Appendix B UPDATE
PG&E - ZSE Clusters and Commands Supported

Requirements subject to future updates. All updates to selection criteria will be documented and communicated through Power Advocate
(www.poweradvocate.com)

Cluster / Library	Attribute Set / Command Type	Attribute / Command	Notes
ZCL	General Command Frames	Read Attributes Command	The device must be able to send the read attributes command, according to the section 2.4.1 Read Attributes Command of the ZigBee document 5123 r03 and r04.
	General Command Frames	Read Attributes Response Command	The device must be able to accept and process the read attributes respond command, according to the section 2.4.2 Read Attributes Response Command of the ZigBee document 5123 r03 and r04.
	General Command Frames	Discover Attributes Command	The device must be able to send the discovery attributes command, according to the section 2.4.13 Discover Attributes Command of the ZigBee document 5123 r03 and r04.
	General Command Frames	Discover Attributes Response Command	The device must be able to accept and process the discover attributes response command, according to the section 2.4.14 Discover Attributes Response Command of the ZigBee document 5123 r03 and r04.

Comments

The ZCL section of this table highlights the most important commands of the ZigBee cluster library, devices must be compliant with all ZCL mandatory requirements described in the section 2.4 General Command Frames of the ZigBee document 5123 r03 or r04.

Cluster / Library	Attribute Set / Command Type	Attribute / Command	Notes
Basic (0x0000)	Basic Device Information	HW Version (0x0003)	The device must support this attribute as described in the ZigBee Document 5123 r03 or r04, Table 3.8 Attributes of the Basic Device Information Attribute Set.
	Basic Device Information	StackVersion (0x0002)	The device must support this attribute as described in the ZigBee Document 5123 r03 or r04, Table 3.8 Attributes of the Basic Device Information Attribute Set.
	Basic Device Information	ApplicationVersion (0x0001)	The device must support this attribute as described in the ZigBee Document 5123 r03 or r04, Table 3.8 Attributes of the Basic Device Information Attribute Set.

Comments

The device must include ALL the mandatory Attributes from the Basic Device Information set as described in ZigBee Document 5123 r03 or r04, Table 3.8 Attributes of the Basic Device Information Attribute Set.

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Cluster / Library	Attribute Set / Command Type	Attribute / Command	Notes
Time (0x000A)	Attribute	Time	The device must be able to support this attribute as described in the ZigBee Document 5123 r03 or r04.
	Attribute	TimeStatus	The device must be able to support this attribute as described in the ZigBee Document 5123 r03 or r04.
	Attribute	TimeZone	The device must be able to support this attribute as described in the ZigBee Document 5123 r03 or r04.
	Attribute	DstStart	The device must be able to support this attribute as described in the ZigBee Document 5123 r03 or r04.
	Attribute	DstEnd	The device must be able to support this attribute as described in the ZigBee Document 5123 r03 or r04.
	Attribute	DstShift	The device must be able to support this attribute as described in the ZigBee Document 5123 r03 or r04.
	Attribute	LocalTime	The device must be able to support this attribute as described in the ZigBee Document 5123 r03 or r04.

Comments
For the scope of this project the time server will be the electric Meter, it is expected that all HAN devices get in sync with the electric meter.

Cluster / Library	Attribute Set / Command Type	Attribute / Command	Notes
OPTIONAL Price (0x0700)	Client Command	Get Current Price	Client devices must support sending this command to the Server device (Meter). As described in the ZigBee document 5356 r17.
	Server Command	Publish Price	Client devices must support the reception and processing of the this command as described in the ZigBee Document 5356 r17.
	Client Command	Price Acknowledgement	Client devices must support sending this command to the Server device (Meter) in respond time no longer to 7 seconds. As described in the ZigBee document 5356 r17.
	Block Threshold Attribute Set	Block1Threshold	Client devices must support discover, read and process at least 5 of the Block Threshold attributes, as described in the subclause D.4.2.2.2 table D.44 Block Threshold Attribute Set of the ZigBee Document 5356 r17.
		Block2Threshold	
		Block3Threshold	
		Block4Threshold	
		Block5Threshold	
	Block Period Attribute Set	StartofBlockPeriod	Client devices must support discover, read and process this 4 attributes as described in subclause D.4.2.2.3 table D.45 Block Period Attribute Set of the ZigBee Document 5356 r17.
		BlockPeriodDuration (minutes)	
		ThresholdMultiplier	
		ThresholdDivisor	
	Commodity Attribute Set	CommodityType	Client devices must support the discovery, read and process of this two attributes as described in the subclause D.4.2.2.4 table D.46 Commodity Attribute Set of the ZigBee Document 5356 r17.
		Standing Charge	

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	Block Price Information Attribute Set	NoTierBlock1Price	Client devices must support the discovery, read and processing the at least 5 Number of Tier Blocks from the server devices, as defined in the subclause D.4.2.2.5, table D.48 Block Price Information Attribute Set of the ZigBee Document 5356 r17.
		NoTierBlock2Price	
		NoTierBlock3Price	
		NoTierBlock4Price	
		NoTierBlock5Price	
	Reading Information Attribute Set	CurrentBlockPeriodConsumptionDelivered	Client devices must support the discovery, read and processing of this optional attribute as described in the subclause D.3.2.2.1, table D.11 Reading Information Attribute Set of the ZigBee Document 5356 r17.
	Comments In addition to requirements for this project devices must support all mandatory commands and attributes for the Price cluster described in the ZigBee document 5356 r17.		

