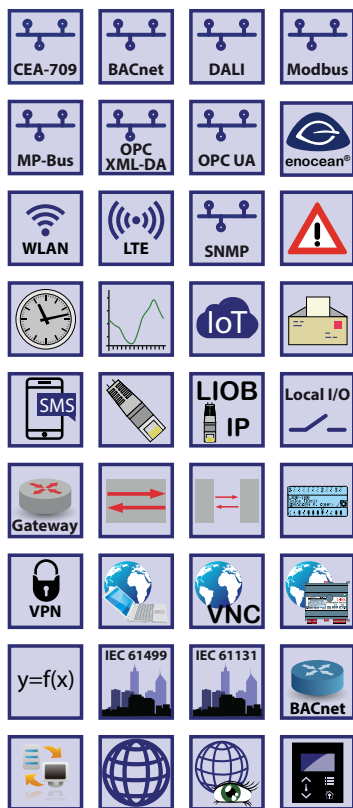
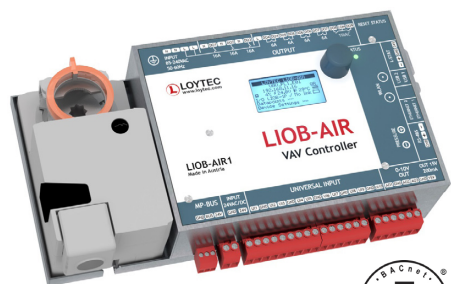


- ✓ BACnet
- ✓ CEA-709
- KNX
- ✓ Modbus
- ✓ MP-Bus
- ✓ OPC



Datasheet #89033125



LIOB-AIR is a fully IP based variable air volume controller (VAV controller) with a predefined, flexible, reprogrammable application program and sophisticated management functions for a building ventilation system.

The L-STUDIO AIR designer supports fast and flexible project design meeting any VAV system requirements. Each VAV controller has a BACnet and an OPC network interface and integrates seamlessly into every BMS. The graphic pages for operation, supervision, and device configuration are hosted on the LIOB-AIR eliminating the need for a Tridium or whatsoever middleware component. Without any additional effort L-STUDIO AIR seamlessly integrates into the LWEB-900 building management system. Local trending and alarming provide in depth operating conditions to the BMS. Local scheduling allows reliable zone operation even if the network is down. Sophisticated DCV algorithms save energy and 24/7 online test algorithms ensure proper system operation and detect malfunctioning devices like a blocked damper actuator, a stuck reheat valve, a dead series fan, etc.

Communication can be established via Ethernet or via the optional meshed WLAN. The dual Ethernet interface allows daisy chaining VAV controllers for simple network wiring. The optional built-in WLAN supports diversity antennas for reliable wireless communication in a self-healing meshed network topology. A dedicated port connects the L-STAT room operator panel for user interaction tasks. The built-in damper actuator communicates via MP-Bus and provides detailed status information. The built-in differential pressure sensor is used to measure the air flow. A number of universal inputs and analog and digital outputs can be configured to connect additional sensors and actuators. Additional devices are supported by an extra L-IOB, by RS-485 or wireless by EnOcean. An optional LTE-800 connected to the USB port allows for remote site access over a mobile network.

IoT Integration

The IoT function (Node.js) allows connecting the system to almost any cloud service, either for uploading historical data to analytics services, telemetry using MQTT, delivering alarm messages to alarm processing services or operating parts of the control system over a cloud service (e.g., scheduling based on Web calendars or booking systems). Processing Internet information such as weather data in forecast-based control is also possible. Finally, the JavaScript kernel also allows implementing serial protocols to non-standard equipment in primary plant control.

DALI Integration

The LIOB-AIR20 model provides an additional DALI communication port. This model allows for easy integration of lighting functions in the LIOB-AIR controller without the need for a separate L-DALI device. While having the comfort of using all L-DALI functions directly on the LIOB-AIR this reduces cost of installation giving this model a competitive edge in LIOB-AIR projects that require lighting solutions as well.

