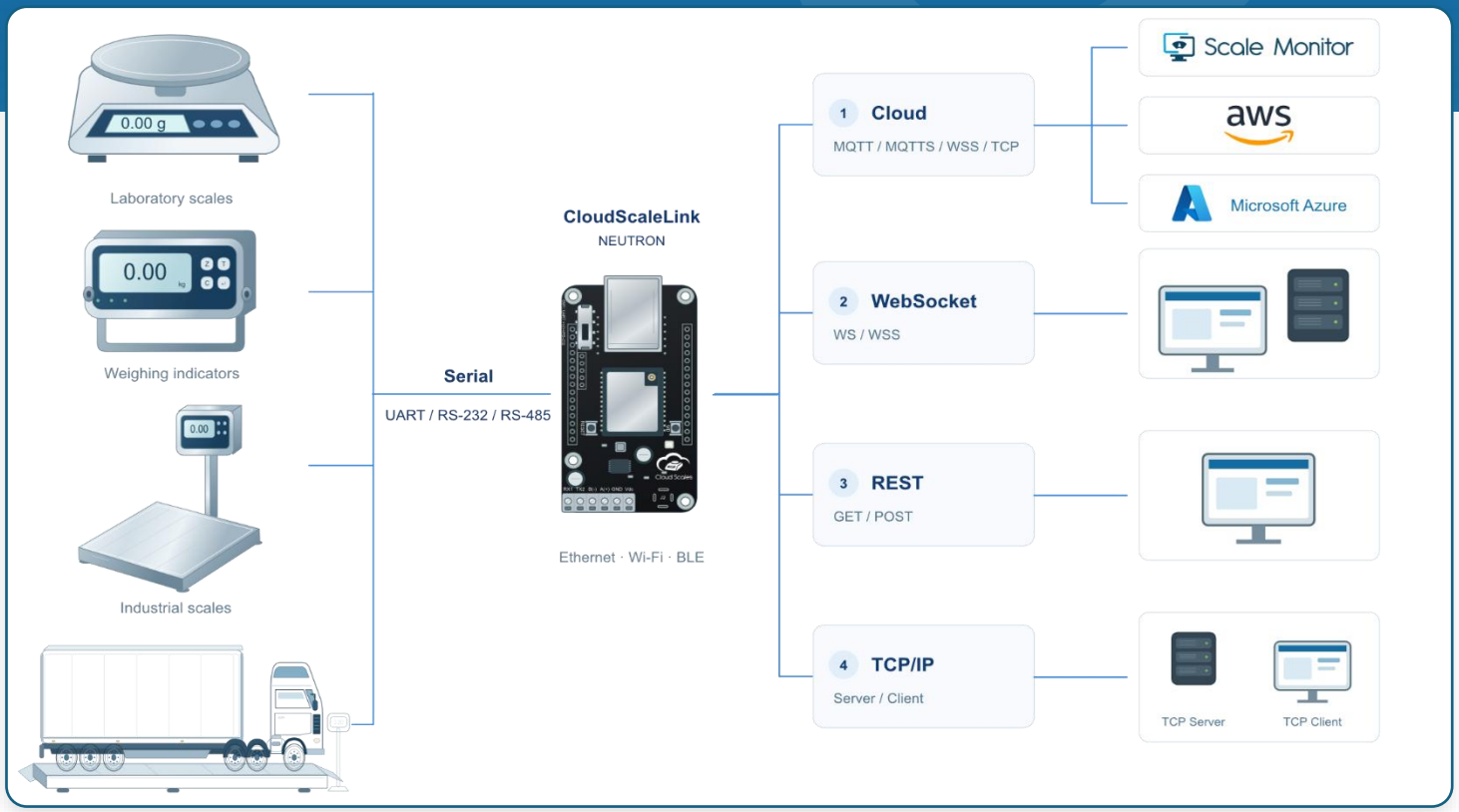
NEUTRON

CloudScaleLink

Hybrid IoT module for scales, cloud integration and local weighing intelligence

- Connect existing & new scales
- Standardize weighing data
- Integrate with cloud, ERP, MES and IoT/IIoT



Product overview

CSL Neutron is a compact hybrid IIoT module designed to connect weighing systems to modern software environments. It enables communication between scales and cloud platforms while supporting local processing, protocol handling and integration logic.

