

REMOTICOM
API ZSC150.



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Preface

The ZSC150 is an innovative and flexible module which is able to monitor and control the public lightning systems on remote. The ZSC150 uses DALI 2.0 to communicate over the ZHAGA connector with the DALI driver. The DALI controller will be monitored by the ZSC150 and in case of an error a message will be sent.

The ZSC150 is also equipped with a GPS module and a tilt sensor. The tilt sensor is used to detect collision. The ZSC150 will calibrate the tilt sensor the very first time it is turned on. The calibration process takes 48 burning hours. If the measured angle has a deviation more than 5°, a message will be sent.

To communicate over the internet the ZSC150 makes use of the LPWAN networks NB-IoT, LTE-M or 2G. On top of the LPWAN network the ZSC150 uses the MQTT protocol to create a more reliable way of sending data.

Data send by the device will go through a push API (see document MQTT-Push-API to learn more about this API. Data send to the device will go through another API. This API, data generated and collected by the ZSC150 will be discussed in this document.

Push Data

ZSC150 data can be send on interval, change or request. Data ready for publication will be added to a queue and send as soon as possible (matter of seconds). The ZSC150 will publish its data to the following topic:

rtm/zsc150/up

The interval can be set by the user, the chapter Request API will explain how to. The default value of this interval is set to once an hour.

Description	Type	Request	Change	First Boot	Boot	Interval
GENEREAL						
Timestamp	UInt32					
IP Address	UInt32	V				
Device type	UInt16	V		V		
Firmware version	UInt32	V		V		
IMSI	String	V		V		
ICCID	String	V				
BC68 Firmware version	String	V				
GPS Firmware version	String	V				
Operating hours	UInt32	V				
Send interval	UInt32	V				
Time zone	Int8	V				
DST	Boolean	V				
Operator code	UInt32	V				
GPS location	String	V			V	
Tilt alarm	Int16		V			
Mode	UInt8	V	V			
Ack token	UInt32	V				
Invalid parameters	UInt32					
Device error code	UInt16		V			V

DIM						
Planning	String	V				
Exceptions	String	V				
Emergency duration	UInt32	V				
Static dim level	UInt8	V				

Description	Type	Request	Change	First boot	Boot	Interval
DALI						
Error code	Uint16		V			
Driver firmware version	Uint32	V				
Operating hours	Uint32					V
Temperature	Uint8	V				
Power	Uint32	V				
Power unit	Int8					
Voltage	Uint16	V				
Current	Uint16	V				
Energy	String					V
ARC level	Uint8		V			
Luminaire info	String	V				
Dali Diagnostics	String	V				

Messages make use of our OAB protocol which is using the IPSO protocol.

In the following (sub) chapters, every possible object sent by the device will be discussed.

The following format will be used:

Object/Instance/Resource (dec)

Timestamp

Every message will start with a timestamp, this will make the message unique and chronologically sortable. The timestamp is a Unix timestamp in seconds.

IPSO

33255/0/5518

IP address

The current IP address of the device. Be aware that an IP address which is not fixed can change. The IP address can be read as follows:

value: 0x0A0F0A5A

IP: 10.15.10.90

IPSO

33258/0/26261

Device type

This identifies the type of the device. In case of the ZSC150 this number must be equal to 0x0037 (hex) / 55 (dec).

IPSO

33258/0/26651

Firmware version

This is the firmware version which runs on the device. The firmware version should be read like an IP address.

IPSO

33258/0/26260

IMSI

The IMSI is a unique number of a SIM card on a network and is 15 characters long. Be aware that the first two bytes of an IPSO string are equal to the string length.

IPSO

33258/0/26652

ICCID

The ICCID is the unique number of a SIM card and is 18-19 characters long.

IPSO

33258/0/26257

Modem firmware

The firmware version which is running on the modem.

IPSO

33258/0/26653

GPS firmware

The firmware version which is running on the GPS module.

IPSO

33258/1/26653

Operating hours

The number of hours the device has been active in hours.

IPSO

33258/0/26519

Send interval

The device sends data by itself on a certain interval which is determined by this value in minutes. The accepted range is between 1 and 1440 minutes.