Features

- I/O controller with physical inputs and outputs
- Specific application program for variable air volume control
- Networking via redundant IP network
- Alarming, Scheduling, and Trending (AST™)
- Node.js support* for easy IoT integration (e.g. Google calendar, MQTT, Alexa & friends, multimedia equipment,...)
- Trending of all important data points in the controller
- Configuration and parameterization with L-STUDIO
- Room controller for up to 8 room segments
- Integration of the L-STAT Room Operator Panel
- Integrated LWEB-802/803 room operation
- Integrates seamlessly into the LWEB-900 system
- Built-in web server for device configuration
- Extension with physical inputs and outputs using one L-IOB I/O Module (LIOB-45x/LIOB-55x)
- Dual Ethernet/IP interface
- Supports BACnet/IP or BACnet/SC
- Supports BACnet MS/TP (LIOB-AIR1 and LIOB-AIR20 only)

*requires L-IOT1 software license

L-IOB I/O Controller with Application Program

LIOB-AIR1/AIR2/AIR13/AIR20

- B-BC (BACnet Building Controller) functionality, BTL certified
- Integrated OPC XML-DA and OPC UA server
- Manual control using the jog dial
- Remote manual control via VCN client
- 128x64 graphical display with backlight
- Local display of device and data point information as clear text and via symbols
- Easy device replacement without any additional software
- Supports EnOcean:
LIOB-AIR20: built-in;
LIOB-AIR1, LIOB-AIR2, LIOB-AIR13: needs LENO-80x
- Supports WLAN:
LIOB-AIR1, LIOB-AIR13, LIOB-AIR20: built-in;
LIOB-AIR2: needs LWLAN-800
- Supports LTE through LTE-800 Interface
- DALI Integration (LIOB-AIR20 only)
- Integration of an actuator via MP-Bus
- Differential pressure sensor
- Damper actuator included
- Configurable Bluetooth beacons and services: indoor navigation, asset tracking (requires LIC-ASSET license) and access to LWEB-900 room control solution (only LIOB-AIR20)

Supported VAV types

- Standard VAV (only Air Flow Control without reheat and without fan)
- VAV with electric reheat up to 3 stages
- VAV with hot water reheat
- VAV with series fan
- VAV with series fan and electric reheat up to 3 stages
- VAV with series fan and hot water reheat
- VAV with parallel fan and electric reheat up to 3 stages
- VAV with parallel fan and hot water reheat
- All reheats can also have optional peripheral heat

Supported inputs (sensors)

- Pressure (internal)
- Space temperature
- Space temperature setpoint, absolute setpoint and/or offset
- Occupancy sensor
- Occupancy override (setback override)
- Discharge temperature

- CO₂ or VOC sensor
- Relative humidity
- Window contact
- Damper feedback
- Flow setpoint external (European version)

Supported outputs (actuators)

- Damper MP-Bus
- Damper modulating
- Damper floating
- Parallel fan (also EC motors are supported)
- Series fan (also EC motors are supported)
- Reheat hot water modulating
- Reheat hot water floating
- Reheat electric modulating
- Reheat electric up to 3 stages
- Peripheral heat modulating
- Peripheral heat floating
- Peripheral heat on / off

The LIOB-AIR VAV controller integrates the following applications:

- Flow Control
- Flow Configuration
- Flow Alarms
- Air Flow Calibration
- Space Temperature Control
- Sequence Control
- Space Temperature Alarms
- Space Temperature Setpoint Control
- External Space Temperature Setpoint
- Occupancy Control
- Discharge Temperature Control
- CO₂ or VOC Control
- Humidity control
- External Flow Setpoint Operation
- Data aggregation to the Air Handling Unit
- Group Functions

Specifications				
Type	LIOB-AIR1	LIOB-AIR2	LIOB-AIR13	LIOB-AIR20
Dimensions (mm)	260 x 120 x 68 (L x W x H), DIM043		208 x 120 x 68 (L x W x H), DIM044	
Installation	mountable on the corresponding volume flow actuator		mountable via oblong holes	
Operating conditions	0 °C to 50 °C, 10–90 % RH, noncondensing, degree of protection: IP20			
Power supply	85-240 VAC 50/60Hz or 24 VDC / 24 VAC ±10 %	24 VDC / 24 VAC ±10 %		85-240 VAC 50/60Hz
L-IOB I/O Module	1 L-IOB I/O Module of type LIOB-BIP			
Interfaces	2 x Ethernet (100Base-T): OPC XML-DA, OPC UA, LonMark IP-852, BACnet/IP, BACnet/SC, Modbus TCP, LIOB-IP, HTTP, FTP, SSH, HTTPS, Firewall, SNMP, VNC 1 x L-STAT (Room Operator Panel) 1 x MP-Bus (actuator)			
	2 x USB-A EnOcean (needs LENO-80x) LTE (needs LTE-800) WLAN (needs LWLAN-800)		2 x USB-A LTE (needs LTE-800) WLAN (needs LWLAN-800)	
	1 x RS-485 (ANSI TIA/EIA-485): BACnet MS/TP or Modbus RTU/ASCII (Master or Slave) 1 x Internal WLAN (2 x SMA)	–	1 x Internal WLAN (2 x SMA)	1 x RS-485 (ANSI TIA/EIA-485): BACnet MS/TP or Modbus RTU/ASCII (Master or Slave) 1 x Internal WLAN (2 x SMA) 1 x DALI Integrated DALI bus power supply (per channel): 16 V DC, 230 mA guaranteed supply current***, 250 mA max. supply current 1 x EnOcean (USA/Canada 902 MHz) with external antenna
Universal Input (UI)	10	10	10	10
Analog Output (AO)	3	3	3	3
Digital Output (DO)	9 (3 x Relay 16 A, 4 x Relay 6 A, 2 x Triac 0.5 A)	6 (4 x Relay 6 A, 2 x Triac 0.5 A)	6 (4 x Relay 6 A, 2 x Triac 0.5 A)	6 (4 x Relay 10 A, 2 x Triac 0.5 A)
Digital 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.			
Differential Pressure Sensor	0–250 Pa			±500 Pa
Power supply output	18 VDC, max. 200 mA			
Actuator	Torque rating: 5 N m			
Max. number of Rooms/Segments	8	8	8	8
Certificates	UL	UL	UL pend.	UL pend.