The module is especially useful when existing weighing equipment must be digitalized without replacing the complete scale. Neutron can also be integrated into new scales or OEM weighing systems where reliable cloud connectivity and standardized data exchange are required.

Key benefits

- Cloud-ready upgrade for new and existing scales
- Supports UART, RS-232 and RS-485 scale interfaces
- Ethernet, Wi-Fi and Bluetooth BLE connectivity options
- Suitable for Scale Monitor and custom cloud applications
- Reduces dependency on legacy local software
- Remote configuration and support friendly architecture

Typical use cases

- Digitalization of installed scales in production or laboratories
- Connecting mixed scale fleets from different manufacturers
- Scale data collection and traceability
- Remote monitoring and cloud dashboards
- ERP, MES, WMS and quality system integration
- OEM modules for new weighing equipment

Main functions

Scale connectivity	Cloud communication	Local intelligence
Serial communication with scales using UART, RS-232 or RS-485 interfaces.	Connection to Scale Monitor and other cloud, web or server-based applications.	Local parsing, protocol handling and command processing for weighing data.
Suitable for many scale brands and legacy weighing indicators.	Two-way communication for sending data and receiving commands.	Designed for integration scenarios where response time and reliability matter.
Can be used to standardize different scale protocols.	Supports cloud dashboards, ERP, MES, WMS and IoT workflows.	Enables one consistent integration layer for existing and new weighing systems.

Why Neutron?

Many companies operate weighing equipment from different manufacturers and different generations. Replacing all scales is often expensive and unnecessary. Neutron provides a practical way to upgrade existing scales and connect new scales to the same digital platform.

For existing scales

- Keep proven weighing hardware in operation
- Add cloud connectivity without replacing the scale
- Unify data from older and newer indicators
- Reduce manual data entry and transcription errors

For new systems

- Add ready-to-integrate communication layer
- Support modern cloud-based workflows
- Prepare weighing devices for remote service and diagnostics
- Build scalable solutions for multiple sites and customers

Smart Integration Possibilities

The CSL Neutron is ideal for:

- Scale Monitor cloud platform
- custom software applications
- cloud dashboards and remote monitoring
- data collection and traceability
- integration with ERP, MES, and IoT systems
- service and maintenance applications

Supported manufacturers

Neutron is suitable for mixed weighing environments where different scale manufacturers, protocols and communication standards must be unified into one software architecture.

Officialy supported and tested scales from

- Mettler Toledo
- Sartorius / Minebea Intec
- A&D
- Ohaus
- Avery Weigh-Tronix
- Radwag
- Rice Lake
- Dini Argeo
- Kern & Sohn
- Ravas
- Precisa
- Systec
- Brecknell
- KPZ

If your scale manufacturer is not on the list it does not mean scale will not work with Neutron. It means just that we have not yet tested connection with scale of the manufacturer. Neutron is compatible with any device that has UART, RS-232 or RS-485 serial output. If you are unsure, if your scale has serial output contact us and we will check it for you.

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 Solutions for Scale Manufacturers

Neutron is also available as an OEM integration platform for scale manufacturers who want to add modern connectivity and cloud support to their existing weighing products. Instead of developing a new IoT gateway, cloud interface, firmware layer, management platform, and security architecture from scratch, manufacturers can integrate Neutron directly into their own scales, indicators, terminals, or weighing systems.

CloudScaleLink can support OEM customers with **custom PCB design**, **private label versions**, **custom firmware**, and **branded cloud solutions** for managing connected interfaces and scales. This allows manufacturers to offer a complete digitalization package under their own brand, while reducing development time, project risk, and engineering cost.

Custom PCB	Private label	Custom firmware
Neutron-based hardware adapted to the manufacturer's device, enclosure, connector, or installation requirements.	Product branding adapted to the manufacturer's own product family.	Dedicated firmware behavior, 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 serial commands, data formats, and weighing workflows.