IPSO

33258/0/26246

Time zone

The time zone which is used by the device. The default is GMT + 1.

The accepted range is between -12 and +14.

IPSO

33258/0/26657

DST

Enable or disable the day saving time. This determines the use of summer / wintertime.

IPSO

33258/0/26258

Operator code

The operator code indicates which telecommunication operator in a country is used.

IPSO

33258/0/26252

GPS location

The longitude and gratitude of the location of the device. The first 4 bytes contain the latitude (float), the last 4 bytes contain the longitude (float). The GPS location will be sent the first time the device finds a location.

IPSO

33258/0/26242

Tilt alarm

If the device is tilted due to collision for example, the device will send a tilt alarm.

The first time the device is turned on and has to calibrate, after 3 hours the alarm is enabled.

The alarm will contain the measured angle in degrees.

IPSO

33258/0/26251

Mode

The device can run in the following modes:

- 0 MAINS
- 1 ASTRO
- 2 LUX
- 3 STATIC
- 4 EMERGENCY

In mains mode the device will follow the dim planning when powered on.

In astro and lux mode the device will follow the dim planning when it is considered night. Otherwise the device will turn the LED off.

In astro mode it is considered day or night depending on the GPS location and the local time. This method is also known as astro sunrise.

In lux mode it is considered night when the lux sensor measures a value lower than 18 for 5 minutes or longer. If the sensor measures a value greater than 36 for 5 minutes or longer it is considered day.

In emergency mode the LED will be turned on (100%) for a variable amount of time (emergency duration). After the emergency mode times out, it will go back to its previous mode. Be aware that the device is stuck in emergency mode, until the mode times out.

IPSO

33258/0/26249

Ack token

When a request message contains an ACK (acknowledge) token, the device will respond with the same token. This indicates that the message is received, properly.

IPSO

33258/026672

Invalid parameter

Whenever a command is received, which results in an error (except from the set operator code command) this object will be sent. The value of the object is equal to the value of the ack token. If no ack token has been sent the value will be equal to zero.

IPSO

33258/0/26656

Device error code

Whenever the device detects a general error, the device will send the following object.

NO_ERROR_ = 0,
DALI_ERROR = 1

This message will be sent on change and on interval if the DALI_ERROR is set.

IPSO

33258/0/26663

Planning

Setting a dim planning is somewhat more complex than setting the DST for example. The first byte is equal to the number of dim steps. After the first byte an array of steps must follow. Each step contains a timestamp of 4 bytes and 4 bytes of dim values. The planning ends with a CRC (CRC-16/ARC, little endian).

A dim planning will be played once a week. The first valid timestamp is equal to Monday 5 January 1970 00:00:00. The last valid timestamp is equal to Sunday 11 January 1970 23:59:59. These values are equal to 345600 and 950399 Unix seconds. A timestamp in a dim schedule should not use a time zone, thus using UTC + 0.

The 4 bytes of dim values contain an RGBW value. The ZSC150 uses the last value only.

The CRC-16/ARC value is calculated without the number of steps byte.

Examples:

1 dim step 100% Monday 5 January 1970 00:00:00

1, 0, 5, 70, 0, 0, 0, 0, 100, 90, 77 (dec)

01 00 05 46 00 00 00 00 64 5A 4D (hex)

Complete message:

2B 00 00 00 00 00 00 00 00 00 00 00 11 00 00 11 0D 0F 00 68 26 00 0B 01 00 05 46 00 00 00 00 64 5A 4D (hex)

d/YLH000000000005Dz!y4g-CLciazO00L*(0001ft1[(ascii85)

1 dim step 0% Monday 5 January 1970 00:00:00 and

1 dim step 100% Sunday 11 January 1970 23:59:59

2, 0, 5, 70, 0, 0, 0, 0, 0, 0, 14, 128, 127, 0, 0, 0, 100, 102, 164 (dec)

02 00 05 46 00 00 00 00 00 00 0E 80 7F 00 00 00 64 66 A4 (hex)

Complete message:

2B 00 00 00 00 00 00 00 00 00 00 00 11 00 00 1A 0D 0F 00 68 26 00 13 02 00 05 46 00 00 00 00 00 00 0E 80 7F 00 00 00 64 66 A4 (hex)

d/YLH000000000005Dz!H4g-CLciaXX00L*(0000001KKe0001fw#2 (ascii85)

IPSO

3343/0/26662

Exceptions

Unlike the dim planning steps, exception steps occur once in a while. An exception step consists of three more bytes which indicate the duration in minutes (2 bytes) and whether the step must reoccur or not.

