

LinkEdge

LE-100 Series

Multi-protocol industrial edge gateway with autonomous device discovery

Features and Benefits

- Autonomous protocol detection — self-configures on connection
- 25 industrial protocol connectors included as standard
- 2 × Gigabit Ethernet for isolated plant-LAN and uplink segments
- 4 × isolated RS-485, 1 × isolated RS-232, 1 × isolated CAN-FD
- 4 × isolated 24 V digital inputs, 4 × relay outputs
- 2,500 tags at 200 ms scan with zero missed deadlines
- Edge filtering, aggregation and threshold evaluation
- Store-and-forward buffering through uplink outages
- Hardware secure element for per-device identity
- Fan-less, 9–36 VDC, wall or DIN-rail mounting

Introduction

The LinkEdge LE-100 Series connects legacy and modern production assets to enterprise, analytics and digital-twin applications without machine-side engineering. On connection the gateway identifies the protocol spoken on the port, enumerates the available data and begins publishing normalised telemetry, removing the per-machine integration effort that dominates conventional industrial IoT rollouts.

Acquired data is normalised into a single tag model, processed locally and routed concurrently to multiple destinations — the Link360 platform, existing SCADA and MES systems, or any MQTT broker or REST endpoint. Each connected device is serviced by an independent scan loop, so a slow or failed device cannot stall acquisition from the rest of the plant.

Autonomous protocol detection — Indian patent application 202541089083.

Specifications

Computer

CPU	Quad-core 64-bit ARM Cortex-A72, 1.5 GHz
Memory	4 GB LPDDR4
Storage	32 GB eMMC, industrial grade
Operating system	Linux, 64-bit
Real-time clock	Battery-backed, temperature-compensated, ±2 ppm
Watchdog	Independent hardware supervisor, forced reset on userland hang

Protocol Support

Industrial Ethernet	Modbus TCP · OPC UA · EtherNet/IP · PROFINET · and more
PLC native	Siemens S7 · Mitsubishi MELSEC · Omron FINS · Beckhoff ADS · and more
Serial	Modbus RTU · Modbus ASCII · generic RS-485 / RS-232 · and more
Fieldbus and vehicle	CANopen · SAE J1939 · and more
Machine tool	MTConnect · Atlas Copco Open Protocol · and more
Building and network	BACnet/IP · KNX/IP · SNMP v1 / v2c / v3 · and more
Utility and SCADA	DNP3 · IEC 60870-5-104 · M-Bus · and more
IoT and data	MQTT · HTTP/REST · WebSocket · BLE GATT · SQL databases · I ² C · and more
Expansion	Custom, legacy and vendor-specific connectors developed to order

Standard build ships with 25 protocol connectors. The list is representative rather than exhaustive — protocol coverage is agreed per deployment and modified to suit customer equipment and requirements. Availability on a given unit depends on the physical interface required.

Software Features

Device discovery	Network sweep, active protocol probing, vendor fingerprinting, confidence-ranked results
Tag discovery	Automatic tag enumeration for self-describing protocols

Data normalisation	Integer, float, string, boolean and multi-word types; selectable word and byte order
Edge processing	Deadband filtering, change-of-value reporting, aggregation, threshold events
Routing	Configurable topic templates, payload formatting, concurrent multi-destination fan-out
Buffering	Local store-and-forward through broker or link outage, automatic drain on reconnect
Configuration	Versioned and validated on load, restorable to any previous snapshot
Diagnostics	Per-connection state, error counters, reconnect history, gateway resource metrics
Recovery	Automatic reconnection with exponential backoff; watchdog-supervised process restart

Performance

Concurrent device connections	25 validated; higher counts configurable
Configured tags	2,500 validated across all connections
Minimum scan interval	50 ms per connection, independently configurable
Sustained tag throughput	12,400 tag-reads/s
Scan deadline adherence	100 % at full rated load
Scan jitter	< 15 ms (95th percentile) at full rated load
Single-tag read latency	0.33 ms mean, 0.45 ms (95th percentile)
Acquisition cycle time	8.5 ms mean, 23.8 ms (95th percentile), 100-tag batched read
Protocol conversion latency	< 0.1 ms per tag, excluding network time
MQTT publish rate	12,400 msg/s sustained; 88,000 msg/s peak
Buffer drain rate	> 60,000 msg/s on reconnection
CPU utilisation at rated load	< 35 % of one core
Memory footprint	< 64 MB, stable across sustained operation

Measured on the August 2026 software build, constrained to a single CPU core, against 25 concurrent Modbus TCP devices and a local MQTT broker. Figures are a conservative floor for the four-core gateway. Achievable rates in the field depend on device response time, network conditions and the protocols in use.

