Date: January 24, 2022
Vendor Name: LOYTEC electronics GmbH
Product Name: L-DALI BACnet DALI Controller
Product Model Number: LDALI-ME201-U, LDALI-ME204-U, LDALI-PLC2/PLC4
Applications Software Version: V7
Firmware Revision: 7.6
BACnet Protocol Revision: 135-2020 (1.16)

Product Description:

This product implements a DALI-BACnet gateway. It allows mapping of up to four DALI channels, that is, 4 x 64 DALI devices to BACnet objects. It provides Analog Output objects to control each DALI device as well as Analog Output objects to control DALI groups and channels. Further, Multi-State Output objects are used to map DALI scenes. Analog Input objects provide the feedback value for DALI devices, groups and channels as well as group and channel status information. Additional Analog Input objects and Binary Input objects provide lux level and occupancy information from DALI sensors. Loop objects provide constant light controller functionality. The device also implements BACnet Schedule, Calendar, Trend Log, and Notification Class objects. The product is equipped with a BACnet/IP and – depending on the product model – a BACnet MS/TP communication interface. The LDALI-PLC2/PLC4 models have 2 or 4 DALI channels and add a programmable logic kernel that is engineered using the L-STUDIO software.

BACnet Standardized Device Profile (Annex L):

☑ BACnet Building Controller (B-BC)

BACnet Interoperability Building Blocks Supported (Annex K):

Data Sharing – ReadProperty-A (DS-RP-A)
Data Sharing – ReadProperty-B (DS-RP-B)
Data Sharing – ReadPropertyMultiple-A (DS-RPM-A)
Data Sharing – ReadPropertyMultiple-B (DS-RPM-B)
Data Sharing – WriteProperty-A (DS-WP-A)
Data Sharing – WriteProperty-B (DS-WP-B)
Data Sharing – WritePropertyMultiple-B (DS-WPM-B)
Data Sharing – COV-A (DS-COV-A)
Data Sharing – COV-B (DS-COV-B)
Data Sharing – COVP-A (DS-COVP-A)
Data Sharing – COVP-B (DS-COVP-B)
Data Sharing – COV Unsubscribed-B (DS-COVU-B)
Alarm and Event Management – Notification Internal-B (AE-N-I-B)
Alarm and Event Management – Notification External-B (AE-N-E-B)
Alarm and Event Management – Acknowledge-B (AE-ACK-B)
Alarm and Event Management – Alarm Summary-B (AE-ASUM-B)
Alarm and Event Management – Enrollment Summary-B (AE-ESUM-B)
Alarm and Event Management – Information-B (AE-INFO-B)
Alarm and Event Management – Configurable Recipient Lists-B (AE-CRL-B)
Scheduling – Internal-B (SCHED-I-B)
Scheduling – External-B (SCHED-E-B)
Trending – Viewing and Modifying Trends Internal-B (T-VMT-I-B)
Trending – Viewing and Modifying Trends External-B (T-VMT-E-B)
Trending – Automated Trend Retrieval-B (T-ATR-B)
Device Management – Dynamic Device Binding-A (DM-DDB-A)
Device Management – Dynamic Device Binding-B (DM-DDB-B)
Device Management – Dynamic Object Binding-B (DM-DOB-B)
Device Management – DeviceCommunicationControl-B (DM-DCC-B)
Device Management – TimeSynchronization-A (DM-TS-A)
Device Management – TimeSynchronization-B (DM-TS-B)
Device Management – UTCTimeSynchronization-A (DM-UTC-A)

Device Management – UTCTimeSynchronization-B (DM-UTC-B)
Device Management – ReinitializeDevice-B (DM-RD-B)
Device Management – Backup and Restore (DM-BR-B)
Device Management – Restart A (DM-R-A)
Device Management – Restart B (DM-R-B)
Device Management – List Manipulation-B (DM-LM-B)
Device Management – Object Creation and Deletion-B (DM-OCD-B)
Device Management – Automatic Time Synchronization-A (DM-ATS-A)
Network Management – BBMD Configuration-B (NM-BBMDC-B)
Network Management – Foreign Device Registration-A (NM-FDR-A)
Gateway – Embedded Objects-B (GW-EO-B)

Segmentation Capability:

Segmented requests supported, window size: 4
Segmented responses supported, window size: 4

Standard Object Types Supported:

For all object types listed below the following applies if not stated otherwise:
   1) Does not support the CreateObject and DeleteObject service
   2) Properties Object_Name, Description support up to 64 characters
   3) Includes the required properties as specified for the object type
   4) All commandable objects support the Priority_Array and Relinquish_Default with 16 freely usable priorities
   5) All Analog, Binary, Multi-state object types support COV subscriptions
   6) Additional writeable properties: Description
   7) No proprietary properties exist
   8) No range restrictions exist

