz Wi-Fi (IEEE 802.11b/g/n) 2412 MHz to 2484 MHz (Channels 1–14).	
Range	up to 50 m indoor and up to 150 m outdoor	
Encryption	Open/none, WPA2/3-PSK, WPA2/3-Enterprise (EAP-TLS, EAP-TTLS)	
Antenna	External with self adhesive tape included; connector IPEX MHF1 (u.FL)	
Bluetooth BLE		
BLE 5.0	Supports Bluetooth to bidirectional serial redirection to UART/RS-232 or RS485 port	
Ethernet (optional – see product list)		
10BaseT/100BaseTX Mb/s	Support Auto Negotiation (Full and half duplex, 10 and 100-based) LED outputs (Full/Half duplex, Link, Speed, Active)	
Network		
DHCP	Yes	
Static IP	Yes	
DNS & mDNS	Yes	
NTP	Yes	
MQTT	MQTT (unencrypted), MQTTS/WSS (encrypted with bundle CA and support for own certificate) Protocol version: 3.1.1, Supports: QoS 0-2, custom URL/IP&port, client ID/credentials, mTLS, TLS	
WebScoket client	WS (unencrypted), WSS (encrypted with bundle CA and support for own certificate); supports also BASIC authorization	
REST	GET/POST with support for HTTP or HTTPS using your own certificate and optional token	
TCP/IP	Client and server	
Supported clouds	Scale Monitor Cloud, Amazon AWS, Microsoft Azure, HiveMQ, EMQX, Mosquitto	
Modbus TCP	Yes, TCP port 502 via Wi-Fi or Ethernet interface	
Serial connection		
UART	Yes	
RS-232	Yes, maximum distance up to 15 m	
RS-485	Yes, with optional address configuration from 0-255; maximum allowed distance: 1200 m with shielded 2 x 24AWG twisted pair with outer braid + aluminum strip	

Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Data bits	7 or 8
Parity	None, even, odd
Modbus	Yes, RTU with configurable slave ID via RS-232 or RS-485 interface
Supply & environment	
Power supply	220~240Vac
Cable & connector	EU plug, length 2 m
Temperature range	-10 ~ +40 °C
Humidity	Max 85% non-condensing
Dimensions	
CS-NT-WB	173x259x117 mm (LxWxH)

Ordering information

Neutron NT has the following product code structure:



1) Product family

CS	CloudScale family

2) Model family

NT	Neutron touch

3) Wi-Fi/Bluetooth Interface

WB	Wi-Fi & Bluetooth

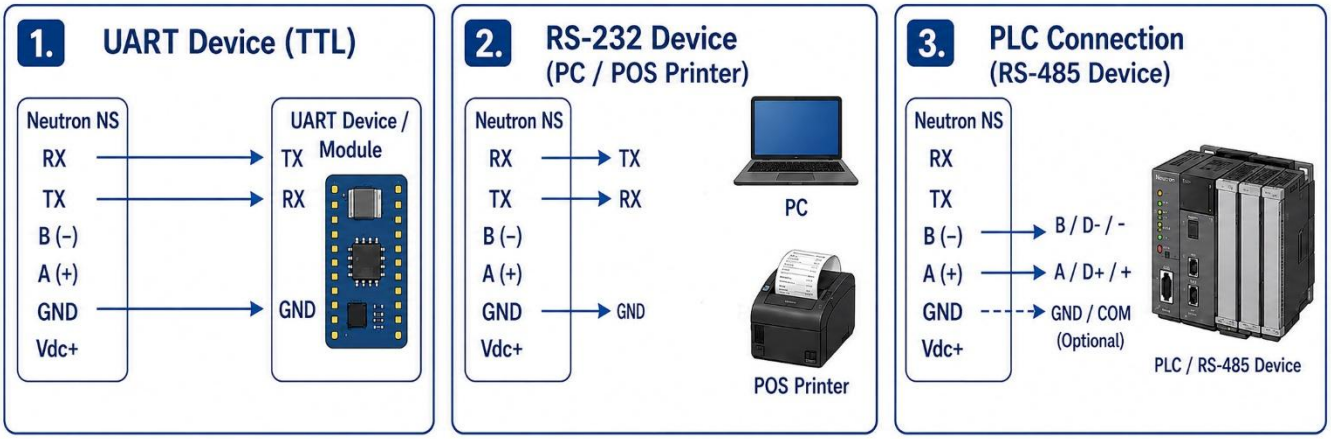
4) Ethernet Interface

E	Ethernet

Serial connection scheme

Neutron NT is equipped with a screw terminal block for power supply and serial communication. It supports typical UART, RS-232 and RS-485 wiring configurations.

UART is mainly intended for direct MCU/PCB integration, RS-232 for connection to PCs, POS printers or label printers, and RS-485 for PLCs and other industrial devices.



The terminal block provides connections for power and serial communication and supports typical **UART / RS-232 / RS-485** wiring configurations.

Terminal	Function	Description
RX	Serial receive	Data input to Neutron
TX	Serial transmit	Data output from Neutron
B (-)	RS-485 B / negative line	Differential RS-485 bus line
A (+)	RS-485 A / positive line	Differential RS-485 bus line
GND	Signal ground	Common reference ground
Vdc+	Power input	Positive DC supply input, 5-24Vdc

Typical wiring examples for UART, RS-232 and RS-485 devices:

Please see manual for complete connection instructions.

Dimensions in mm