Ethernet Interface

Ports	2 × RJ45, 10/100/1000BASE-T
Topology	Independent WAN and plant-LAN segments
Auto MDI/MDI-X	Supported
Magnetic isolation	1.5 kV, built in

Serial Interface

RS-485 ports	4 × 2-wire, pluggable terminal block, 3.5 mm pitch
RS-485 signals	A, B, isolated GND, cable-shield drain, termination
RS-232 port	1 × DB9 male
RS-232 signals	TxD, RxD, GND
Isolation	5 kV _{rms} galvanic, per port
Termination	120 Ω, jumper-selectable per RS-485 port
Nodes per RS-485 port	Up to 32

Serial Communication Parameters

Baud rate	50 bps to 921.6 kbps
Data bits	5, 6, 7, 8
Stop bits	1, 1.5, 2
Parity	None, Even, Odd, Mark, Space
Flow control	None, RTS/CTS, XON/XOFF
RS-485 direction control	Automatic (ADDC)

CAN Interface

Ports	1 × CAN / CAN-FD, pluggable terminal block, 3.5 mm pitch
Signals	CAN_H, CAN_L, isolated GND
Standard	ISO 11898

Isolation	5 kV _{rms} galvanic
Termination	120 Ω, jumper-selectable

Digital Input

Channels	4, optically isolated
Input type	24 V sinking, industrial sensor compatible
Protection	Series current limiting and transient voltage suppression per channel
Isolation	5 kV _{rms} galvanic

Digital Output

Channels	4, relay, dry contact
Contact type	SPDT
Contact rating	2 A @ 30 VDC
Isolation	Optically isolated drive, galvanically isolated contacts

Wireless Interface

WLAN	IEEE 802.11 b/g/n/ac
Bluetooth	Bluetooth 5.0 / BLE
Cellular	4G LTE Cat-4, global bands, MIMO (LE-100-L and LE-100-LX only)
SIM	Nano-SIM (4FF), externally accessible
Antennas	2 × SMA for cellular; internal antenna for WLAN, external optional

Security

Device identity	Hardware secure element, per-device private key, non-extractable
Transport	Encrypted uplink; certificate-based authentication where the protocol supports it
Credentials	Stored encrypted; never held in plain configuration files
Access control	User authentication with role-based permissions
Network	Segmentation between plant LAN and uplink interface
Audit	Logging of configuration changes

Power Parameters

Input voltage	9 to 36 VDC
Input current	210 mA @ 24 VDC typical; 375 mA @ 24 VDC maximum
Power consumption	5 W typical, 9 W maximum
Connector	2-pin pluggable terminal block, 3.5 mm pitch
Protection	Reverse polarity, resettable over-current, transient voltage suppression
Power over Ethernet	IEEE 802.3at (factory option)

Physical Characteristics

Housing	ABS, fan-less
Dimensions	120 × 100 × 35 mm (W × D × H); 140 mm across mounting flanges
Weight	280 g
Installation	Wall or panel mount via integral flanges; DIN rail via LE-ACC-DIN
Ingress protection	IP20
Indicators	Power, uplink and network status
Controls	Reset and Boot buttons
Expansion	Modular sensor and I/O expansion header

Environmental Limits

Operating temperature	0 to 60 °C (LE-100, LE-100-L) · -25 to 75 °C (LE-100-X, LE-100-LX)
Storage temperature	-40 to 85 °C (target)
Ambient relative humidity	5 to 95 %, non-condensing (target)

Operating altitude	Up to 2,000 m (target)
Vibration	IEC 60068-2-6 (target — qualification pending)
Shock	IEC 60068-2-27 (target — qualification pending)

Standards and Certifications

EMC — emissions	EN 55032 Class B · FCC Part 15 Subpart B Class B (design target)
EMC — immunity	EN 55035 · EN 61000-6-2 · IEC 61000-4-2 (±8 kV contact, ±15 kV air), -4-3, -4-4, -4-5, -4-6, -4-8 (design target)
Safety	EN 62368-1 (design target)
Environmental	RoHS 3 (2011/65/EU and 2015/863) · REACH (EC 1907/2006) — self-declared, Declaration of Conformity available
India	BIS registration planned

Entries marked "design target" define the qualification programme for the LE-100 Series. Formal test reports and certificates will be issued on completion; contact Calypson for current certification status before specifying for a regulated installation.

MTBF

LE-100, LE-100-X	850,000 hours
LE-100-L, LE-100-LX	725,000 hours
Standard	Telcordia SR-332 Issue 3, Method I (parts count)
Conditions	Ground fixed and controlled, 40 °C ambient, 50 % electrical stress, quality level II

Calculated reliability prediction. Not demonstrated by life test. Excludes the real-time clock backup cell, which is a scheduled-replacement consumable, and external antennas and cabling.

Warranty

Warranty period	3 years
Details	See the warranty policy issued with the product

Warranty term is provisional pending commercial sign-off.

Package Contents

- 1 × LinkEdge LE-100 Series gateway
- 1 × DC power terminal plug, 2-pin
- 4 × RS-485 terminal plugs, 5-pin
- 1 × CAN terminal plug, 3-pin
- 1 × digital I/O terminal plug, 10-pin
- 2 × LTE antennas (LTE models only)
- 1 × quick installation guide
- 1 × warranty card

Ordering Information

Model	Configuration	Notes
LE-100	Base gateway	2 × GbE, 4 × RS-485, RS-232, CAN-FD, 4 DI / 4 DO, Wi-Fi, 0 to 60 °C
LE-100-L	Base plus 4G LTE Cat-4	For sites without a wired uplink
LE-100-X	Base plus extended temperature	–25 to 75 °C operating range
LE-100-LX	LTE plus extended temperature	Full-option configuration

Accessories (sold separately)

Model	Description	Notes
LE-ACC-DIN	DIN-rail mounting adapter	35 mm top-hat rail
LE-ACC-ANT	External LTE / Wi-Fi antenna kit	2 × SMA cellular, 1 × RP-SMA WLAN
LE-ACC-PSU	DIN-rail power supply, 24 VDC	For panel installation

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