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Smart Plug Mini 2 - SPLZB-14x

Technical manual

Revised 29.08.2025

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RoHS CE

1 Cautionary notes

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2 Features

2.1 Smart Plug Mini 2 - SPLZB-14x

The wireless Smart Plug Mini with power metering feature is an intelligent, sharp and sophisticated, remotely controlled adapter.
This extremely efficient Smart Plug Mini can be applied wherever you want to control electrical devices, while monitoring the power consumption in a convenient and maintenance-free way.
The Smart Plug Mini requires no installation tools or electrician, meaning no hassle for you. You just take the Smart Plug Mini out of the box, put it into an electrical outlet, and plug in any electrical device of your choice.
The Smart Plug Mini allows you to instantly turn on and off any device from across the world - or from your living room. The undemanding interface ensures an easy and intuitive way of adding the Smart Plug Mini to your Smart Home system.
The Smart Plug Mini is based on ZigBee and can easily be integrated with other ZigBee products or smart control solutions.

2.2 Key features

The ZigBee based relay for Smart Plug Mini mounting is router in the ZigBee network.
Key features are:

- Remote on/off control
- Power Failure alarm
- Accurate power consumption meter
- Certified ZigBee 3.0
- ZigBee OTA cluster for firmware upgrades
- CE/RED compliant.

3 Endpoints

The device has 3 endpoints:

3.1 ZigBee Device Object (ZDO)

- Application profile Id 0x0000
- Application device Id 0x0000
- Supports all mandatory clusters

3.2 Smart Plug Mini – End Point 0x02

- Application profile Id 0x0104 (Home Automation)
- Application device Id 0x0051 (Smart Plug Mini)
- Clusters
    - Clusters supported as server
        - Basic
        - Identify
        - Groups
        - Scenes
        - On Off
        - Metering
        - Alarms (support alarms in relation to the Metering cluster)
        - Device Temperature Configuration
        - Electrical Measurement
    - Clusters supported as client
        - Occupancy Sensing
        - OTA Upgrade
        - Time

3.3 Onics Utility

- Application profile Id 0xC0C9 (Onics (Formerly Develco Products) private profile)
- Application device Id 0x0001
- Onics (Formerly Develco Products) ZigBee Manufacturer code 0x1015
- Private profile for internal Onics (Formerly Develco Products) use only.

3.4 Basic – Cluster id 0x0000

The Basic cluster has 2 attribute sets defined. In the following sections the attributes of these sets is listed. Refer to ZigBee specification of the basic cluster.

Only the first set has mandatory attributes, also the optional attributes that can be relevant to a device are all in set 0x000

3.4.1 0x000 Basic Device Information attribute set

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x00	ZCLVersion	Uint8	Type range	M	
0x04	ManufacturerName	String	0-32 byte	O	
0x05	ModelIdentifier	String	0-32 byte	O	
0x06	DataCode	String	0-16 byte	O	
0x07	PowerSource	8 bit enum	Type range	M	

3.4.1.1 Manufacturer name

“Onics” (Formerly “Develco Products A/S”)

3.4.1.2 Model identifier

“SPLZB-14x”

3.4.1.3 Power source

Mains powered single phase

3.4.1.4 Manufacture Specific Attribute

Id#	Name	Type	Relevance and ref.
0x8000	Primary SW Version	OctetString	Read only
0x8010	Primary Bootloader SW Version	OctetString	Read only
0x8020	Primary HW version	OctetString	Read only
0x8030	Primary HW name	OctetString	Read only
0x8050	Primary SW Version 3rd Party	OctetString	Read only
0x8100	Led Control	BitMap8	Turn off/on MMI led

ZCL header setting – Manufacturer code for Onics (Formerly Develco Products) is 0x1015

3.5 Device Temperature – Cluster id 0x0002

The device will use this clusters as a server – provided a temperature from the sensor in the Smart Plug Mini.

3.5.1 Attribute

Id#	Name	Type	Range	Man /Opt	Relevance and ref.
0x0000	Current temperature	Analog (Uint16)	Temperature in Celsius degrees.	M	Resolution 1 °C

3.6 Identify – Cluster id 0x0003

The identify cluster serves as a way to make a device identify itself either visually or by sound.
Normally this is done by toggling an LED at some interval.
Refer to ZigBee specification of the identify cluster.
The Identify cluster only defines one attribute.