Device Object

List of optional properties supported:
Location, Description, Max_Segments_Accepted, APDU_Segment_Timeout, Max_Master[1],
Active_COV_Subscriptions, Configuration_Files, Last_Restore_Time, Backup_Failure_Timeout, Local_Time,
Local_Date, UTC_Offset, Daylight_Saving_Status, Last_Restart_Reason, Time_Of_Device_Restart,
Restart_Notification_Recipients, Time_Synchronization_Recipients, UTC_Time_Synchronization_Recipients,
Time_Synchronization_Interval, Align_Intervals, Interval_Offset, Serial_Number, Backup_Preparation_Time,
Restore_Preparation_Time, Restore_Completion_Time, Backup_And_Restore_State

Analog Input

List of optional properties supported:
Description, Device_Type, Reliability, Update_Interval, Resolution, Min_Pres_Value, Max_Pres_Value,
COV_Increment, Time_Delay[2], Notification_Class[2], Low_Limit[2], High_Limit[2], Deadband[2], Limit_Enable[2],
Event_Enable[2], Acked_Transitions[2], Notify_Type[2], Event_Time_Stamps[2], Event_Message_Texts[2],
Event_Message_Texts_Config[2], Event_Detection_Enable[2], Event_Algorithm_Inhibit[2], Event_Algorithm_Inhibit_Ref[2],
Time_Delay_Normal[2], Reliability_Evaluation_Inhibit[2], Interface_Value, Fault_High_Limit, Fault_Low_Limit,
Profile_Name

List of proprietary properties (applies to objects that map to channel status only):
Device_Failure (529)   BIT STRING R   Only present if the object maps to a DALI channel status. One bit for
                                             each ballast on the channel (64 bit). Bit is 1 if ballast reports a failure.

[1] If device is operated with BACnet MS/TP enabled.
[2] Not included for objects mapping to Lamp, Group or Channel feedback.

Ballast_Failure (530)	BIT STRING	R	Only present if the object maps to a DALI channel status. One bit for each ballast on the channel (64 bit). Bit is 1 if ballast reports a ballast failure.
Lamp_Failure (531)	BIT STRING	R	Only present if the object maps to a DALI channel status. One bit for each ballast on the channel (64 bit). Bit is 1 if ballast reports a lamp failure.
Battery_Failure (532)	BIT STRING	R	Only present if the object maps to a DALI channel status. One bit for each ballast on the channel (64 bit). Bit is 1 if ballast reports a battery failure (emergency lights only).
Function_Test_Failure (533)	BIT STRING	R	Only present if the object maps to a DALI channel status. One bit for each ballast on the channel (64 bit). Bit is 1 if ballast reports a function test failure (emergency lights only).
Duration_Test_Failure (534)	BIT STRING	R	Only present if the object maps to a DALI channel status. One bit for each ballast on the channel (64 bit). Bit is 1 if ballast reports a duration test failure (emergency lights only).
Lux_2 (557)	REAL		Only present if the object maps to a DALI sensor. Second light level value reported by the sensor.
Bus_Power (563)	BACnetBinaryPV		Only present if the object maps to a DALI channel status. Active if the internal bus power is active for the channel and inactive if not.
Bus_Power_Failure (564)	BACnetBinaryPV		Only present if the object maps to a DALI channel status. Active if a DALI bus power failure was detected on the channel or inactive if the DALI bus power is present.
Bus_Power_Overload (565)	BACnetBinaryPV		Only present if the object maps to a DALI channel status. Active if the internal DALI bus power failed due to an overload or inactive if the internal DALI bus power is either disabled/not present or working properly.
Digital_Input_Override (571)	BIT STRING	R	Only present if the object maps to a DALI channel status. One bit for each RM8-ballast on the channel (64 bit). Bit is 1 if the relay state is forced to on by a digital input override.