The first byte is equal to the number of dim steps. After the first byte an array of steps must follow. Each step contains a timestamp of 4 bytes, 4 bytes of dim values, 2 bytes for indicating duration and 1 byte to indicate reoccurrence. The planning ends with a CRC (CRC-16/ARC).

An exception step can reoccur every month or every year. In case of a selected day which does not occur every month (31e) or every year (leap year), the month or year will be skipped. New steps with a Unix timestamp which is older than one month will not be handled.

Example:

An exception step which must take place at January 31 and must reoccur every month will not be executed in the months February, April, June, August, October and December. February the 29 will only occur every 4 years (unless the year is dividable by 100).

Examples:

1 dim step 100% 19 March 2021 23:00:00 for 10 minutes only once
1, 96, 85, 44, 240, 0, 0, 0, 100, 0, 10, 0, 55, 69 (dec)
0160552cf000000064000a003745 (hex)

Complete message:

2B 00 00 00 00 00 00 00 00 00 00 00 00 11 00 00 15 0D 0F 01 68 26 00 0E 01 60 55 2c f0 00 00
00 64 00 0a 00 37 45 (hex)

d/YLH00000000005Dz!C4g-FMcialRu@X=E0001f015Y+mf (ascii85)

1 dim step 10% 6 June 2021 10:00:00 for 2 hours reoccur every month
1, 96, 188, 156, 160, 0, 0, 0, 10, 0, 120, 1, 42, 79 (dec)
0160bc9ca00000000a0078012a4f (hex)

Complete message:

2B 00 00 00 00 00 00 00 00 00 00 00 00 11 00 00 15 0D 0F 01 68 26 00 0E 01 60 bc 9c a0 00 00
00 0a 00 78 01 2a 4f (hex)

d/YLH00000000005Dz!C4g-FMcialRv7-250000a0c!!]px (ascii85)

1 dim step 25% 12 April 2021 12:51:22 for 20 hours reoccur every year

1, 96, 116, 66, 74, 0, 0, 0, 25, 4, 176, 2, 163, 143 (dec)

016074424a0000001904b002a38f (hex)

Complete message:

2B 00 00 00 00 00 00 00 00 00 00 00 11 00 00 15 0D 0F 01 68 26 00 0E 01 60 74 42 4a 00 00
00 19 04 b0 02 a3 8f (hex)

d/YLH00000000005Dz!C4g-FMcialRv01.c0000p1H4%5J@ (ascii85)

IPSO

3343/1/26662

Emergency duration

This value is only used in emergency mode and determines for how long the ZSC150 will be in emergency mode. Be aware that this value must be set before switching to emergency mode. The duration is in seconds and the default duration is equal to 3600 seconds.

IPSO

3343/0/26671

Static dim level

This value is only used in static mode and determines which dim level the ZSC150 will use. The ZSC150 will use a dim level of 100% (on) as default.

IPSO

3343/0/26668

Error code (DALI)

The DALI SR error code from bank 124 address 12 (2 byte).

actual diagnostics status of the driver

bit0: Short circuit

bit 1: Open Circuit

bit 2: ModuleNTCMissing

bit 3:

ModuleLightReductionActive

bit 4: ModuleTempTooHigh

bit 5: MainsTooHigh

bit 6: MainsTooLow

bit 7: StartFadeupActive

bit 8:

DriverLightReductionActive

bit 9 - bit 15: Reserved

IPSO

33268/0/26663

Driver firmware version (DALI)

The firmware which runs on the DALI SR driver from bank 0 address 9 (2 bytes).

