

Overview

The **Electrical 16-channel Node** is an energy meter, power quality monitor and spectrum analyser. Simultaneous monitoring of up to 16 circuits across 1/3 voltage phases. Real time, time-synchronous data at 1 second intervals.

Plug-and-play installation with clamp-on sensors. Built-in wireless connectivity over Wi-Fi, Linc Mesh or cellular LTE (optional).

Suited for industrial, commercial, residential and grid applications.



Data Reporting

Voltage

Physical connection (1/3 phase. Y:L-N):

- Wired, clamp or magnetic connections for L1, L2, L3 and N.
- Associate any voltage phase to any current input channel.
- 3-phase voltage and neutral inputs individually calibrated to $\pm 0.2\%$.

Parameters:

- RMS (L1: 100-277V, L2/L3: 0-277V)
- Waveform peak (V_{peak})
- Crest Factor
- Harmonic Distortion (THDf, THDr)
- Spectrum (1 Hz granularity for all inter/harmonic values up to 2048 Hz).

Line Frequency

- L1 frequency (45-67 Hz)
- Transient statistics (every 10 AC cycles):
 - Min / Max
 - Standard deviation

Current

Sensors (up to 16 circuits):

- Clamp-on current transformers (up to 400A, $\pm 0.5\%$ accuracy).
- Flexible Rogowski Coils (up to 5000A, $\pm 0.5\%$ accuracy). Direct connection, no need for integrator or power supply.
- All 16 current inputs individually calibrated to $\pm 0.2\%$.

Parameters:

- RMS (up to 5000A)
- Waveform peak (A_{peak})
- Crest Factor
- Harmonic Distortion (THDf, THDr)
- Spectrum (1 Hz granularity for all inter/harmonic values up to 2048 Hz).

Energy

- Independent metering of imported and exported energy (Wh).
- Metering functionality continues even if the network is offline.
- Accuracy: Class 1.0

Network

- Signal quality metrics (dBm):
 - RSSI (Rel. Signal Strength Indicator)
 - RSRP (Ref. Signal Received Power)
 - RSRQ (Ref. Signal Received Quality)
 - SINR (Signal to Interference plus Noise Ratio)

Power

- Individual power monitoring for every current channel and associated phase.
 - Active Power (W)
 - Reactive Power (var)
 - Apparent Power (VA)
 - Power Factor

Communications

Connectivity

- Integrated wireless modules:
 - **Wi-Fi**: Standard 2.4 GHz network.
 - **Linc Mesh**: Self-organising network for in-building connectivity between Linc nodes sharing data or internet.
 - **Cellular** (optional): LTE-M (Cat-M1) and NB-IoT (Cat-NB2) support with insertion of a standard SIM card.
- Typical >99% network uptime.
- End-to-end data encryption over TLS.

Data Handling

- Real time (sub-second) data delivery.
- Time synchronisation with NTP server every 10 mins. All Linc nodes within 1s.
- Configurable reporting intervals (1/60s).
- Selectable parameters to suit use-case. Optional min/max for 60s intervals.
- Flexible data handling modes: **Platform** (storage, visuals, alerts and analytics), **Relay** (MQTTs transfer), or **Local** (on-site access).

Installation

Mounting

- Direct mount on DIN rail (IEC 60715)
- Wall mount (hole separation: 108mm)

Current sensors

- Clamp sensors on to individual current-carrying wires or bus-bars.
- Arrow marking on Current Transformer (CT) and Rogowski Coil (RC) indicates positive current flow towards load.
- Built-in RC support. No additional integrator or power supply needed.

Power supply and voltage sensing

On-site configuration of Linc node:

1. Wait for the node to complete booting up (blinking magenta).
2. Press setup button. LED will blink green while in setup mode.
3. Connect your mobile device to the node over Wi-Fi (Linc_ _ _ _).
4. Browse to **http://linc.home**
5. Follow on-screen steps to configure.

Remote configuration

- Full support for remote configuration.
- Over-the-Air (OTA) firmware updates.

Power supply and voltage sensing

- Connect voltage (L1) and neutral (N) to supply power to the Linc node.
 - 100-277V at 50/60Hz
 - Peak draw: 3W
 - Nominal draw: 1.5W
- For poly-phase sensing, connect L2/L3.
- Available clamp and magnetic contacts.

LED states

- Breathing pattern: Normal operation.
 - **Blue**: Connected to server.
 - **Orange**: Connected to local host.
- Blinking pattern: System process.
 - **Green**: Setup mode active.
 - **White**: Scanning for network.
 - **Red**: Waiting for internet access.
 - **Magenta**: Booting up.
 - **Yellow**: Downloading firmware.

Compliance

Operational Environment

- Temperature range:
 - From -40°C to +80°C.
- Humidity range:
 - From 0% to 95%, non condensing.
- Ingress protection:
 - IP X0 (IEC 60529)
- Altitude:
 - Up to 4000m

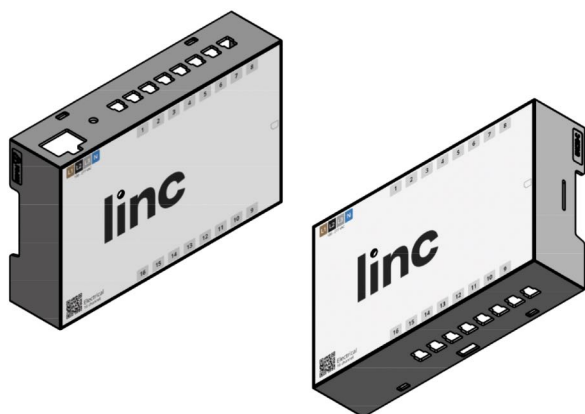
Certifications

- CE Marking
 - EMC: EN 301489-1, EN 301489-17, EN 61326-1, FCC 15B/2015, ICES-003 Issue 6/2016
 - RED: EN 300328
 - RF: EN 62311
 - Safety: EN 61010-1, EN 62368-1
 - RoHS: 2011/65/EU

Mechanical

Enclosure

- Dimensions: 142 x 90 x 32 mm
- Weight: 170g (180g with LTE)
- Material: Self extinguishing Blend PC/ABS



Schematic