Analog Output

List of optional properties supported:
Description, Device_Type, Reliability, Resolution, Min_Pres_Value, Max_Pres_Value, COV_Increment, Time_Delay, Notification_Class, Low_Limit, High_Limit, Deadband, Limit_Enable, Event_Enable, Acked_Transitions, Notify_Type, Event_Time_Stamps, Event_Message_Texts, Event_Message_Texts_Config, Event_Detection_Enable, Event_Algorithm_Inhibit, Event_Algorithm_Inhibit_Ref, Time_Delay_Normal, Reliability_Evaluation_Inhibit, Interface_Value, Profile_Name

List of all properties that are writable where not otherwise required by this standard:
Max_Pres_Value[3]

List of proprietary properties (applies to objects that map to lighting output only):

Power_On_Level (512)	REAL	W	Present value of lighting outputs after power on of lighting output. Only present if the object maps to a DALI device.
System_Failure_Level (513)	REAL	W	Present value of lighting outputs if lighting outputs loose communication with L-DALI. Only present if the object maps to a DALI device.
Fade_Time (514)	REAL	W	Amount of time in seconds over which changes to the actual value of the lighting output shall occur ("fading"). Only present if the object maps to a DALI device.
Ramp_Rate (515)	REAL	W	Rate in percent per seconds at which changes to the actual value of the lighting output shall occur ("ramping"). Only present if the object maps to a DALI device.

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[3] Only for objects mapping to a DALI device.

Min_Level (516)	REAL	W	Minimum possible on-dim-level. Only present if the object maps to a DALI device.
Groups (517)	BIT STRING	W	Group membership information (16-bit, one bit per group). Only present if the object maps to a DALI device.
Nominal_Power (518)	REAL	W	Nominal power of the DALI ballast, 0 for auto detect. Only present if the object maps to a DALI device.
Burn_In_Time (519)	Unsigned	W	Lamp burn-in time. Only present if the object maps to a DALI channel.
Dim_Mode (520)	Unsigned	W	Either 0 for "fading" or 1 for "ramping".
On_Delay_Time (521)	Unsigned	W	On delay time in seconds.
Off_Delay_Time (522)	Unsigned	W	Off delay time in seconds.
Warn_Delay (523)	Unsigned	W	Off-warning time in seconds.
Auto_Off_Time (524)	Unsigned	W	Auto-off time in seconds
Auto_Off_Mode (526)	Unsigned	W	"Disable break/restart" (0), "Enable break" (1), "Enable restart" (2), "Enable break/restart" (3)
Elapsed_Active_Time (527)	Unsigned	W	Accumulated time in seconds, which the corresponding DALI lamp was switched on. For groups or channels this gives the maximum time of all lamps in the group/channel. When writing 0 to this property the value is reset. For groups and channels the value for all lamps in the group/channel are reset.
Time_Of_Active_Time_Reset (528)	DateTime	R	Time and date the Elapsed_Active_Time was last reset.
Colour_Temp (567)	REAL	W	Control the color temperature of luminaires with tunable white support
Hue (569)	REAL	W	Control of hue-value of luminaire with colour support, only present it the object maps to a DALI device or DALI group
Saturation (570)	REAL	W	Control of saturation of luminaire with colour support, only present it the object maps to a DALI device or DALI group

List of any property value range restrictions:

Present_Value:	0 and Min_Level to Max_Pres_Value for objects mapping to a DALI device
Min_Level:	0.1 to Max_Pres_Value
Max_Pres_Value:	Min_Pres_Value to 100
Fade_Time:	0 to 90.51 s
Ramp_Rate:	2.795 to 357.796
Power_On_Level:	0 to 100 (or NaN for "mask")
System_Failure_Level:	0 to 100 (or NaN for "mask")
Dim_Mode:	0 or 1
Colour_Temp	K
Hue	0° to 360°
Saturation	0% to 100 %

Analog Value

List of optional properties supported (as applies):
Description, Device_Type, Reliability, Update_Interval, Min_Pres_Value, Max_Pres_Value, Resolution, COV_Increment, Time_Delay, Notification_Class, Low_Limit, High_Limit, Deadband, Limit_Enable, Event_Enable, Acked_Transitions, Notify_Type, Event_Time_Stamps, Event_Message_Texts, Event_Message_Texts_Config, Event_Detection_Enable, Event_Algorithm_Inhibit, Event_Algorithm_Inhibit_Ref, Time_Delay_Normal, Reliability_Evaluation_Inhibit, Interface_Value, Fault_High_Limit, Fault_Low_Limit

Binary Input

List of optional properties supported:
Description, Device_Type, Reliability, Polarity, Active_Text, Inactive_Text, Change_Of_State_Time, Change_Of_State_Count, Time_Of_State_Count_Reset, Elapsed_Active_Time, Time_of_Active_Time_Reset, Profile_Name

List of all properties that are writable where not otherwise required by this standard:
Active_Text[4], Inactive_Text[4]

List of proprietary properties (applies to DALI occupancy sensor objects only):