Runtime licenses

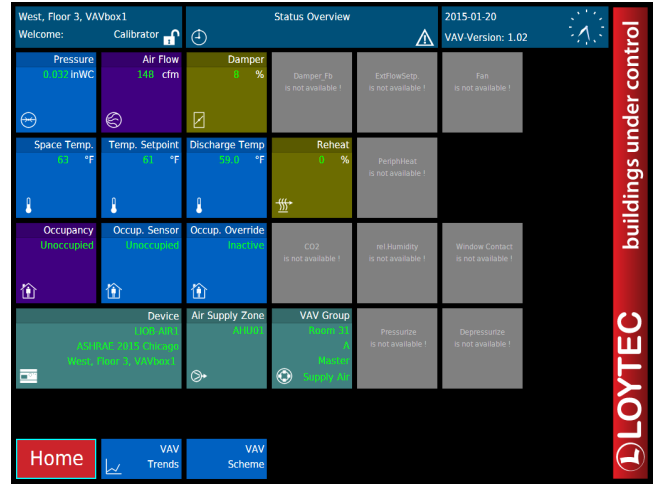
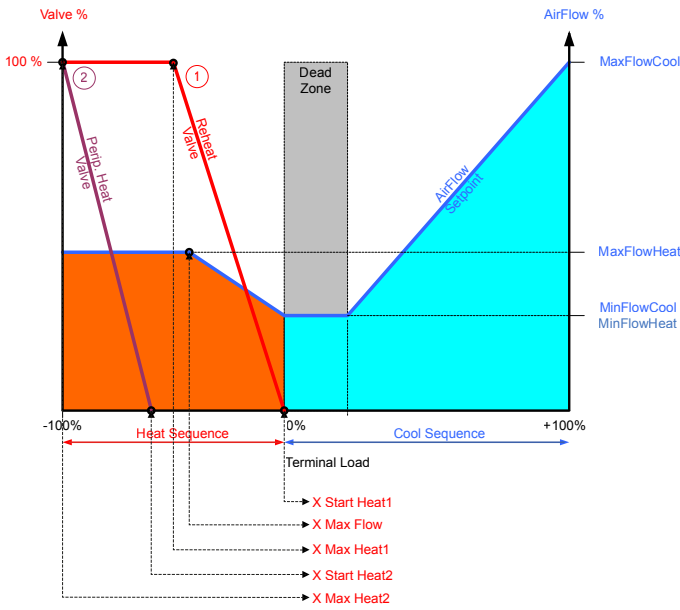
Type	LIOB-AIR1	LIOB-AIR2	LIOB-AIR13	LIOB-AIR20
Programming, Tools	L-STUDIO (IEC 61131-3 and IEC 61499 based)			
License	L-STUDIO: included	L-STUDIO: included	L-STUDIO: included	L-STUDIO: included