3.6.1 Attribute

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0000	IdentifyTime	Uint16	Type range	M	

3.6.1.1 Commands

The identify cluster has 2 commands as server.

Id#	Name	Payload	Man/Opt	Relevance and ref.
0x00	Identify	Uint16 - Identify Time (seconds)	M	
0x01	Identify Query	None	M	

The identify cluster has 1 command as client.

Id#	Name	Payload	Man/Opt	Relevance and ref.
0x00	Identify Query Response	Uint16 - Identify Time (seconds)	M	

3.7 On/Off – Cluster id 0x0006

The On/Off cluster has 1 attribute set defined. In the following section the set is listed. Refer to ZigBee specification of the On/Off Cluster. The cluster is implemented as a server cluster.

3.7.1 On/Off Cluster - Attributes

On the On/Off cluster the following attributes are defined:

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x0000	OnOff	Boolean	0x00 – 0x01	M	Section 3.8.2.2 ZCL configure reporting is supported

3.7.2 On/Off Cluster Commands

The server generates no commands

The On/Off cluster can receive the following commands from a client

Id#	Name	Man/Opt	Relevance and ref.
0x00	Off	M	ZCL specification section 3.8.2.3
0x01	On	M	ZCL specification section 3.8.2.3
0x02	Toggle	M	ZCL specification section 3.8.2.3
0x40	OffWithEffect	O	ZCL specification section 3.8.2.3

3.7.3 On/Off Cluster – MFG Commands

The On/Off cluster can receive the following manufacture specific commands from a client

Id#	Name	Man/Opt	Relevance and ref.
0x00	Safe mode Off	O	0x00
0x01	Safe mode On	O	0x01

ZCL header setting – Manufacture code for Onics (Formerly Develco Products) is 0x1015

3.7.3.1 Overview

The safe mode functionality is default disabled. To enable the safe mode functionality the Safe mode On or Off command has to be send from the client with payload 1 – 255. To disable the safe mode the client has to send a payload with value 0. The safe mode functionality is implemented to **assure** that the relay enters a predefined state after x minutes.

If "Safe mode On" command is sent to a relay with value 10 minutes, the relay will enter the safe mode after 10 minutes and force the relay to turn **ON**. If a standard **OFF** command from the On/Off cluster is sent within the first 10 minutes. The timer is restarted and the relay will not turn ON before the new 10 minute time has timed out. Sending the standard **OFF** command regularly within the 10 minute time interval will prevent the relay to enter safe mode **ON** state.

The "Safe mode off" functionality is the same as "Safe mode on" the only different is relay entering off state instead of on state.

After a power failure the remaining time before entering "Safe mode" is set to zero and the device will be forced to enter safe mode immediately.

3.7.3.2 Safe mode Off payload

Octets	1
Data type	Uint8
Field name	SafeModeTime in minute

3.7.3.3 Safe mode On payload

Octets	1
Data type	Uint8
Field name	SafeModeTime in minute

3.8 Occupancy Sensing Client – Cluster id 0x0406

It is possible to bind up to 4 occupancy sensors to the SmartPlug. If any of the received states are occupied, the SmartPlug will turn on. If all of the received states are unoccupied, the SmartPlug will turn off.
If the SmartPlug does not receive a report from one of the occupancy sensors for 30min, the stored state will time out, and the state will be set based on the remaining active sensor states, if any.

3.9 Metering – Cluster id 0x0702

In the following sections the ZigBee SE metering cluster, is listed. Refer to ZigBee specification of the Metering cluster.

3.9.1 0x00 Reading Information attribute set

Id#	Name	Type	Range	SE Req.	Relevance and ref.
0x00	CurrentSummationDelivered	Uint48	Type range	M	Recent summed value of Energy delivered.
0x02	CurrentMaxDemandDelivered	Uint48	Type range	O	The value is reset at midnight UTC time
0x08	CurrentMaxDemandDelivered Time	UTC Time	Type range	O	Represents the time when *CurrentMaxDemandDelivered* was captured
0x0F	ProfileIntervalPeriod	8-bit Enum	0x00-0xFF	O	Log is stored in a 5 min interval

Above attribute description is to be found in section D.3.2.2.1 “Reading Information Set” document “Zigbee Smart Energy Standard” provided by the Connectivity Standards Alliance.

3.9.2 0x01 TOU Information attribute set

No attributes are support in this set.