Result for manufacturers: faster time to market, lower development cost, reduced technical risk, and a practical way to add cloud connectivity to existing scales without redesigning the complete weighing system.

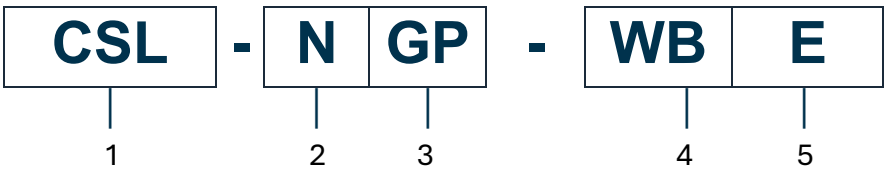
Technical specifications

General	Description
Product name	CloudScaleLink Neutron / CSL Neutron
Product type	Hybrid IoT communication module for weighing systems and serial devices
Primary function	Connect serial devices such as scales to cloud platforms, local networks and business software
Scale interfaces	UART, RS-232, RS-485 depending on hardware configuration
Network interfaces	Wi-Fi, Bluetooth BLE and optional Ethernet depending on version
Cloud integration	Scale Monitor, AWS, Azure, local cloud platforms, 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
Installation	OEM integration or external connection to existing scales
Application area	Industrial weighing, laboratories, logistics, production, service and maintenance
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

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
Supply & environment	
Power supply	5~24 Vdc ± 5%
Connector	Terminal block or male connector for adapter (see product list).
Temperature range	-10 ~ +40 °C
Humidity	Max 85% non-condensing
Dimensions (PCB only)	
CSL-NGP-WB	71x40x13 mm (LxWxH); Wi-Fi & Bluetooth
CSL-NGP-WBE	74x40x22 mm (LxWxH); Wi-Fi, Bluetooth & Ethernet

Ordering information

CloudScaleLink modules have the following product code structure:



1) Product family

CSL	CloudScaleLink family

2) Model family

N	Neutron

3) Version / application type

GP	General purpose edition for OEM integration without any cable
LE	General purpose edition for integration with loose end cables – length 15 cm
DA	General purpose edition for integration with AMP connector for connecting to Dini Argeo indicators – cable length 15 cm
OH	General purpose edition for integration with connector for connecting to Ohaus indicators – cable length 15 cm
OS	Module in housing with PS2 connector for connecting with Ohaus SKX and STX scales – cable length 15 cm
HF	Module in housing with RS232 cable with female connector – cable length 30 cm. Compatible with scales that have male DB9 connector.
HM	Module in housing with RS232 cable with male connector – cable length 30 cm. Compatible with scales that have female DB9 connector.