***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.

L-IOB I/O Controller with Application Program

LIOB-AIR1/AIR2/AIR13/AIR20

Sequence Control



Resource limits

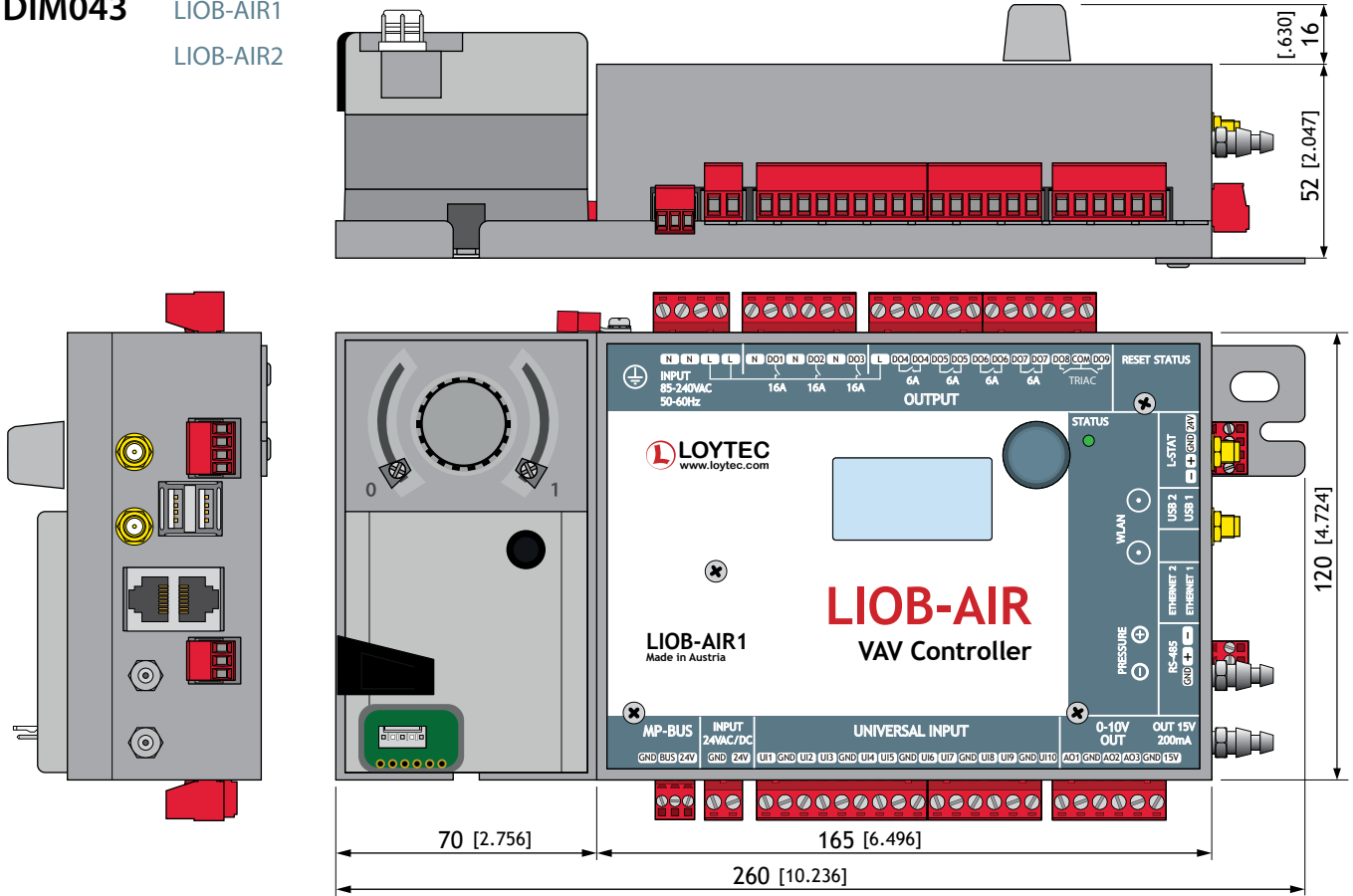
Total number of data points	30 000	CEA-709 External NVs (polling)	2 000
OPC data points	10 000	CEA-709 address table entries	1 000 (non-ECS mode: 15)
BACnet objects	2 000 (analog, binary, multi-state)	LonMark Calendars	1 (25 calendar patterns)
BACnet client mappings	1 000	LonMark Schedulers	100
BACnet calendar objects	25	LonMark Alarm Servers	1
BACnet scheduler objects	100 (64 data points per object)	E-mail templates	100
BACnet notification classes	32	Math objects	100
Trend logs (BACnet or generic)	512 (13 000 000 entries, ≈ 200 MB)	Alarm logs	10
Total trended data points	2 000	Connections (Local / Global)	4 000 / 250
CEA-709 network variables (NVs)	2 000	Number of L-WEB clients	32 (simultaneously)
CEA-709 Alias NVs	2 000	Number of EnOcean devices	100