3.9.3 0x02 Meter Status attribute set

Id#	Name	Type	Range	Man/Opt	Relevance and ref.
0x00	Status	8 bit bitmap	Type range	M	0x0032 – Meter Status

Above attribute description is to be found in section D.3.2.2.3 “Meter Status Attribute” document “Zigbee Smart Energy Standard” provided by the Connectivity Standards Alliance.

3.9.3.1 Meter Status

The following table describe the meter status bits per metering type:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Reserved	Service Disconnect Open	Leak Detect	Power Quality	Power Failure	Tamper Detect	Low Battery	Check Meter

3.9.4 0x03 Formatting attribute set

The following set of attributes provides the ratios and formatting hints required to transform the received summations, consumptions or demands/rates into displayable values. If the Multiplier and Divisor attribute values are non-zero, they are used in conjunction with the *SummationFormatting*, *ConsumptionFormatting*, and *DemandFormatting* attributes. Equations required to accomplish this task are defined below:

Summation = Summation received * Multiplier / Divisor
(formatted using *SummationFormatting*)

Consumption = Summation received * Multiplier / Divisor
(formatted using *ConsumptionFormatting*)

Demand = Demand received * Multiplier / Divisor
(formatted using *DemandFormatting*)

If the Multiplier and Divisor attribute values are zero, just the formatting hints defined in *SummationFormatting*, *ConsumptionFormatting*, and *DemandFormatting* attributes are used.

The following set of attributes provides the ratios and formatting hints required to transform the received summations, consumptions or demands/rates into displayable values. If the Multiplier and Divisor attribute values are non-zero, they are used in conjunction with the *SummationFormatting*, *ConsumptionFormatting*, and *DemandFormatting* attributes.

Id#	Name	Type	Range	Man /Opt	Relevance and ref.
0x00	UnitofMeasure	8 bit enum	0x00 to 0xFF	M	Fixed to 0x00 (kW/kWh in pure binary format)
0x01	Multiplier	Uint24	0x000000 to 0xFFFFFF	O	Fixed to 1
0x02	Divisor	Uint24	0x000000 to 0xFFFFFF	O	Fixed to 1000
0x03	SummationFormatting	8 bit bitmap	0x00 to 0xFF	M	Fixed to 0xF8 (0 digits to the right of the decimal point)
0x04	DemandFormatting	8 bit bitmap	0x00 to 0xFF	O	Fixed to 0xF8 (0 digits to the right of the decimal point)
0x06	MeteringDeviceType	8 bit bitmap	0x00 to 0xFF	M	Fixed to 0x00 (Electric Meter)
0x08	MeterSerialNumber	Octet String	0-24 Octets	O	

Above attribute description is to be found in section D.3.2.2.4 “Formatting” document “Zigbee Smart Energy Standard” provided by the Connectivity Standards Alliance.

3.9.5 0x04 Historical attribute set

Id#	Name	Type	Range	Man /Opt	Relevance and ref.
0x00	InstantaneousDemand	Int24	-8,388,607 to 8,388,607	O	

Above attribute description is to be found in section D.3.2.2.5 “Historical Consumption” document “Zigbee Smart Energy Standard” provided by the Connectivity Standards Alliance.

3.10 Alarms – Cluster id 0x0009

The Alarms cluster has 1 attribute set defined. In the following section the set is listed. Refer to ZigBee specification of the Alarm Cluster. The cluster is implemented as a server cluster.

3.10.1 Metering Cluster - Alarm Attribute Set 0x000

On the metering cluster another attribute set related to alarms is defined:

3.10.2 Alarms Cluster Commands

The Alarm Server cluster can receive the following commands

Id#	Name	Man /Opt	Relevance and ref.
0x00	Reset Alarm	M	ZCL specification section 3.11
0x01	Reset all alarm	M	ZCL specification section 3.11

The Alarm Server cluster can generate the following commands

Id#	Name	Man /Opt	Relevance and ref.
0x00	Alarm	M	ZCL specification section 3.11

The metering device is able to generate ZCL alarms for various meter events. A binding between the receiving end point of the alarms and the meter end points alarm cluster must have been created before the alarms can be reported. Only mandatory commands are supported.
The following alarms are supported.