4) Wi-Fi/Bluetooth Interface

WB	Wi-Fi & Bluetooth

5) Ethernet Interface

E	Ethernet

Available standard models

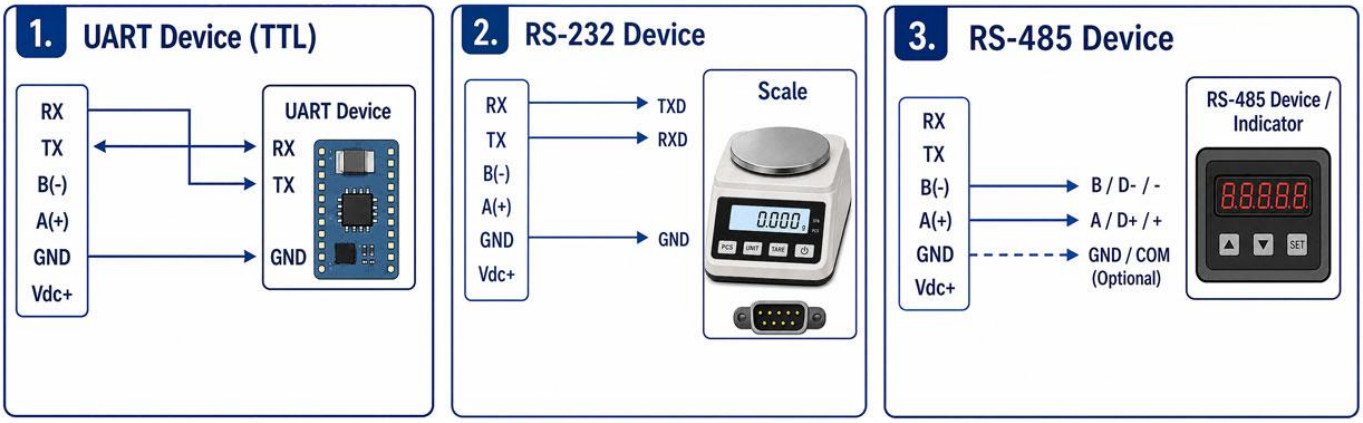
Models with Wi-Fi / Bluetooth	Models with Ethernet and Wi-Fi / Bluetooth
CSL-NGP-WB	CSL-NGP-WBE
CSL-NLE-WB	CSL-NLE-WBE
CSL-NDA-WB	CSL-NDA-WBE
CSL-NOH-WB	CSL-NOH-WBE
CSL-NOS-WB	CSL-NOS-WBE
CSL-NHF-WB	CSL-NHF-WBE
CSL-NHM-WB	CSL-NHM-WBE

Connection scheme

Neutron is supplied with a screw terminal block for connection to a scale, balance, indicator, or other serial device. The terminal block provides connections for power and serial communication and supports typical **UART / RS-232 / RS-485** wiring configurations, depending on the selected Neutron version and UART/RS-232 switch setting.

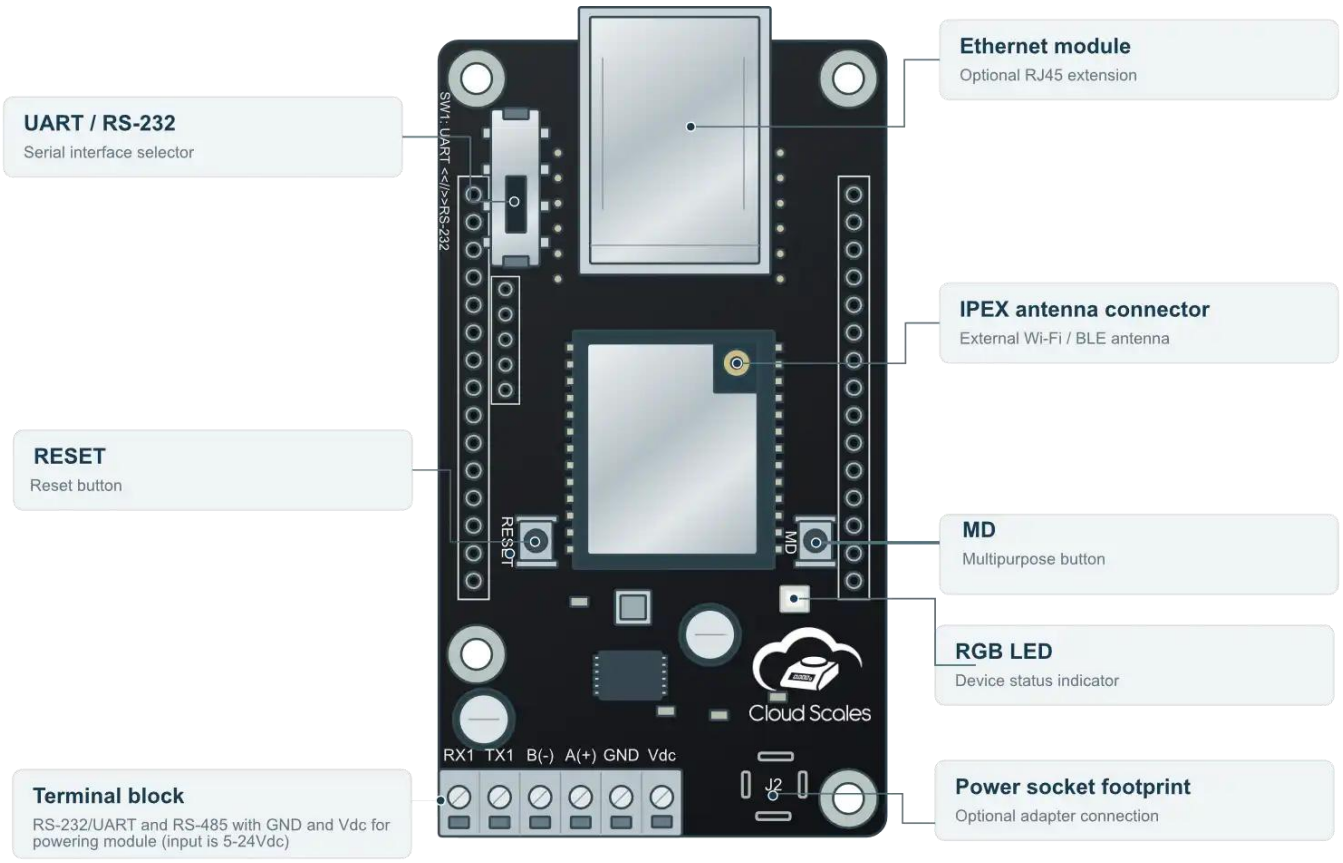
Terminal	Function	Description
RX	Serial receive	Data input to Neutron
TX	Serial transmit	Data output from Neutron
B(-)	RS-485 B / negative line	Differential RS-485 bus line
A(+)	RS-485 A / positive line	Differential RS-485 bus line
GND	Signal ground	Common reference ground
Vdc+	Power input	Positive DC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