IPSO

33268/0/26260

Operating hours (DALI)

The time in hours the DALI SR driver has been running from bank 123 address 6 (4 bytes).

The ZSC150 divides the retrieved value by 3600.

IPSO

33268/0/26519

Temperature (DALI)

The temperature of the LED driver from bank 124 address 8 (Celsius = value - 55).

IPSO

33268/0/26664

Voltage (DALI)

The LED voltage from bank 124 address 4 (Volt).

IPSO

33268/0/27002

Current (DALI)

The LED current from bank 124 address 6 (mA).

IPSO

33268/0/26666

Energy

The total active energy consumed from bank 68 address 4 (W).

The energy unit from bank 68 address 16 is used to calculate the total active energy value.

IPSO

33268/0/26667

ARC level (DALI)

The DALI ARC level indicates the dim level of the light. This value is in percentages (%).

IPSO

33268/0/26668

Power

The DALI active power level from bank 68 address 17(W).

The value must be multiplied by 10 power(power unit).

IPSO

33268/0/27004

Power unit

The DALI power unit from bank 68 address 16(expressed as power of 10).

This value will be sent with the DALI power.

IPSO

33268/0/27001

Luminaire info (DALI)

The luminaire info contains all information from bank 1.

IPSO

33268/0/26669

DALI Diagnostics

DALI Diagnostic information can be requested from bank 1, 202, 203, 204, 205, 206 and 207. The response of each bank is a byte array containing the full bank information as shown in the tables below.

Memory Bank 1 – Device Information

IPSO

33268/1/26669

Address	Description	Type	Notes
0x03 - 0x08	Luminaire manufacturer GTIN with manufacturer specific prefix to derive manufacturer name	Byte array	
0x09 - 0x10	Luminaire identification number	Byte array	
0x11 - 0x12	Content Format ID	UInt16	Should be 0x0004
0x13	Luminaire year of manufacture [99] [0,99] = YY	UInt8	Year 20xx
0x14	Luminaire week of manufacture [WW] [1,53] = WW	UInt8	Week Number
0x15 - 0x16	Nominal Input Power [W] (MSB)	UInt16	Watts
0x17 - 0x18	Power at minimum dim level [W] (MSB)	UInt16	Watts
0x19 - 0x1A	Nominal Minimum AC mains voltage [V]	UInt16	Voltage
0x1B - 0x1C	Nominal Maximum AC mains voltage [V]	UInt16	Voltage
0x1D - 0x1F	Nominal light output [Lm]	UInt24	Lumen
0x20	CRI [0,100]	UInt8	
0x21 - 0x22	CCT [K] [0, 17000]	UInt16	Kelvin
0x23	Light Distribution Type;	UInt8	
0x24 - 0x3B	Luminaire color	String	24 bytes Ascii string
0x3C - 0x77	Luminaire identification	String	60 bytes Ascii string

Memory Bank 202 – Active Energy and Power (mandatory)

IPSO

33268/2/26669

Address	Description	Type	Notes
0x03	Version of the memory bank	UInt8	
0x04	Scale Factor For Active Energy	Int8	Defines scale of Active Energy (0x05...)

0x05 – 0x0A	Active Energy	Uint48	Watt/hour
0x0B	Scale Factor For Active Power	Int8	Defines scale of Active Power (0x0C...)
0x0C – 0x0F	Active Power	Uint32	Volt

Memory Bank 203, Apparent Energy & Power (optional)

IPSO

33268/3/26669

Address	Description	Type	Notes
0x03	Version of the memory bank	Uint8	
0x04	Scale Factor for apparent Energy	Int8	Defines scale of Apparent Energy (0x05...)
0x05 -0x0A	Apparent Energy	Uint48	Watt/Hour
0x0B	Scale Factor For Apparent Power	Int8	Defines scale of Apparent Power (0x0C...)
0x0C – 0x0F	Apparent Power	Uint32	Watt

Memory Bank 204, Load side Energy & Power (optional)