3.10.2.1 Alarm code table

ZCL Alarm Code decimal	ZCL Alarm Condition
0x03	Power Failure

3.11 Time – Cluster id 0x000A

The Time cluster is a general cluster for time it is based on a UTC time in seconds since 0 hrs 0 mins 0 sec on 1st January 2000. Refer to ZigBee specification of the time cluster.

The metering device will use this clusters as a client – provided that a suitable Time Server is available on the network (most likely on the Gateway/concentrator)

3.11.1 Attribute

Id#	Name	Type	Range	Man /Opt	Relevance and ref.
0x0000	Time	UTCTime (Uint32)	Type range	M	The module will periodically update its clock by synchronizing through this cluster
0x0001	TimeStatus	8 bit bitmap	00000xxx	M	
0x0002	TimeZone	Uint32	Type range	O	
0x0003	DstStart	Uint32	Type range	O	
0x0004	DstEnd	Int32	Type range	O	
0x0005	DstShift	Uint32	Type range	O	

3.12 Groups – Cluster 0x0004

The Group cluster has 1 attribute set defined. In the following section the set is listed. Refer to specification of the Groups Cluster. The cluster is implemented as a server cluster.

3.12.1 Groups Cluster - Attributes

On the groups cluster the following attributes are defined:

Id#	Name	Type	Range	Man /Opt	Relevance and ref.
0x0000	NameSupport	8bitmap	Type range	M	Section 3.6.2.2

3.12.2Groups Cluster Commands

The groups cluster can receive the following commands from the client.

Id#	Name	Man /Opt	Relevance and ref.
0x00	Add group response	M	ZCL specification section 3.6.2.3
0x01	View group response	M	ZCL specification section 3.6.2.3
0x02	Get group membership response	M	ZCL specification section 3.6.2.3
0x03	Remove group response	M	ZCL specification section 3.6.2.3

The groups cluster can generate the following command and send them to the client.

Id#	Name	Man /Opt	Relevance and ref.
0x00	Add group	M	ZCL specification section 3.6.2.2
0x01	View group	M	ZCL specification section 3.6.2.2
0x02	Get group membership	M	ZCL specification section 3.6.2.2
0x03	Remove group	M	ZCL specification section 3.6.2.2
0x04	Remove all groups	M	ZCL specification section 3.6.2.2
0x05	Add group if identifying	M	ZCL specification section 3.6.2.2

3.13 Scenes – Cluster id 0x0005

The Scenes cluster has the following attribute sets defined. In the following sections the attributes of these sets is listed. Refer to ZigBee specification of the Scenes cluster.

3.13.1 0x00 Scenes attribute set

Id#	Name	Type	Range	Man /Opt	Note
0x00	Scene Count	Uint8	Type range	M	
0x01	CurrentScene	Uint8	Type range	M	

0x02	CurrentGroup	Uint16	Type range	M	
0x03	SceneValid	Bool	Type range	M	
0x04	NameSupport	Bitmap8	Type range	M	

3.14 Electrical Measurement – Cluster id 0x0B04

The physical meter located on end point 0x02 support the electrical measurement cluster. This cluster provides a mechanism for querying data about the electrical properties as measured by the device.

Id#	Name	Type	Man /Opt	Relevance and ref.
0x0000	MeasurementType	BitMap32	O	Section 4.6.1
0x0300	ACFrequency	Uint16	O	Non phase specific Measurement Reading in (Hz).
0x0400	ACFrequencyMultiplier	Uint16	O	Fixed to 1
0x0401	ACFrequencyDivisor	Uint16	O	Fixed to 1000
0x0505	RMSVoltage	Uint16	O	L1 - Volts (V)
0x0506	RMSVoltageMin	Uint16	O	L1 - Volts (V) Minimum
0x0507	RMSVoltageMax	Uint16	O	L1 - Volts (V) Maximum
0x0508	RMSCurrent	Uint16	O	L1 - Amps (A)
0x0509	RMSCurrentMin	Uint16	O	L1 - Amps (A) Minimum
0x050A	RMSCurrentMax	Uint16	O	L1 - Amps (A) Maximum
0x050B	ActivePower	Int16	O	L1 - Watts (W).
0x050E	ReactivePower	Int16	O	L1 - Watts (W).
0x0600	ACVoltageMultiplier	Uint16	O	Fixed to 1
0x0601	ACVoltageDivisor	Uint16	O	Fixed to 100
0x0602	ACCurrentMultiplier	Uint16	O	Fixed to 1
0x0603	ACCurrentDivisor	Uint16	O	Fixed to 1000
0x0604	ACPowerMultiplier	Uint16	O	Fixed to 1
0x0605	ACPowerDivisor	Uint16	O	Fixed to 1

