Danalock Product manual

The Danalock is a secure electronic door lock that supports the Z-Wave Plus standard, which is compatible with earlier versions of Z-Wave. The Danalock is battery supplied and therefore it is a FLIRS Frequently Listening Routing Slave. The Danalock uses the Secure Command Class to secure the communication and therefore requires a controller, which support Secure Command Class.

Z-Wave interoperability
The Danalock can be included and operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers and/or other applications. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

Z-Wave add/inclusion and remove/exclusion

- To add or include the Danalock into a Z-Wave network
  1. Set the controller in inclusion mode
  2. Touch the User Button until you hear two beeps.
- To remove or exclude the Danalock into a Z-Wave network
  1. Set the controller in exclusion mode
  2. Touch the User Button until you hear two beeps.

Factory Reset
The Danalock can be set to factory settings by holding the User Button for ten beeps.
Please use this procedure only when the primary controller is missing or otherwise inoperable.

Batteries
The Danalock uses 4 CR123A batteries. Only use four new batteries from the same manufacturer. Do not mix new and old batteries.

The Package contains

- Danalock
- Batteries
- Mounting manual
- Adapters (may vary from country to country)
- Umbraco tool

Supported Command Classes

Application Status Command Class V1 (unsecure)

The Danalock can send an application rejection if an error occurs.

Association CC V2 (secure)

The Danalock supports:

- 1 Grouping identifier
- 1 Device in each grouping

Group 1 is Lifeline. All unsolicited reports are sent to the node in Lifeline. The Danalock can send the following commands through Lifeline:

- Battery alarm
- Device Reset Locally report
- Notification report, Door lock operation report or no response to a door operation.

Association Group Information CC V1 (secure)

Configuration byte #12	Group#	Profiles 2 bytes	Command Class & Command (list) N bytes	Group Name(UTF-8)
0	1	General:Lifeline	Association Group Command List Report, Battery report, Device Reset Locally notification, Door lock operation report	Lifeline
1	1	General:Lifeline	Association Group Command List Report, Battery report, Device Reset Locally notification, Notification report	Lifeline
2	1	General:Lifeline	Association Group Command List Report, Battery report, Device Reset Locally notification	Lifeline

Configuration byte #12 is default 0. If Notification CC is enabled by the controller Configuration byte #12 is automatically changed to 1.

Battery CC V1 (secure & unsecure)

The Battery Get request can be used to get the status of the battery. If configuration byte 7 Battery Type is set to mains power the battery reports always 100%. When a low battery level is detected a low battery warning will be sent through Lifeline.

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Configuration CC V1 (secure)

Z-Wave parameter no.	Parameter Name	Parameter Size	Default value	Values	Description
1	Direction	1 Byte	0	0-1	0 = The motor goes clockwise when latched 1 = The motor goes counterclockwise when latched
2	Speed (Torque)	1 Byte	3	1-5	1 = Slowest 2 = Slow 3 = Normal 4 = Fast 5 = Fastest
3	Mode	1 Byte	1	0-2	DEPRECATED. 0 = Stepper motor mode wave drive(power saving) 1 = Stepper motor mode full drive(Normal) 2 = Relay mode
4	Turn degrees	1 Byte	9	1-100	DEPRECATED. Factor 10 turn degrees (1 = 10 degrees, 9 = 90 degrees etc.)
5	Auto Latch time	1 Byte	0	0-60	How many seconds from the lock has been unlatched to it automatically should close again. If 0 then it is disabled.
6	Sound	1 Byte	1	0-1	Disable or enable the beep sound from latch or unlatch operations(0 = Disable, 1 = Enable.)
7	Battery Type	1 Byte	0=3.6 V, 1=3.0 V, 2=Bat	0-1	Set the type of battery that powers the device. This affects the returned battery state. 0 = 3.6 Volt battery, 1 = 3.0 Volt battery. 2 = Mains power, changing from and to mains power requires the Danalock to be excluded and included.
8	Battery alarm value	1 Byte	50	0-100	When the battery level is below this value, the device will notify user with a beep sound after latch or unlatch.
9	Turn&Go	1 Byte	0	0-1	0 = Turn&Go off, 1 = Turn&Go on. Used if the lock is using a optional rotation sensor. Latch&Go on will turn automatically when manual turn is detected.
10	Brake&GoBack	1 Byte	0	0-15	0 = Disabled. 1-15 Seconds to brake. When used the lock will brake for x amount of seconds and then turn 75 degrees back. Made for special doors without door lever.(Only when unlatching).
11	Async	1 Byte	0	0-1	0 = Async off, 1 = Async on. Used if the lock is using an optional rotation sensor. When async is enabled the lock will auto calibrate if already unlatched and asked to Unlatch again (used for special door locks where the key turn is asynced from the inside nob.)
12	Door lock operation report type	1 Byte	0	0-2	0 = Simple supported by all controllers that support door locks. 1 = Advanced, more specific reports through notification Command Class. 2 = No Door lock operation reports are sent unsolicited. Should not be used. Use Notification CC enable instead.

