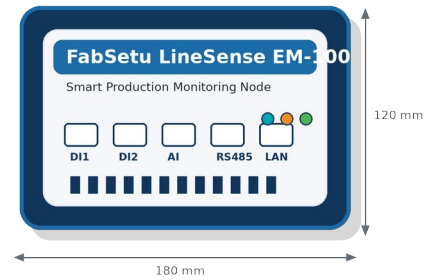


# LineSense EM-100

## Smart Production Monitoring Node for Electronics Manufacturing Lines

A compact industrial edge device designed to capture equipment signals, machine events, sensor readings and operator inputs from SMT, PCB assembly, testing and packing lines. EM-100 converts shop-floor activity into structured production data for dashboards, alerts and MES/ERP integration.



|         |                 |                  |           |
|---------|-----------------|------------------|-----------|
| 24 V DC | RS-485 / Modbus | Ethernet / Wi-Fi | MES Ready |
|---------|-----------------|------------------|-----------|

### Designed for real-time visibility in electronics manufacturing

The EM-100 reduces manual production reporting by connecting shop-floor signals to a secure data pipeline. It can be deployed as a line-level node, equipment-side gateway or test-station event logger. Typical use cases include cycle-count capture, downtime tagging, yield traceability and bottleneck identification.

#### Product status

Concept datasheet / preliminary release. Final electrical and compliance values must be validated during engineering qualification.

#### AT A GLANCE

|   |   |  |
|---|---|--|
| <b>Line Connectivity</b><br>Digital inputs, analog input and RS-485 interface for machines, counters, sensors and PLCs. | <b>Edge Intelligence</b><br>Local buffering and event normalization for stable operations during network interruptions. | <b>Part number</b><br>FS-LS-EM100        |
| <b>Fast Deployment</b><br>DIN-rail friendly enclosure, 24 V DC input and configuration through a secure web console.    | <b>Data Integration</b><br>REST API and MQTT publishing for MES, ERP, dashboards and factory analytics systems.         | <b>Form factor</b><br>DIN-rail / panel   |
|   |   | <b>Inputs</b><br>8 DI, 2 AI              |
|   |   | <b>Interfaces</b><br>LAN, Wi-Fi, RS-485  |
|   |   | <b>Supply</b><br>24 V DC nominal         |
|   |   | <b>Use case</b><br>Production visibility |

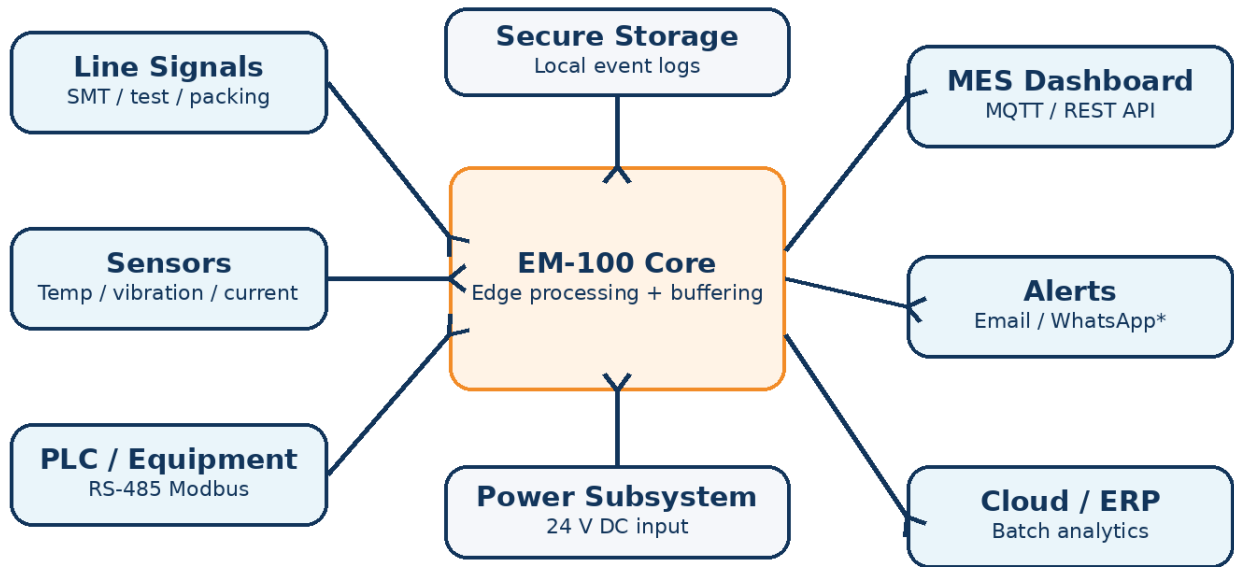
|   |  |   |
|---|--|---|
| <b>Applications</b> <ul style="list-style-type: none"> <li>SMT line OEE capture</li> <li>PCB test-station logging</li> <li>Downtime and changeover tracking</li> <li>Assembly and packing counters</li> </ul> | <b>Business value</b> <ul style="list-style-type: none"> <li>Reduces manual reporting effort</li> <li>Improves traceability readiness</li> <li>Supports faster root-cause analysis</li> <li>Enables line-level KPI dashboards</li> </ul> | <b>Ideal users</b> <ul style="list-style-type: none"> <li>EMS operations teams</li> <li>OEM production teams</li> <li>Quality and process engineers</li> <li>Digital factory integrators</li> </ul> |
|---|--|---|