3.14.1 Measurement type

Indicates a device's measurement capabilities

Bit	Flag name
0	Active measurement (AC)
1	Reactive measurement (AC)
2	Apparent measurement (AC)
3	Phase A measurement
4	Phase B measurement
5	Phase C measurement
6	DC measurement
7	Harmonics measurement
8	Power quality measurement

3.14.2 MeasuredPhase1stHarmonicCurrent

The *MeasuredPhase1stHarmonicCurrent* attributes represent the most recent phase of the 1st harmonic current reading in an AC frequency. The unit for this measurement is 10 ^ *Phase1sthHarmonicCurrentMultiplier* degree

3.15 OTA Upgrade – Cluster id 0x0019

The cluster provides a ZigBee standard way to upgrade devices in the network via OTA messages.

3.15.1 OTA Cluster Attributes

Id#	Name	Type	Range	Man /Opt	Relevance and ref.
0x0000	UpgradeServerID	IEEE Address	-	M	
0x0001	FileOffset	Uint32	Type range	O	
0x0002	CurrentFileVersion	Uint32	Type range	O	
0x0003	CurrentZigBeeStackVersion	Uint16	Type range	O	
0x0004	DownloadedFileVersion	Uint32	Type range	O	

0x0005	DownloadedZigBeeStackVersion	Uint16	Type range	M	
0x0006	ImageUpgradeStatus	8 bit enum	0x00 to 0xFF	O	
0x0007	Manufacturer ID	Uint16	Type range	O	
0x0008	Image Type ID	Uint16	Type range	O	
0x0009	MinimumBlockRequestDelay	Uint16	Type range	O	

Above attribute description is to be found in section 6.7 “OTA Cluster Attributes” in ZigBee document – “Zigbee Cluster Library Specification Rx Zigbee Cluster Library OTA Cluster (0x0019) Test Specification” provided by the Connectivity Standards Alliance.