Device Reset Locally CC V1 (unsecure)

When the Z-wave module is reset it sends a report to tell the controller it has been reset. The lock is reset by holding the user button for 10 beeps. Please use this procedure only when the primary controller is missing or otherwise inoperable

Door Lock CC V2 (secure)

Door Lock Operation is used to lock and unlock the Danalock. See table to see how the Door Lock Mode paramater affects the lock.

Door Lock Operation Paramater

	Secured	Unsecured
Door Lock Mode	0xFF	0x00-0xEF

In a Door Lock Operation Report the Danalock will report:

Door Lock Operation Report

	Unlocked	locked
Door Lock Mode	0x00	0xFF
Handles	0x11	0x11
Door Condition	0x02	0x05
Lock Timeout Minutes	0xFE	0xFE
Lock Timeout Seconds	0xFE	0xFE

The Danalock does not use the Door Lock Configuration to adjust settings, the configuration bytes are used instead. The Danalock ignores Door Lock Configuration Set frames and response a Door Lock Configuration Get with:

Door Lock Configuration Report

Parameter	Value
Operation Type	Constant operation(0x01)
Handles	Handle 1 enabled (0x11)
Lock Timeout Minutes	Timeout not supported(0xFE)
Lock Timeout Seconds	Timeout not supported(0xFE)

Firmware Update Meta Data CC V2 (secure)

The Danalock supports firmware update of the Z-Wave module over the air.

Manufacture Specific CC V2 (secure & unsecure)

Manufacturer ID

Poly-control	0x010E	Assign by Sigma

Product Type ID

8	Danalock

Product ID

2	Danalock Circle

Device specific report command supports serial number in binary format. The serial number is the mac address of the Bluetooth Smart module.

Notification CC V3 (secure)

The Notification CC is implemented as a push only, which means only pushes notification to the controller. Sequence number is not supported. If Notification for Access Control (0x06) is activated Notification CC is sent instead of Door Lock Operation Report.

Supported notifications		
Notification Type	Event	Comments
Access Control (0x06)	Manual Lock Operation (0x01)	User Touch button used to lock the door.
	Manual Unlock Operation (0x02)	User Touch button used to unlock the door.
	RF Lock Operation (0x03)	Ekey system or keypad lock without PIN code
	RF Unlock Operation (0x04)	Ekey system
	Keypad Lock Operation(0x05)	Locked by keypad with a PIN code. PIN number is sent as Event parameter.
	Keypad Unlock Operation(0x06)	Unlocked by keypad with a PIN code. PIN number is sent as Event parameter.
	Auto Lock Locked Operation(0x09)	The Auto Latch time has locked the door.
	Lock Jammed (0x0B)	The lock/unlock operation could not be completed.
	Keypad Temporary Disabled (0x10)	The lock is in timeout mode.
	Unlock by RF with invalid user code (0x14)	Invalid user code has been used on the keypad.

Power Level CC V1 (secure & unsecure)

Can be used under inclusion to test signal strength from the controller and to the device.

Schedule CC V1 (secure)

The Danalock supports schedule of user codes. This is used to time limit user codes, so the Danalock automatically activates and deactivates the user code independent of the controller.