## TECHNICAL SPECIFICATIONS

| Category                       | Parameter             | Specification  |
|--------------------------------|-----------------------|--|
| <b>Processor &amp; storage</b> | Application processor | ARM Cortex-A class SoC, edge event processing, secure boot capable             |
|                                | Memory                | 1 GB RAM, 8 GB eMMC for configuration, local queueing and logs                 |
| <b>Inputs / outputs</b>        | Digital inputs        | 8 isolated digital inputs, 24 V industrial signal compatible                   |
|                                | Analog inputs         | 2 configurable analog channels for sensor monitoring                           |
|                                | Relay output          | 1 relay output for tower-light, buzzer or interlock signaling                  |
| <b>Communication</b>           | Ethernet              | 10/100 Mbps RJ45 LAN with static/DHCP addressing                               |
|                                | Wi-Fi                 | 2.4 GHz Wi-Fi for non-critical telemetry and configuration access              |
|                                | Serial interface      | RS-485, Modbus RTU master/client deployment mode                               |
| <b>Software</b>                | Protocols             | MQTT, REST API, CSV export and local configuration web UI                      |
|                                | Data model            | Event timestamping, line/station mapping, shift and batch fields               |
| <b>Power</b>                   | Supply input          | 24 V DC nominal; reverse polarity and transient protection recommended         |
| <b>Mechanical</b>              | Mounting              | DIN-rail clip or panel mounting bracket  |
|                                | Dimensions            | Approx. 180 mm x 120 mm x 42 mm; final enclosure subject to tooling            |
| <b>Environment</b>             | Operating temperature | 0 °C to 55 °C typical indoor industrial environment                            |
|                                | Humidity              | 10% to 90% RH, non-condensing  |
| <b>Compliance target</b>       | EMC / safety          | Designed for CE/UKCA-ready architecture; certification depends on final design |

Note: Specifications are proposed values for a new-product datasheet. Electrical ratings, environmental limits and compliance statements must be confirmed after validation, safety review and certification testing.

**FUNCTIONAL BLOCK DIAGRAM**



\* Messaging connector is optional and depends on deployment configuration.

| Capture layer  | Edge layer   | Publish layer  |
|--|--|--|
| Digital inputs, analog channels and RS-485 bring equipment status and process signals into the EM-100. | Timestamping, event normalization, local buffering and basic rules operate close to the production line. | MQTT, REST API and CSV exports deliver structured events to dashboards, MES, ERP or analytics tools. |

## DEPLOYMENT ARCHITECTURE

### 1. Capture

Connect digital pulses, machine ready/fault status, counter signals, operator station events or Modbus data from line equipment. Configure mapping per line, station and product family.

### 2. Normalize

Convert raw signals into production events such as cycle complete, downtime start/stop, reject count, test pass/fail or changeover. Store temporarily when the network is unavailable.

### 3. Publish

Send structured data through MQTT or REST API to dashboards, MES, ERP, data lake or custom factory analytics solutions.

### Recommended implementation workflow

**Site survey:** Identify machines, available signals, station ownership and network constraints.

**Pilot line:** Deploy 1-2 nodes on a representative SMT or assembly line and validate the event model.

**Dashboard:** Create OEE, downtime, throughput and yield views for supervisors and process engineers.

**Scale-up:** Standardize wiring, device naming, data governance and maintenance procedures across lines.

## ORDERING INFORMATION

| Model          | Description                     | Included interfaces                             | Recommended use                           |
|----------------|---------------------------------|---|---|
| FS-LS-EM100-B  | Base production monitoring node | 8 DI, 2 AI, LAN                                 | Pilot lines and line counters             |
| FS-LS-EM100-M  | Manufacturing integration model | 8 DI, 2 AI, LAN, RS-485                         | SMT/test equipment integration            |
| FS-LS-EM100-W  | Wireless-enabled model          | 8 DI, 2 AI, LAN, Wi-Fi                          | Retrofitting where cable runs are limited |
| FS-LS-EM100-DK | Developer kit                   | Device, power adapter, demo sensors, sample API | Integrator evaluation and PoC             |

## QUALITY, COMPLIANCE AND SERVICE NOTES

| Manufacturing quality   | Compliance target   | Serviceability  |
|---|---|---|
| Recommended controls include incoming inspection, automated PCB inspection, in-circuit test, functional test, firmware version control and serialized traceability. | Final product design should be reviewed for EMC, safety, ESD, RoHS and regional market requirements before release to production. | Provide spare terminal blocks, configuration backup, firmware update process and line-level installation documentation for maintenance teams. |

**For product customization, integration planning or pilot deployment, contact FabSetu product engineering.**

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