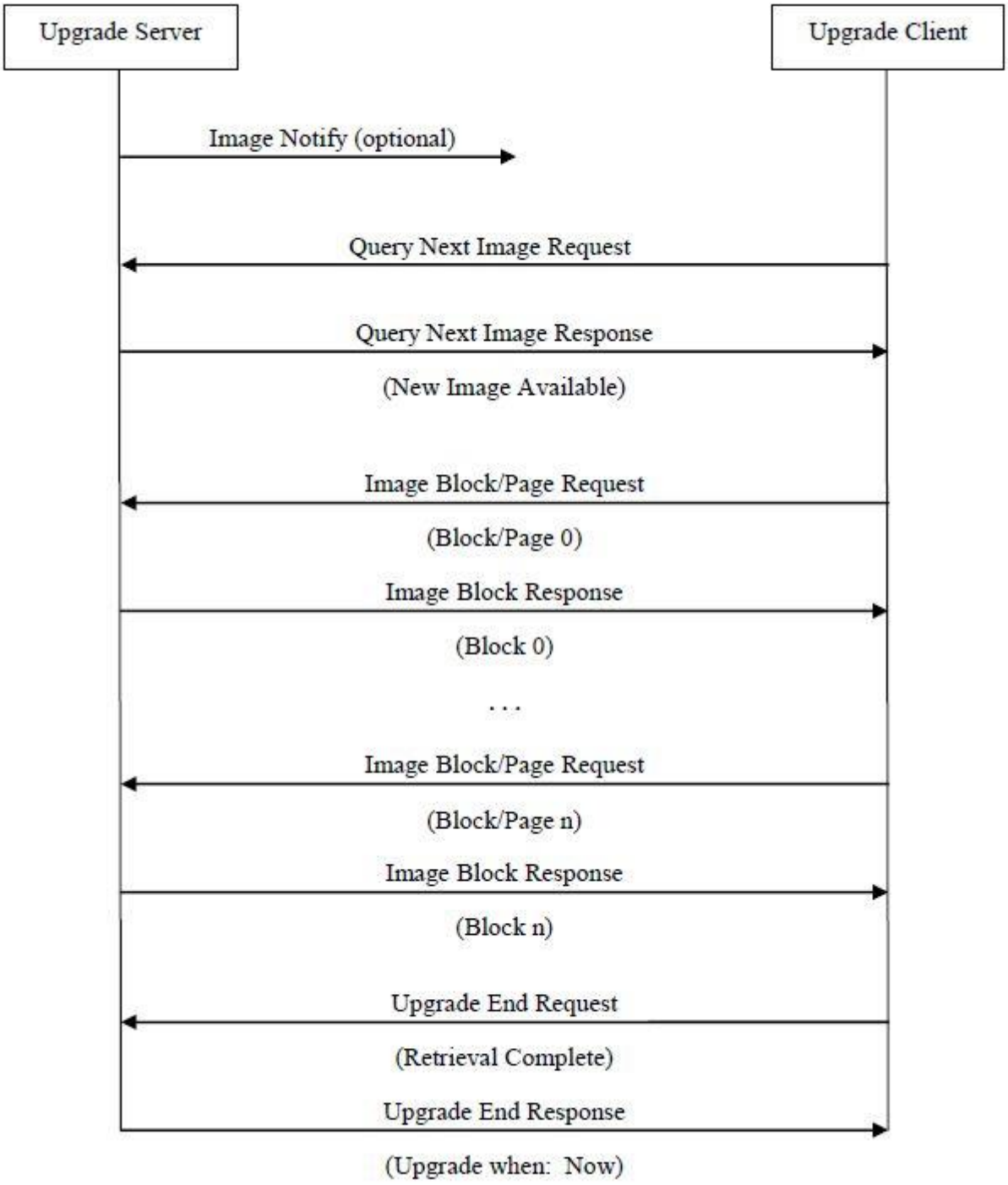
3.15.2OTA Cluster Commands

The OTA Client cluster can send the following commands

Id#	Name	Man /Opt	Relevance and ref.
0x01	Query Next Image request	M	6.10.1 OTA Cluster Command Identifiers
0x03	Image Block Request	M	6.10.1 OTA Cluster Command Identifiers
0x06	Upgrade End Request	M	6.10.1 OTA Cluster Command Identifiers

3.15.3OTA Upgrade Diagram

OTA Upgrade Message Diagram

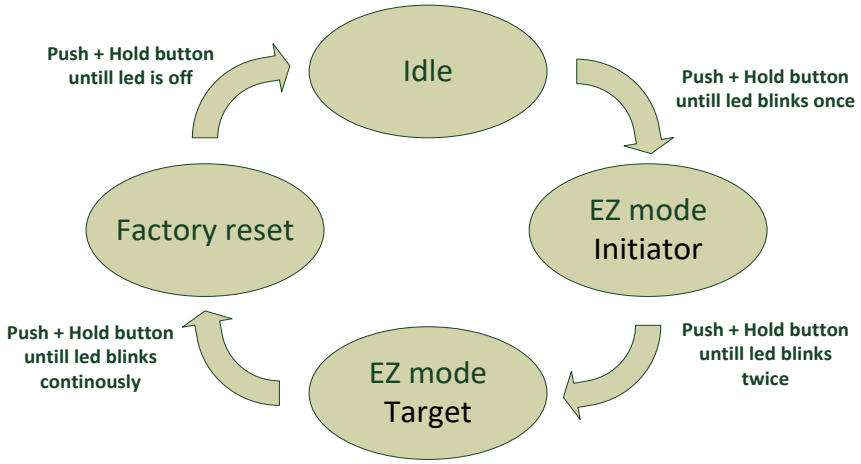


4 MMI user guide

4.1 Push button menu

Pushing the button on a device provides the user with several possibilities.

Pushing the button for longer (push, hold for a few seconds, and release) allows the user to set the device into a desired mode. A mode change happens at 5 second interval. Below, these modes are illustrated in a state chart.



When cycling through the menu modes, the state is indicated by a number of 100ms blinks on the LED. The device is supporting the ZigBee standardized EZ- mode Commissioning.

4.1.1 EZ mode – Initiator

If the devices is not on the network EZ-Mode Network Steering is invoked when the user enter this menu. The led blinks once every 1 sec until the devices has joined the network. If the device was already on the network it will broadcast the PermitJoin messages. It is the trust center policy that decides if the device is allowed to join the network.