IPSO

33268/4/26669

Address	Description	Value	Notes
0x03	Version of the memory bank	Uint8	
0x04	Scale Factor for Load side Energy	Int8	No change
0x05 – 0x0A	Active Energy Load side	Uint48	No change
0x0B	Scale Factor for Load side Power	Int8	No change
0x0C – 0x0F	Active Power Load side	Uint32	No change

Memory Bank 205 – Control Gear Diagnostics and Maintenance (Mandatory)

IPSO

33268/5/26669

Address	Description	Value	Notes
0x03	Version of the memory bank	Uint8	No change
0x04 – 0x07	Control Gear Operating Time	Uint32	Seconds

0x08 – 0x0A	Control Gear Start Counter	Uint24	Nr of Power Cycles
0x0B – 0x0C	Control Gear External Supply Voltage	Uint16	0.1 Volts
0x0D	Control Gear External Supply Voltage Frequency	Uint8	1 Hz
0x0E	Control Gear Power Factor Range of validity: [0,100]	Uint8	0.01 Power Factor
0x0F	Control Gear Overall Failure Condition Range of validity: [0,1]	Bool	
0x10	Control Gear Overall Failure Condition Counter Range of validity: [0,0xFD]	Uint8	
0x11	Control Gear External Supply Undervoltage Range of validity: [0,1]	Bool	
0x12	Control Gear External Supply Undervoltage Counter Range of validity: [0,0xFD]	Uint8	
0x13	Control Gear External Supply Overvoltage Range of validity: [0,1]	bool	
0x14	Control Gear External Supply Overvoltage Counter Range of validity: [0,0xFD]	Uint8	
0x15	Control Gear Output Power Limitation Range of validity: [0,1]	bool	
0x16	Control Gear Output Power Limitation Counter Range of validity: [0,0xFD]	0x00	
0x17	Control Gear Thermal Derating Range of validity: [0,1]	bool	
0x18	Control Gear Thermal Derating Counter Range of validity: [0,0xFD], TM	Uint8	
0x19	Control Gear Thermal Shutdown Range of validity: [0,1]	Bool	
0x1A	Control Gear Thermal Shutdown Counter Range of validity: [0,0xFD]	Uint8	
0x1B	Control Gear Temperature Range of validity: [0,0xFD] Offset value: -60 Example: A value of 0 means – 60 °C. A value of 60 means 0 °C	Uint8	1 °C
0x1C	Control Gear Output Current Percent Range of validity: [0,100]	Uint8	%

Memory Bank 206, Light Source Diagnostics and Maintenance

IPSO

33268/6/26669

Address	Description	Value	Notes
0x03	Version of the memory bank	UInt8	
0x04 – 0x06	Light Source Start Counter Resettable	UInt24	
0x07 – 0x09	Light Source Start Counter	UInt24	
0x0A – 0x0D	Light Source On Time Resettable	UInt32	Seconds
0x0E – 0x11	Light Source On Time	UInt32	
0x12 – 0x13	Light Source Voltage	UInt16	0.1 V
0x14 – 0x15	Light Source Current	UInt16	0.001 A
0x16	Light Source Overall Failure Condition Range of validity: [0,1]	Bool	
0x17	Light Source Overall Failure Condition Counter Range of validity: [0,0xFD]	UInt8	
0x18	Light Source Short Circuit Range of validity: [0,1]	Bool	
0x19	Light Source Short Circuit Counter Range of validity: [0,0xFD]	UInt8	
0x1A	Light Source Open Circuit Range of validity: [0,1]	Bool	
0x1B	Light Source Open Circuit Counter Range of validity: [0,0xFD]	UInt8	
0x1C	Light Source Thermal rating Range of validity: [0,1]	Bool	
0x1D	Light Source Thermal Derating Counter Range of validity: [0,0xFD]	UInt8	
0x1E	Light Source Thermal Shutdown Range of validity: [0,1]	Bool	
0x1F	Light Source Thermal Shutdown Counter Range of validity: [0,0xFD]	UInt8	
0x20	Light Source Temperature Range of validity: [0,0xFD] Offset value: -60 Example: A value of 0 means – 60 °C. A value of 60 means 0 °C	UInt8	1 °C