The Danalock supports 20 schedules. It supports only User Code set. It does not support "Support Enable/Disable", "Fallback support" or "Override Support" as they make no sense for a lock.

When a scheduling ends the corresponding user code gets deactivated. A User Code can only be in one schedule at the time.

The Danalock supports all types of start time support.

- Start now
- Start Hour and Minute
- Calendar time
- Weekdays

A schedule Set will override if the User Code is already set. A User Code Set will override if a schedule uses the slot.

Schedule Entry Lock CC V1 (secure)

This command class is deprecated by Sigma and is only available as legacy support of older controller which does not support the newer recommended Schedule CC which is the successor for the Schedule Entry Lock CC.

The Schedule Entry Lock CC makes it possible to time restrict the User Codes. With week day restriction it is possible to make a code active in a period for example from 10 to 14 every Wednesday. The start and end time of day and the weekday can be chosen. The year day restriction makes the User Code active after a start time and inactive after an end time.

Each of the 20 User PINs has:

- One weekday slot
- One year day slot

Only one type of slot can be used per User Code.

If a schedule lock is deleted, then the corresponding user code will be active. The Schedule Entry Lock uses local time which must be set otherwise an Application rejection is sent. The correspondent User Code has to be set before Schedule Entry Lock otherwise an Application rejection is sent.

In order for the Danalock to support both the Schedule CC and the Schedule Entry Lock CC some restrictions apply to the Entry Schedule Lock CC. When setting date time spans bigger than 65535 minutes (~45 Days) the start minute and end minute MUST be 0. When setting date time spans bigger than 65535 hours(~7,5Years) the start and end hour and minute MUST be 0. If these constrictions are not meet an Application Rejection is sent.

Security CC V1 (secure & unsecure)

See Z-Wave documentation.

Time CC V2 (secure)

Local time is used to when validating the time fenced User Codes. In order to use Time Offset Set and Get the UTC, time must be set by using the Time Parameters Set command. If the UTC time is not set, an application rejection is sent. It is recommended that the controller sends a Time Parameter Set and a Time Offset Set to the Danalock to set the time in the Danalock.

Time parameters CC V1 (secure)

The Time Parameters CC is used to set the UTC time in lock. It is recommended that the controller sends a Time Parameter Set and a Time Offset Set to the Danalock to set the time in the Danalock.

User Code CC V1 (secure)

The Danalock supports 20 usercode with 4-10 digits.

A schedule Set will override if the User Code is already set. A User Code Set will override if a schedule uses the slot.

Version CC V2 (secure)

This Commmand Class is used to get information about which version of the different command classes the Danalock supports and the software version of the Danalock.

Version Report

Z-wave Library Type	ZW_LIB_SLAVE_ENHANCED(0x03) ZW050x Enhanced 232 slave library
Z-Wave Protocol Version	3
Z-Wave Protocol Sub Version	99
Developer's Kit Version	6.51.03

Firmware 0 version

Version of the firmware on the Z-Wave module

Version	Subversion	Comments
1	1	First release
1	2	Minor improvements

Firmware 1 version

Version of the firmware on the MCU.

Version	Subversion	Comments
1	6	First release
1	8	Minor improvements

Hardware version

0x88	Danalock

Z-Wave Plus Info CC V2 (secure & unsecure)

Z-Wave Plus Info

roleType	LSS = ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_SLEEPING_LISTENING or AOS = ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_ALWAYS_ON
nodeType	ZWAVEPLUS_INFO_REPORT_NODE_TYPE_ZWAVEPLUS_NODE
installerIconType	ICON_TYPE_GENERIC_DOOR_LOCK_KEYPAD
userIconType1	ICON_TYPE_GENERIC_DOOR_LOCK_KEYPAD
nodeType->generic	GENERIC_TYPE_ENTRY_CONTROL
nodeType->specific	SPECIFIC_TYPE_SECURE_KEYPAD_DOOR_LOCK
Device Type	Secure Keypad Door Lock

Controller Integration

When the Danalock has been included into the network, the controller should:

* Set the Lifeline. Association group 1

* Activate notification for Access control

* Set time parameters in the Danalock

* Set time offset in the Danalock