Order number Product description

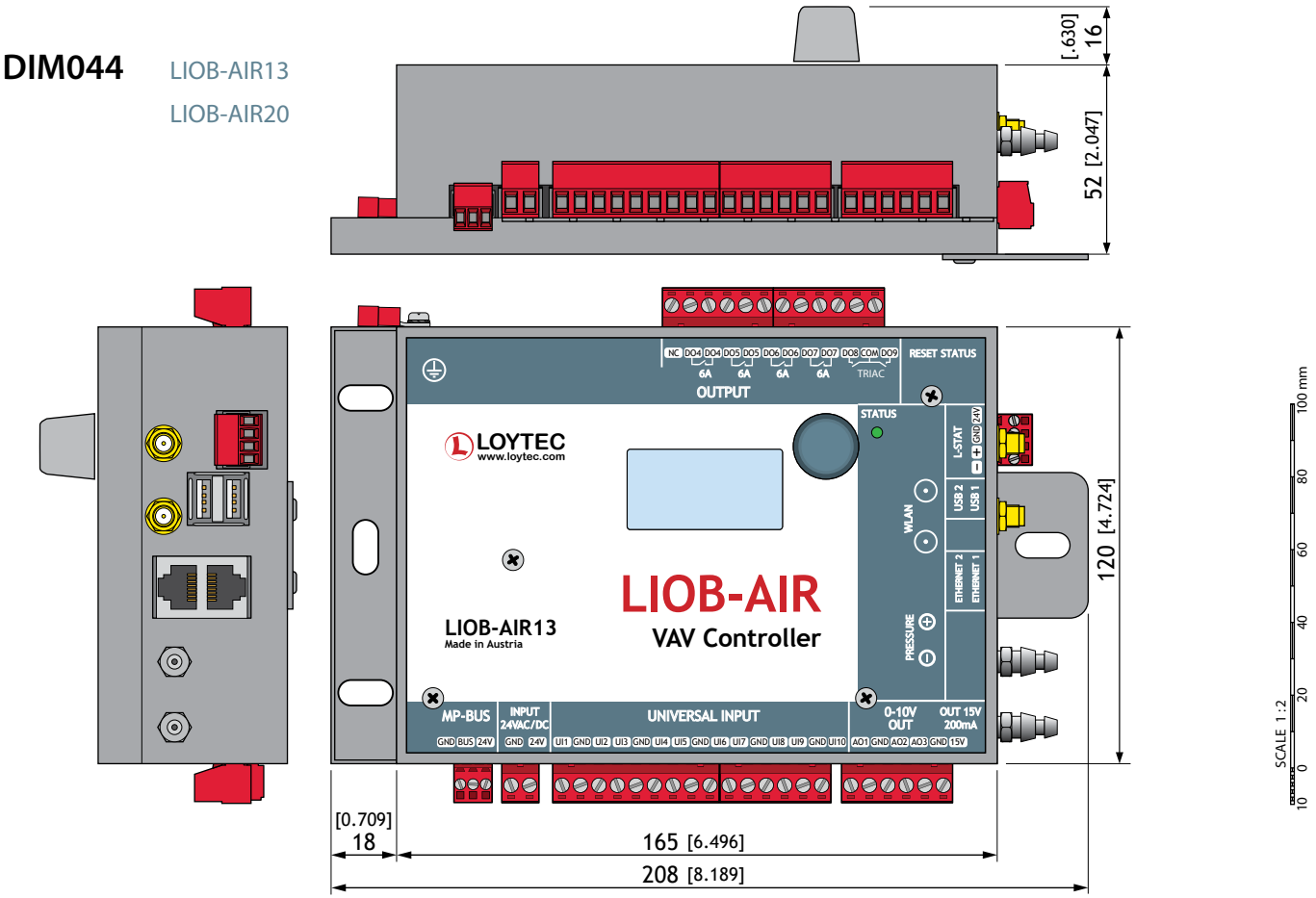
LIOB-AIR1	L-IOB controller with application program variable air volume control, actuator included
LIOB-AIR2	L-IOB controller with application program variable air volume control, actuator included
LIOB-AIR13	L-IOB controller with application program variable air volume control, actuator included
LIOB-AIR20	L-IOB controller with application program variable air volume control, DALI lighting control, actuator included
L-STUDIO	Development and integration platform for programmable LOYTEC controllers
L-ACT101-MP	Actuator 5/8", 5 Nm, 45in-lb, MP-Bus cable
L-ACT102-MP	Actuator 3/4", 5 Nm, 45in-lb, MP-Bus cable
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)
L-TEMP2	External temperature sensor (NTC10K) for use with L-IOB Universal Inputs
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

Dimensions of the devices in mm and [inch]

DIM043 LOIB-AIR1
 LOIB-AIR2



DIM044 LOIB-AIR13
 LOIB-AIR20



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.