Memory Bank 207, Luminaire Maintenance Data (mandatory)

IPSO

33268/7/26669

Address	Description	Value	Notes
0x03	Version of the memory bank	UInt8	No change
0x04	Rated Median Useful Life Of Luminaire Range of validity: [0,0xFD] NOTE A value of 50 means 50000 h.	UInt8	1000 Hours
0x05	Internal Control Gear Reference Temperature Range of validity: [0,0xFD] Offset value: -60 MASK = unknown. NOTE Example: A value of 60 means 0 °C, a value of 0 means – 60 °C.	UInt8	1 °C
0x06 – 0x07	Rated Median Useful Light Source Starts Range of validity: [0,0xFF FD] NOTE Example: A value of 5000 means 500000 starts	UInt16	X100

Request API.

Data can be sent to the following API URL:

<https://oab-api.azurewebsites.net/api/oab-api?id=00112233445566778899AABB>

The Id is the unique device id. The unique id is a hex string, must be 12 bytes long and must be upper case. Every device subscribes on their own unique device id.

The API expects a POST request with the Content-Type header set to JSON/Application. This API accepts commands in combination with a value instead of IPSO objects.

It is also possible to combine commands. This can be done by simply appending commands to the json package.

In the following cases an IPSO object will be described as:

Object_ID/Instance_ID/Resource_ID

IPSO objects with the value type string, starts with 2 bytes containing the string length.

No types on the other hand do not expect any value.

Be aware that the API adds an OAB header to the commands and encodes it with an Z85 (ASCII85 / Base85 encoding version) encoding .

The device will subscribe to the following MQTT topic:

rtm/zsc150/down/<STM ID>

Description	IPSO	Command	Type
REQUEST:			
ACK token	33258/0/26672	ACK_TOKEN	UInt32
OTA	33269/0/26260	OTA	UInt32
Device type	33258/0/26670	REQUEST_DEVICE_TYPE	No type
GPS location	33258/1/26670	REQUEST_LOCATION	No type
Time zone	33258/2/26670	REQUEST_TIME_ZONE	No type
DST	33258/3/26670	REQUEST_DST	No type
GPS firmware	33258/4/26670	REQUEST_GPS_FIRMWARE	No type
Device operating hours	33258/5/26670	REQUEST_OPERATING_HOURS	No type
IP address	33258/6/26670	REQUEST_IP_ADDRESS	No Type
ICCID	33258/7/26670	REQUEST_ICCID	No type
Send interval	33258/8/26670	REQUEST_SEND_INTERVAL	No type
IMSI	33258/9/26670	REQUEST_IMSI	No type
Modem firmware	33258/10/26670	REQUEST_MODEM_FIRMWARE	No type
Device firmware	33258/11/26670	REQUEST_DEVICE_FIRMWARE	No type
Device mode	33258/12/26670	REQUEST_DEVICE_MODE	No type
Operator code	33258/13/26670	REQUEST_OPERATOR_CODE	No type
Dim planning	3343/0/26670	REQUEST_DIM_PLANNING	No type
Dim exceptions	3343/3/26670	REQUEST_DIM_EXCEPTIONS	No type
Emergency duration	3343/1/26670	REQUEST_EMERGENCY_DURATION	No type
Static dim level	3343/2/26670	REQUEST_DIM_LEVEL	No type
DALI firmware	33268/0/26670	REQUEST_DALI_FIRMWARE	No type
DALI temperature	33268/1/26670	REQUEST_DALI_TEMPERATURE	No type
DALI voltage	33268/2/26670	REQUEST_DALI_VOLTAGE	No type
DALI current	33268/3/26670	REQUEST_DALI_CURRENT	No Type
DALI luminaire info	33268/4/26670	REQUEST_DALI_LUMINAIRE_INFO	No Type
DALI diagnostics bank 1	33268/6/26670	REQUEST_DALI_BANK_1	No Type
DALI diagnostics bank 202	33268/7/26670	REQUEST_DALI_BANK_202	No Type
DALI diagnostics bank 203	33268/8/26670	REQUEST_DALI_BANK_203	No Type
DALI diagnostics bank 204	33268/9/26670	REQUEST_DALI_BANK_204	No Type
DALI diagnostics bank 205	33268/10/26670	REQUEST_DALI_BANK_205	No Type
DALI diagnostics bank 206	33268/11/26670	REQUEST_DALI_BANK_206	No Type
DALI diagnostics bank 207	33268/12/26670	REQUEST_DALI_BANK_207	No Type
SET:			
Send interval	33258/0/26246	SET_SEND_INTERVAL	UInt32
Time zone	33258/0/26657	SET_TIME_ZONE	Int8
DST	33258/0/26659	SET_DST	Boolean
Device mode	33258/0/26249	SET_DEVICE_MODE	UInt8
Operator code	33258/0/26252	SET_OPERATOR_CODE	UInt32
Dim planning	3343/0/26662	SET_DIM_PLANNING	String
Dim exceptions	3343/1/26662	SET_DIM_EXCEPTIONS	String
Emergency duration	3343/0/26671	SET_EMERGENCY_DURATION	UInt32
Static dim level	3343/0/26668	SET_DIM_DIRECT_LEVEL	UInt8

