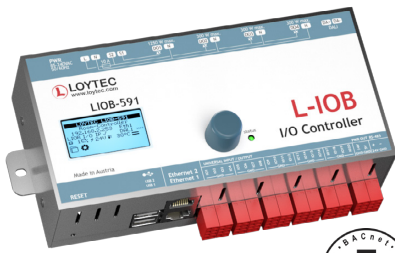


- ✓ BACnet
- ✓ DALI
- ✓ OPC

- ✓ Modbus



Datasheet #89072125



The LIOB-591 fan coil controller provides the basis for a revolutionary room automation system based on IP, which seamlessly integrates with native BACnet/IP networks at the controller level. Together with the L-STUDIO software, room control solutions can be created with little effort. Integral parts of the room control system are a web-based room operation via an LWEB-802/803 dashboard and the automatic generation of graphics for the L-PAD / L-VIS Touch Panel for local operation. LIOB-591 Controllers implement the BACnet Building Controller (B-BC) profile and are BTL certified.

Our room controllers provide all common interfaces and a large number of physical I/Os for room automation projects. DALI lamps and DALI sensors are connected to the DALI interface with an integrated DALI power supply. Up to 16 SMI sunblind motors connect to an external SMI interface. Belimo valves connect to the external MP-Bus interface. BACnet MS/TP devices connect to the RS-485 interface, which can also be configured as a Modbus RTU interface to connect Modbus devices like energy meters or ekey finger scanners for access control or to connect the L-STAT room operator panel. EnOcean devices connect to the external EnOcean interface. Dual Ethernet ports allow daisy chaining of LIOB-591 controllers in a ring topology and provide BACnet/IP, Modbus/IP and OPC communication.

Optionally the LIOB-591 can communicate via wireless LAN through the LWLAN-800 wireless adapter connected to the USB port. 20 universal I/Os, one 1250 W and three 300 W TRIAC outputs connect various physical input and output devices. Our room automation library provides pre-built function modules for all lighting, heating, cooling, ventilation, sunblinds and access control via finger scanners. Built-in TSL encryption ensures secure operation of the room automation system.

All typical room functions are supported:

- Lighting control with constant light controller
- Sunblind control with angle adjustment and year shade progression
- Temperature control for heating, cooling, and ventilation
- Occupancy detection
- Window monitoring and window contact

Features

- Room controller for 1 room segment
- Networking via redundant IP network
- Programmable with L-STUDIO (IEC 61131-3 or IEC 61499)
- Extension with physical inputs and outputs using L-IOB I/O Modules (LIOB-45x or LIOB-55x/56x)
- 128x64 graphic display with backlight for device configuration and maintenance
- Local display of device and data point information
- Manual operation using the jog dial or VNC Client
- Integrated AST™ functions (Alarming, Scheduling, and Trending) for each room segment
- Node.js support¹ for easy IoT integration (e.g. Google calendar, MQTT, Alexa & friends, multimedia equipment,...)
- Event-driven e-mail notification
- Math objects to execute mathematical operations on data points
- Stores customized graphic pages
- Visualization of customized graphic pages through LWEB-900 (Building Management), LWEB-803 (Monitoring and Control), or LWEB-802 (Web Browser)
- Support of the L-STAT Room Operator Panel
- Built-in OPC XML-DA and OPC UA server
- Access to network statistics via SNMP
- Compliant with ANSI/ASHRAE 135-2012 and ISO 16484-5:2012 standard
- Supports BACnet/IP, BACnet/SC or BACnet MS/TP
- BACnet Client Function (Write Property, Read Property, COV Subscription)
- BACnet Client Configuration with configuration tool (scan and EDE import)
- B-BC (BACnet Building Controller) functionality, BTL certified
- Modbus TCP and Modbus RTU/ASCII (Master or Slave)
- Integrated web server for device configuration and monitoring data points

¹ requires L-IOT1 software license

LIOB-591

- DALI integration of up to 64 DALI lamps
- Integrated DALI power supply, 16 VDC, 116 mA max. current
- Integrated 1250 W heater control
- Integrated dual fan motor control
- 8 x Universal I/O (U, I, R), 12 x Universal I/O (U) ²
- Integrated heating/cooling valve control
- Supports VPN
- Configurable Bluetooth beacons and services: indoor navigation, asset tracking (requires LIC-ASSET license) and access to LWEB-900 room control solution

General Specifications

| | |
|----------------------|------------------------------------------------------------------------------------------|
| Dimensions (mm) | 199 x 87 x 62 (L x W x H), DIM065 |
| Installation | mountable directly via two oblong holes (ø 4.5 mm, distance 187 mm) |
| Power supply | 85 – 240 V AC, 50 – 60 Hz |
| Operating conditions | 0 °C to 45 °C, 10 – 90 % RH, noncondensing, degree of protection: IP30, IP20 (terminals) |