Cluster / Library	Attribute Set / Command Type	Attribute / Command	Notes
	Reading Information Set	CurrentSummationDelivered	Devices must be able to discover and read this attribute from the server device. See ZigBee document 5356 r17, Table D.11 Reading Information Attribute Set.
	Reading Information Set	CurrentSummationReceived	Devices must be able to discover and read this attribute from the server device. See ZigBee document 5356 r17, Table D.11 Reading Information Attribute Set.
	Reading Information Set	DefaultUpdatePeriod	Default period value must be set to 15 seconds. NOTE: devices in fast poll mode shall be limited to rate of no more than once every 3 seconds. See ZigBee document 5356 r17, Table D.11 Reading Information Attribute Set.
	Reading Information Set	FastPollUpdatePeriod	Client devices must support the reading and processing of this attribute. Clients devices shall not request data for periods longer than 15 minutes. See ZigBee document 5356 r17, Table D.11 Reading Information Attribute Set.
	Formatting Set	UnitofMeasure	Client devices must support the reading and processing of this attribute. See ZigBee document 5356 r17, Table D.21 Formatting Attribute Set.
	Formatting Set	Multiplier	Client devices must support the reading and processing of this attribute. See ZigBee document 5356 r17, Table D.21 Formatting Attribute Set.
	Formatting Set	Divisor	Client devices must support the reading and processing of this attribute. See ZigBee document 5356 r17, Table D.21 Formatting Attribute Set.

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Metering (0x0702)	Formatting Set	SummationFormating	Client devices must support the reading and processing of this attribute. See ZigBee document 5356 r17, Table D.21 Formatting Attribute Set.
	Formatting Set	DemandFormatting	Client devices must support the reading and processing of this attribute. See ZigBee document 5356 r17, Table D.21 Formatting Attribute Set.
	Formatting Set	HistoricalConsumptionFormatting	Client devices must support the reading and processing of this attribute. See ZigBee document 5356 r17, Table D.21 Formatting Attribute Set.
	Formatting Set	MeteringDeviceType	Client devices must support the reading and processing of this attribute. See ZigBee document 5356 r17, Table D.21 Formatting Attribute Set.
	Historical Attribute Set	InstantaneousDemand	Client devices must support the reading and processing of this attribute. See ZigBee document 5356 r17, Table D.21 Formatting Attribute Set.
	Load Profile Configuration Attribute Set	MaxNumberOfPeriodsDelivered	Client devices must support the reading and processing of this attribute. See ZigBee document 5356 r17, Table D.21 Formatting Attribute Set.
	Client Command	Get Profile	Client devices must support sending this command to the server as specified in the ZigBee Document 5356 r17, Subclause D.3.2.4.1.1
	Server Command	Get Profile Response	Client devices must support the reception and processing of this command as specified in the ZigBee Document 5356 r17, Subclause D.3.2.3.1.1
	Client Command	Request Fast Poll Mode	Client devices must support the reception and processing of this command as specified in the ZigBee Document 5356 r17, Subclause D.3.2.4.1.4
	Server Command	Request Fast Poll Mode Response	Client devices must support the reception and processing of this command as specified in the ZigBee Document 5356 r17, Subclause D.3.2.3.1.4
Comments			
For the scope of this project any HAN device is considered to be a client for the Metering cluster and the Electric Meter device is to be considered the server. For any other attribute or command not described in this documents, the devices should refer to the requirements established by the ZigBee alliance and be compliant to all mandatory attributes and commands described in the profile specification.			

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Cluster / Library	Attribute Set / Command Type	Attribute / Command	Notes
Messaging (0x0703)	Server Command	Display Message Command	The client device must support the reception and processing of this command according to the ZigBee Document 5356 r17 subclause D.5.2.3.1
	Server Command	Cancel Message Command	The client device must support the reception and processing of this command according to the ZigBee Document 5356 r17 subclause D.5.2.3.2
	Client Command	Get Last Message	The client device must support sending this command to the server, although, currently the use case for this command is outside of the scope of this project. See ZigBee Document 5356 subclause D.5.3.3.1
	Client Command	Message Confirmation	The client must support sending this command to the server as specified in the ZigBee Document 5356 r17 subclause D.5.3.3.2

Comments

All the attributes for this cluster must be compliant with the ZigBee Document 5356r17 and unless specified all mandatory attributes should be included.

Notes and Guidelines

This document highlights some of the clusters, commands and attributes more relevant for the scope of the project, also, indicates the optional attributes, commands or features to be included in the HAN device.

All HAN devices must be ZigBee Certified and be listed in the ZigBee website or provide prove certification with the ZigBee certificate, therefore, ALL HAN devices must be compliant with the ZigBee Smart Energy Profile Specification and all Mandatory clusters, attributes, command and features must be included regardless if those clusters, command, attributes or features are listed in this document or not.
All the clusters, commands, attributes or features included in the HAN device are expected to perform and behave as indicated in the ZigBee Smart Energy Profile Specification document (5356 r17) unless otherwise is explicitly mentioned otherwise.