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



Please see manual for complete connection instructions.

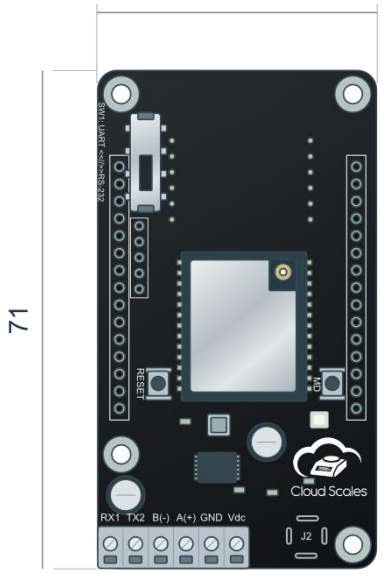
PCB overview



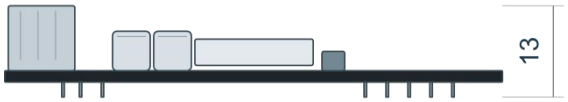
Dimensions in mm

CSL-NGP-WB

Wi-Fi / Bluetooth BLE



TOP VIEW

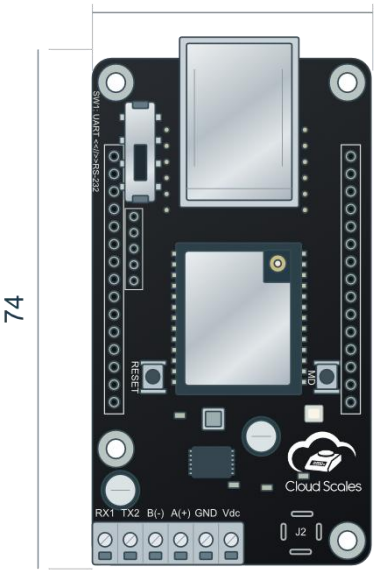


SIDE VIEW

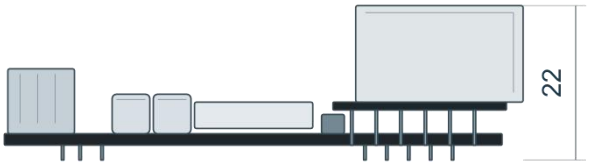
71 × 40 × 13 mm

CSL-NGP-WBE

Ethernet / Wi-Fi / Bluetooth BLE



TOP VIEW



SIDE VIEW

74 × 40 × 22 mm