Specifications

| | |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type | LIOB-591 |
| Power consumption | max. 15 W ³ |
| Interfaces | <p>2 x Ethernet (100Base-T): Web services (OPC XML-DA, OPC UA), BACnet/IP*, BACnet/SC*, LIOB-IP, Modbus TCP (Master or Slave), HTTP, FTP, SSH, HTTPS, Firewall, VNC, SNMP, VPN</p> <p>2 x USB-A: WLAN (needs LWLAN-800), EnOcean (needs LENO-80x), MP-Bus (needs LMPBUS-804), SMI (needs LSMI-804), LTE (needs LTE-800)</p> <p>1 x RS-485 (ANSI TIA/EIA-485): BACnet MS/TP* or Modbus RTU/ASCII (Master or Slave) or L-STAT (Room operator panel)</p> <p>1 x DALI with integrated DALI bus power supply 16 VDC, 116 mA max. supply current ⁴</p> <p><i>* Either BACnet/IP or BACnet/SC or BACnet MS/TP (no router)</i></p> |
| Universal I/O (IO) | 8 x Universal I/O (U, I, R), 12 x Universal I/O (U) ² |
| Digital Output (DO) | 1 x TRIAC 1250 W, 230 V AC (connector for overtemperature safety device) 3 x TRIAC 300 W, 230 V AC |
| Input and Output specification | Please refer to the "General Input and Output Specification of LOYTEC devices" at the end of the L-IOB section for more details. |
| L-IOB I/O extension | 1 L-IOB I/O Modules of Type LIOB-45x or LIOB-55x/56x |
| Program cycle time | Event-triggered, 10 ms |
| Max. number of Rooms/Segments | 1 |
| SMI devices via LSMI-804 | 16 |
| SMI devices (maximum) | 16 |
| EnOcean devices via LENO-80x | 10 |
| EnOcean devices (maximum) | 10 |
| EnOcean devices commissioning limit | 10 |
| L-STAT Room Operator Panels | 1 |
| DALI devices | 64 |
| DALI groups | 16 |
| DALI sensors | 16 |
| DALI pushbuttons (LDALI-BM2) | 64 pushbutton coupler |
| MP-Bus devices via LMPBUS-804 | 8 (16 MPL) |
| MP-Bus devices (maximum) | 16 |

² U: 0-10V input or 0-10V output, I: 4-20 mA input, R: resistance measurement

³ Add external load: Sum of max. current drawn from all outputs x 24V + power drawn from USB and L-STAT connectors

⁴ With high DALI traffic (e.g. during DALI-scan) increased current consumption may occur depending on the devices connected. Therefore, according to IEC62386-101 it is recommended to take an additional current of at least 20% for dynamic processes into account in system design.

| Runtime licenses | |
|--------------------|------------------------------------------------------------------|
| Programming, Tools | L-STUDIO software (IEC 61131-3 or IEC 61499), L-INX Configurator |
| License | L-STUDIO: included |

| Resource limits | | | |
|--------------------------------|------------------------------------|---------------------------------|-----------------------|
| Total number of data points | 10 000 | Math objects | 50 |
| OPC data points | 5 000 | Alarm logs | 10 |
| BACnet objects | 500 (analog, binary, multi-state) | Modbus data points | 300 |
| BACnet client mappings | 500 | Connections (Local / Global) | 2 000 / 250 |
| BACnet calendar objects | 25 | Number of L-WEB clients | 32 (simultaneously) |
| BACnet scheduler objects | 100 (64 data points per object) | L-IOB I/O Modules (via LIOB-IP) | 1 |
| BACnet notification classes | 32 | EnOcean data points | 10 per EnOcean device |
| Trend logs (BACnet or generic) | 256 (13 000 000 entries, ≈ 200 MB) | SMI devices | 16 |
| Total trended data points | 256 | MP-Bus devices | 8 (16 MPL) |
| E-mail templates | 50 | | |