In the following example the device type and DALI firmware are requested and the daylight saving time, time zone and the send interval are set.

```
{
  ...."REQUEST_DEVICE_TYPE": "-",
  ...."REQUEST_DALI_FIRMWARE": "-",
  ...."SET_DST": true,
  ...."SET_TIMEZONE": -8,
  ...."SET_SEND_INTERVAL": 120
}
```

Requested values will be sent through the push API (chapter Push Data). It's recommended to add the ACK token when setting data. This will indicate if the message is properly received by the device. Whenever a set action fails (e.g., out of range) the device will send an invalid parameter object as response.

OTA

This command will trigger a firmware over the air update. The device will try to connect to an FTPT server. When the device is able to connect to the server the device will search to the file "ZSC150_X". X is the firmware version and should be equal to the variable given with the OTA command.

Example:

```
{
  "OTA": 1101
}
```

File name: ZSC150_1101

DST / Mode

See the chapters in the Push Data chapter.

Dim planning / Dim exceptions

Requesting the dim planning list and the exception list is not possible in the same call.

Send interval

The minimum value is 1 minute and the maximum value is 1440 minutes (once a day).

Time zone

The time zone in hours. The minimum value is -12 and the maximum value is 14.

Static dim level

In static mode the dim level can be set. This value is a percentage (0-100).

Operator code

After receiving a new preferred operator code, the device will try to connect with the operator code. If the device is not able to connect with the new operator code, the operator code will be discarded.

The device needs to reset its connection to test the new operator code. This will take some time. After the device subscribes to a topic again, new commands can be sent.

Emergency duration

In emergency mode the dim value is set to 100% (brightest level) for a variable number of seconds. The value to be sent is the duration in seconds. This command should be sent before switching to emergency mode. Otherwise, the mode will use the old duration value. The minimum value is one second and the maximum is 86400 seconds (1 day).

Version management

V 1.0 – First draft.	Sam Michielsen	22-02-2021
V 1.1 – Changed check marks in push API.	Sam Michielsen	22-02-2021
V 1.2 – Updated after FRS update	Sam Michielsen	03-03-2021
V 1.3 – Added invalid parameter, ICCID and set operator code.	Sam Michielsen	05-03-2021
V 1.4 – Extended dim planning explanation	Sam Michielsen	11-03-2021
V 1.5 – Added Exceptions, DALI voltage and DALI power	Sam Michielsen	16-04-2021
V 1.6 – Changed GPS send interval to boot	Sam Michielsen	25-10-2021
V 1.7 – Added device error code	Sam Michielsen	06-04-2021
V 1.8 – Fixed wrong resource code for Invalid parameter	Sam Michielsen	16-06-2022
V 1.9 – Add DALI diagnostics commands	Frank	17-01-2023
V 1.10 – Updated dim planning endianness	Sam Michielsen	17-10-2023