✓ BACnet ✓ Modbus
✓ DALI
✓ OPC

LOYTEC
COMPETENCE PARTNER

L-IOB Room Controller

LIOB-591

Datasheet #89072124
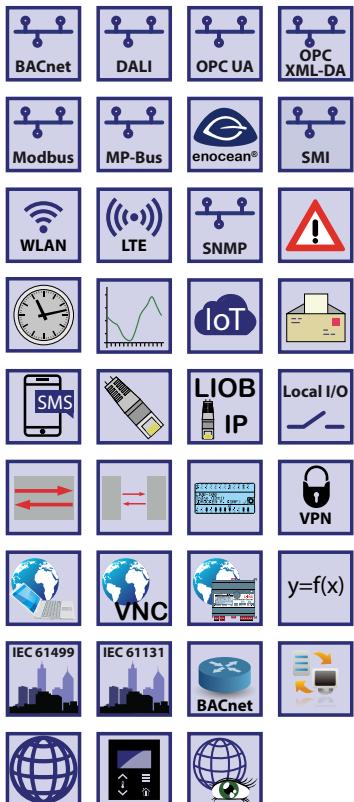
The LIOB-591 fan coil controller provides the basis for a revolutionary room automation system based on IP, which seamlessly integrates with native BACnet/IP networks at the controller level. Together with the L-STUDIO software, room control solutions can be created with little effort. Integral parts 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)
- 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 support[1] 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 and 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
- Integrated BACnet/IP to BACnet/SC and BACnet MS/TP Router including BBMD as well as Slave-Proxy functionality
- 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

Functions

L-WEB, L-STUDIO

L-ROC

L-INX

L-IOB

Gateways

LPAD-7,
L-VIS, L-STAT

L-DALI

Routers, NIC

Interfaces

Accessories

L-IOB Room Controller

LIOB-591

- DALI integration of up to 64 DALI lamps
- Integrated DALI power supply, 16 V DC, 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	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
	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)

	1 x RS-485 (ANSI TIA/EIA-485):
	    BACnet MS/TP*
	    or Modbus RTU/ASCII (Master or Slave)
	    or L-STAT (Room operator panel)
	1 x DALI with integrated DALI bus power supply 16 V DC,
	    116 mA max. supply current [4]
	
	* Router between BACnet/IP, BACnet/SC and BACnet MS/TP

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
BACnet/IP Router	1
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.

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L-INX

L-IOB

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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, $\approx$ 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 802.11bgn
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
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)
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	DALI-2 multi-sensor (presence detection, illuminance sensor, IR receiver, temperature sensor,
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-MS4-BT	DALI multi-sensor (presence detection, illuminance sensor, IR receiver, temperature sensor, humidity sensor, 3 digital inputs, Bluetooth, flat lense), 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
L-TEMP2	External temperature sensor (NTC10K) for use with L-IOB Universal Inputs

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Interfaces

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Dimensions of the devices in mm and [inch]

DIM065 LIOB-591
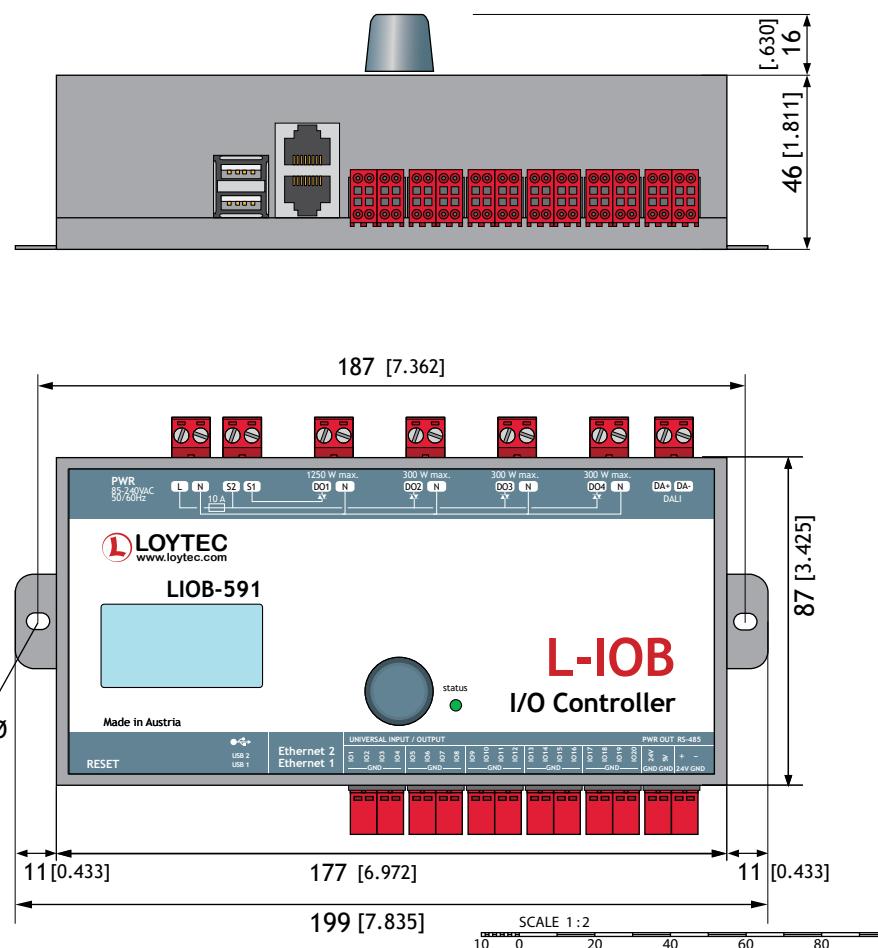
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