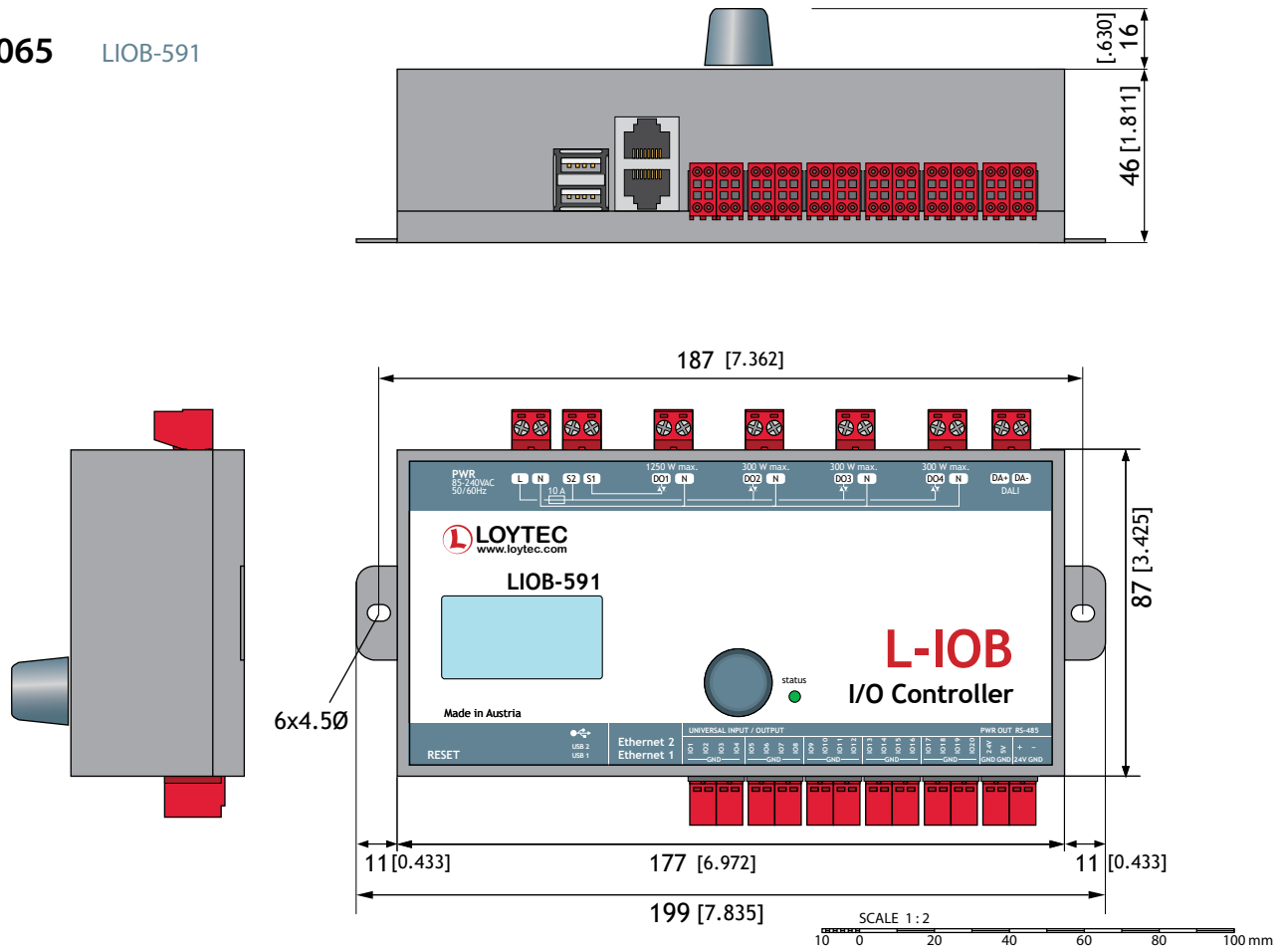
| Order number | Product description |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| LIOB-591 | L-IOB Room Controller, 8 x Universal I/O (U, I, R), 12 x Universal I/O (U), 1 x TRIAC 1250 W, 3 x TRIAC 300 W |
| L-STUDIO | Development and integration platform for programmable LOYTEC controllers |
| L-IOT1 | Add-on Software License to enable IoT functionality on LIOB-585/586/587/588/589/59x, LIOB-AIR, and LINX-102/103/202/203 |
| LIC-ASSET | Add-on Software License to activate asset tracking (for LDALI-ME20x-U, LDALI-3E10x-U, LDALI-PLCx, LROC-400, LROC-401, LIOB-AIR20, LIOB-591) |
| LENO-800 | EnOcean Interface 868 MHz Europe |
| LENO-801 | EnOcean Interface 902 MHz USA/Canada |
| LENO-802 | EnOcean Interface 928 MHz Japan |
| LWLAN-800 | Wireless LAN Interface IEEE 802.11 bgn |
| LTE-800 | LTE Interface |
| LRS232-802 | USB to 2 x RS-232 Interface |
| LMPBUS-804 | MP-Bus interface for 16 devices per channel, up to 4 channels |
| LSMI-804 | Standard Motor Interface for 64 motors, 4 SMI channels via USB |
| LIOB-450 | LIOB-IP852 I/O Module: 8 UI, 2 DI, 2 AO, 8 DO (4 x Relay 6 A, 4 x Triac 0.5 A) |
| LIOB-451 | LIOB-IP852 I/O Module: 8 UI, 12 DI |
| LIOB-452 | LIOB-IP852 I/O Module: 6 UI, 6 AO, 8 DO (8 x Relay 6 A) |
| LIOB-453 | LIOB-IP852 I/O Module: 6 UI, 6 AO, 5 DO (4 x Relay 16 A, 1 x Relay 6 A) |
| LIOB-454 | LIOB-IP852 I/O Module: 7 UI, 4 AO, 7 DO (5 x Relay 6 A, 2 x Triac 0.5 A), 1 Pressure Sensor |
| LIOB-550 | LIOB-BIP I/O Module: 8 UI, 2 DI, 2 AO, 8 DO (4 x Relay 6 A, 4 x Triac 0.5 A) |
| LIOB-551 | LIOB-BIP I/O Module: 8 UI, 12 DI |
| LIOB-552 | LIOB-BIP I/O Module: 6 UI, 6 AO, 8 DO (8 x Relay 6 A) |
| LIOB-553 | LIOB-BIP I/O Module: 6 UI, 6 AO, 5 DO (4 x Relay 16 A, 1 x Relay 6 A) |
| LIOB-554 | LIOB-BIP I/O Module: 7 UI, 4 AO, 7 DO (5 x Relay 6 A, 2 x Triac 0.5 A), 1 Pressure Sensor |
| LIOB-560 | LIOB-BIP I/O Module: 20 Universal I/O (IO) |
| LIOB-562 | LIOB-BIP I/O Module: 40 Universal I/O, (12 optionally with 4-20 mA current output) |
| LSTAT-800-G3-Lx | Room Operator Panel, black front, white enclosure, Modbus, temperature, rel. humidity, ext. switch/NTC, IR receiver, Buttons (Lx) |
| LSTAT-801-G3-Lx | Room Operator Panel, front black, white enclosure, Modbus, temperature, rel. humidity, ext. switch/NTC, occupancy, IR receiver, Buttons (Lx) |
| LSTAT-802-G3-Lx | Room Operator Panel, front black, white enclosure, Modbus, temperature, rel. humidity, ext. switch/NTC, occupancy, IR receiver, CO2, Buttons (Lx) |
| LSTAT-800-G3-L20x | Room Operator Panel, white front, white enclosure, Modbus, temperature, rel. humidity, ext. switch/NTC, IR receiver, Buttons (Lx) |
| LSTAT-801-G3-L20x | Room Operator Panel, white front, white enclosure, Modbus, temperature, rel. humidity, ext. switch/NTC, occupancy, IR receiver, Buttons (Lx) |