Debounce (535)	Unsigned	W	Debouncing time in seconds.
Unoccupied_Delay (536)	Unsigned	W	Occupancy hold time in seconds.
Heartbeat (558)	Unsigned	W	Maximum period of time that expires before the object automatically updates its *Present_Value*.
Acoustic_Sensitivity (573)	REAL		Only present if the object maps to a DALI occupancy sensor
PIR_Sensitivity (572)	REAL		Only present if the object maps to a DALI occupancy sensor

Binary Output, Binary Value

List of optional properties supported (as applies):
Description, Device_Type, Reliability, Active_Text, Inactive_Text, Time_Delay, Change_Of_State_Time, Change_Of_State_Count, Time_Of_State_Count_Reset, Elapsed_Active_Time, Time_of_Active_Time_Reset, Minimum_Off_Time, Minimum_On_Time, Notification_Class, Alarm_Value, Feedback_Value, Event_Enable, Acked_Transitions, Notify_Type, Event_Time_Stamps, Event_Message_Texts, Event_Message_Texts_Config, Event_Detection_Enable, Event_Algorithm_Inhibit, Event_Algorithm_Inhibit_Ref, Time_Delay_Normal, Reliability_Evaluation_Inhibit, Interface_Value

Multi-State Input, Multi-state Output, Multi-State Value

List of optional properties supported (as applies):
Description, Device_Type, Reliability, State_Text, Time_Delay, Notification_Class, Alarm_Values, Fault_Values, Feedback_Values, Event_Enable, Acked_Transitions, Notify_Type, Event_Time_Stamps, Event_Message_Texts, Event_Message_Texts_Config, Event_Detection_Enable, Event_Algorithm_Inhibit, Event_Algorithm_Inhibit_Ref, Time_Delay_Normal, Reliability_Evaluation_Inhibit, Interface_Value

List of all properties that are writable where not otherwise required by this standard:
State_Text[5]

Large Analog Value, Integer Value, Positive Integer Value

List of optional properties supported (as applies):
Description, Out_Of_Service, Event_State, Reliability, Min_Pres_Value, Max_Pres_Value, Resolution, COV_Increment, Time_Delay, Notification_Class, Low_Limit, High_Limit, Deadband, Limit_Enable, Event_Enable, Acked_Transitions, Notify_Type, Event_Time_Stamps, Event_Message_Texts, Event_Message_Texts_Config, Event_Detection_Enable, Event_Algorithm_Inhibit, Event_Algorithm_Inhibit_Ref, Time_Delay_Normal, Reliability_Evaluation_Inhibit, Fault_High_Limit, Fault_Low_Limit

CharacterString Value, OctetString Value

List of optional properties supported (as applies):
Description, Out_Of_Service, Reliability

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[4] Only for object mapping to a DALI input device.
[5] Only for objects that map to Scene Control for DALI group or channel, Commands for DALI ballast, group or channel

Notification Class Object, Schedule Object, Calendar Object

Supports the CreateObject and DeleteObject service.
List of optional properties supported (as applies):
Description, Weekly_Schedule, Exception_Schedule

Event Enrollment Object

Supports the CreateObject and DeleteObject service.
List of optional properties supported (as applies):
Description, Event_Message_Texts, Texts, Event_Message_Texts_Config, Event_Detection_Enable,
Event_Algorithm_Inhibit, Event_Algorithm_Inhibit_Ref, Time_Delay_Normal, Reliability_Evaluation_Inhibit

Trend Log Object

Supports the CreateObject and DeleteObject service.
List of optional properties supported:
Description, Start_Time, Stop_Time, Log_DeviceObjectProperty, Log_Interval, COV_Resubscription_Interval,
Client_COV_Increment, Align_Intervals, Interval_Offset, Trigger, Notification_Threshold, Records_Since_Notification,
Last_Notify_Record, Notification_Class, Event_Enable, Acked_Transitions, Notify_Type, Event_Time_Stamps,
Event_Message_Texts, Event_Detection_Enable, Reliability

Accumulator

List of optional properties supported:
Description, Device_Type, Reliability, Value_Change_Time, Value_Before_Change, Value_Set, Pulse_Rate,
Limit_Monitoring_Interval, Time_Delay, Notification_Class, Low_Limit, High_Limit, Limit_Enable, Event_Enable,
Acked_Transitions, Notify_Type, Event_Time_Stamps, Event_Message_Texts, Event_Message_Texts_Config,
Event_Detection_Enable, Event_Algorithm_Inhibit, Event_Algorithm_Inhibit_Ref, Time_Delay_Normal,
Reliability_Evaluation_Inhibit, Fault_High_Limit, Fault_Low_Limit