When the device has joined the network EZ-Mode Finding and Binding is invoked and the device start to blink every 3 sec until a cluster match is found. When a match is found or the cluster examine is finished the blinking stops and the device sends a messages to the target device to stop the identify time.

The following clusters are support in EZ-mode finding and binding:

- On/Off cluster
- Metering cluster

- Electrical measurement cluster

The EZ-mode time is hard coded to 3 minutes. This is the Minimum and recommended PermitJoin time broadcast for EZ-Mode Network Steering and minimum IdentifyTime set for EZ-Mode Finding and Binding. If the user enters the menu again another 3 minutes is started.

4.1.2 EZ mode – Target

If the devices is not on the network EZ-Mode Network Steering is invoked when the user enter this menu. The led blinks twice every 1 sec until the devices has joined the network. If the device was already on the network it will broadcast the PermitJoin messages. It is the trust center policy that decides if the device is allowed to join the network.

When the device has joined the network identify mode is invoke and the device start to blink twice every 3 sec until identify mode is stopped or after the EZ-mode time has expired. If the user enters the menu again another 3 minutes is started.

4.1.3 Factory reset

To allow a device to join a network, one either has to power up a device that has not previously joined a network or push the button until the Reset To Factory default mode is indicated – and subsequently release the button. This will cause the device to reset to its factory default state and scan for a suitable coordinator.

4.2 Action on Power On

As a general rule, all end devices and routers that have not previously joined a network (or have been reset to factory default) will start up and search for a network with join permit open. In this mode, the LED will flash once every second.

Once the device has joined the network, is will start scanning for an OTA server, Time server, Poll control client, OccupancySensor client and an IAS Zone client.

If a device has joined a network and is powered down, it will attempt to rejoin this network upon power up. For the first 30 seconds hereafter, the device will be available for communication. This time can be expanded using the poll control cluster functionality.

5 General network behavior

5.1 Installation

When the device is virgin and powered for the first time it will start looking for a ZigBee PAN Coordinator or router to join. The device continually scans each ZigBee channel starting from 11 to 24. The LED will flash once every second until it joins a device.
In section 5 “MMI” it is explained how to put the device into a join or leave network mode.
Network settings are stored in NV-memory are after a power cycle the device re-join the same network.
If the device has to join a new PAN coordinator the MMI menu supports a “Join / Leave” mode.

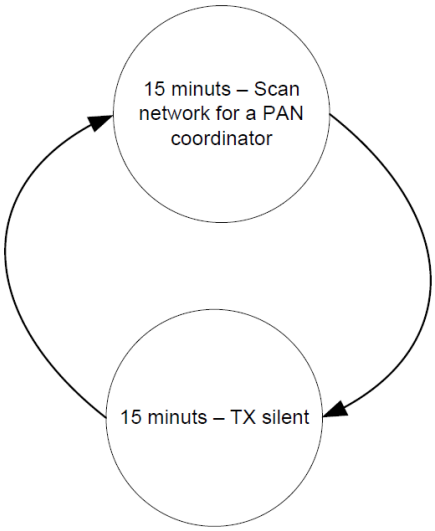
5.2 Normal – Keep alive

The device is sending a “keep alive” message to the PAN coordinator every 15 minutes to verify that the device is still connected to the network.

5.2.1 Network lost

If no “keep alive” responses are received 5 times in a row (1 hour and 15 minutes), the devices will start scanning every ZigBee channel for the PAN coordinator and try to re-join it. The LED will flash once every second until it re-joins the network.

According to the ZigBee specification TX is NOT allowed to be enabled all the time and a TX silent period has to be defined.



6 Specifications

6.1 General

Dimensions	Ø 41 x 45 mm
Colour	White
Power consumption,	0.4W
Max. switch voltage	250VAC
Max. switch current	16A
Max. switch power	~3500VA
IP-class	40
Storage temperature	-20°C to +80°C
Operation temperature	0 to +50°C
Humidity	Relative humidity 5% - 85%, non condensing
Supply voltage	207 to 253 VAC
Sensitivity	-101 dBm @ 1% PER
Output power	+10 dBm
Frequency band	47 to 53 Hz

6.2. Power Meter functionality in relays

Voltage range	207 to 253VAC
Accuracy	Accuracy: TYP ±1% Max ± 2%
Current range	16A

7 Contact Information

Technical support: Please contact Onics for support.
products@onics.com

Sales: Please contact Onics for information on prices, availability, and lead time.
info@onics.com