LIOB-591

| Order number | Product description |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LSTAT-802-G3-L20x | Room Operator Panel, white front, white enclosure, Modbus, temperature, rel. humidity, ext. switch/NTC, occupancy, IR receiver, CO2, Buttons (Lx) |
| LSTAT-80x-CUSTOM | One-time customization cost for L-STAT custom design, including 2 working samples |
| LDALI-MS2-BT | DALI multi-sensor (presence detection, illuminance sensor, IR receiver, temperature sensor, humidity sensor, 3 digital inputs, Bluetooth), up to 12 m mounting height |
| LDALI-MS3-BT | DALI multi-sensor (presence detection, illuminance sensor, IR receiver, temperature sensor, humidity sensor, 3 digital inputs, Bluetooth), up to 12 m mounting height |
| LDALI-MS4-BT | DALI multi-sensor (presence detection, illuminance sensor, IR receiver, temperature sensor, humidity sensor, 3 digital inputs, Bluetooth, flat lens), up to 5 m mounting height |
| LDALI-BM2 | Quadruple DALI pushbutton coupler |
| LDALI-RM5 | DALI Relay Module 10 A, Analog Interface 1 – 10 V |
| LDALI-RM6 | DALI Relay Module 10 A, Analog Interface 1 – 10 V, "spud-mount" |
| LDALI-RM8 | DALI Relay Module, 8-channel |
| LOY-DALI-SBM1 | DALI Sunblind Module, DALI, 2 x 6A/250 V AC |
| LDALI-PWM4 | PWM module, DALI, 4 x 3 A LED outputs, 24 V DC ext. |
| LDALI-PWM4-TC | PWM module tunable white, DALI, 4 x 3 A LED outputs, 24 V DC ext. |
| LDALI-PWM4-RGBW | PWM module RGBW, DALI, 4 x 3 A LED outputs, 24 V DC ext. |
| LDALI-PD1 | DALI Phase-Cut Dimmer Module |
| L-TEMP2 | External temperature sensor (NTC10K) for use with L-IOB Universal Inputs |

Dimensions of the devices in mm and [inch]

DIM065 LIOB-591



The products of LOYTEC electronics GmbH are subject to constant development. Therefore, LOYTEC reserves the right to modify technical specifications at any time without prior notice. The most recent datasheet can be downloaded from www.loytec.com.