Pulse Converter

List of optional properties supported:
Description, Input_Reference, Reliability, COV_Increment, COV_Period, Time_Delay, Notification_Class, Low_Limit,
High_Limit, Deadband, Limit_Enable, Event_Enable, Acked_Transitions, Notify_Type, Event_Time_Stamps,
Event_Message_Texts, Event_Message_Texts_Config, Event_Detection_Enable, Event_Algorithm_Inhibit,
Event_Algorithm_Inhibit_Ref, Time_Delay_Normal, Reliability_Evaluation_Inhibit

Loop

List of optional properties supported:
Description, Reliability, COV_Increment, Update_Interval, Proportional_Constant, Proportional_Constant_Units,
Integral_Constant, Integral_Constant_Units, Derivative_Constant, Derivative_Constant_Units, Bias, Maximum_Output,
Minimum_Output, Time_Delay, Notification_Class, Error_Limit, Deadband, Event_Enable, Acked_Transitions,
Notify_Type, Event_Time_Stamps, Event_Message_Texts, Event_Message_Texts_Config, Event_Detection_Enable,
Event_Algorithm_Inhibit, Event_Algorithm_Inhibit_Ref, Time_Delay_Normal, Reliability_Evaluation_Inhibit,
Low_Diff_Limit, Profile_Name

List of proprietary properties (applies to objects mapped to constant light controller application only):

Occupancy_Variable_Reference (537)	ObjPropRef	W	Specifies the object and property used to set the Occupancy_Variable property (538) of the Loop object.
Occupancy_Variable (538)	Unsigned	W	Occupancy input for constant light controller. 0 for unoccupied, 1 for occupied.
Mode (539)	Unsigned	W	Constant light controller mode: "disabled" (0), "regulator" (1), "control" (2), "DALI" (3), "presence" (4), "regulator w/o occupancy" (5), "control w/o occupancy" (6), "manual on/auto off" (7)
Hold_Time (540)	Unsigned	W	Occupancy hold time in seconds.

Ignore_Time (541)	Unsigned	W	Occupancy ignore time after switching off in seconds.
Occupied_Level (542)	REAL	W	Output level in presence mode, occupied state.
Unoccupied_Level (543)	REAL	W	Output level in presence mode, unoccupied state.
Step_Value (544)	REAL	W	Step value for the constant light controller algorithm in percent.
On_Hysteresis (545)	REAL	W	Constant light controller algorithm hysteresis for switching lights on in percent.
Off_Hysteresis (546)	REAL	W	Constant light controller algorithm hysteresis for switching lights off in percent.
Off_Delay (547)	Unsigned	W	Constant light controller off delay in seconds.
On_Delay (548)	Unsigned	W	Constant light controller on delay in seconds.
Lamp_2_Offset (550)	REAL	W	Maximum offset between the output for the primary light band and the secondary light band.
Lamp_2_Limit (551)	REAL	W	Dim level at which the output for the secondary light band becomes identical to the primary output.
Override (560)	REAL	W	Can be used to manually override the constant light controller.
Auto_Mode (561)	REAL	W	Current state of the constant light controller.
Occupancy_State (562)	REAL	W	Occupancy state calculated by the constant light controller.
Lux_Upper_Limit (566)	REAL	W	Upper lux limit for light controller with linked sunblind controller in museum mode.
Sblnd_Hyst (568)	REAL	W	Hysteresis for linked sunblind controller in museum mode.

File Object

List of optional properties supported:
Description
Object limit: 1 File object. This object is used for configuration backup and restore.

Data Link Layer Options:

☑ BACnet IP, (Annex J)
☑ BACnet IP, (Annex J), Foreign Device
☑ MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400, 57600, 76800, 115200
☑ MS/TP master (Clause 9) supports extended length BACnet frames

Device Address Binding:

Static device address binding is supported.

Networking Options:

☐ Router, Clause 6
☐ Annex H, BACnet Tunneling Router over IP

Character Sets Supported:

The device is configurable for one of the following character sets at a time. It does not support them simultaneously.

☑ ANSI X3.4/UTF-8	☐ IBM™/Microsoft™ DBCS	☑ ISO 8859-1
☑ ISO 10646 (UCS-2)	☐ ISO 10646 (UCS-4)	☐ JIS C 6226

Gateway Options:

The L-DALI provides BACnet/DALI gateway functionality. DALI is a protocol defined in IEC 62386. Its main field of application is the lighting industry.

Additional Information and Contact:

Further Information, a detailed User Manual and firmware updates can be obtained from our website http://www.loytec.com.

For information and technical support please contact us at the following address:

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