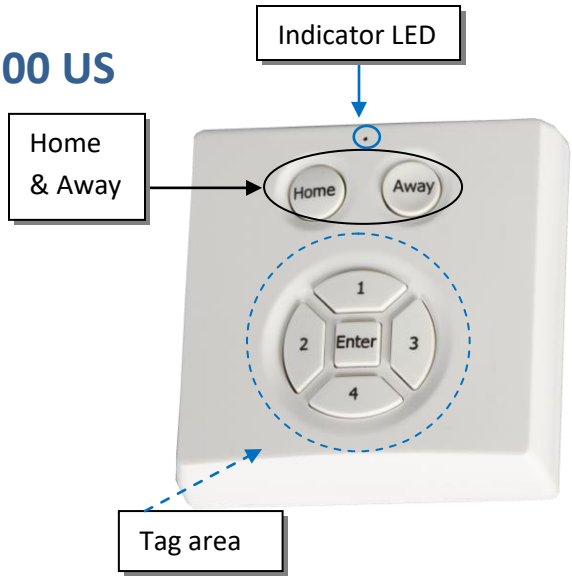
Quick start: **Tag Reader 500 US**



Technical specifications

Normal operating voltage	2x AA 1,5V batteries
Frequency range	908.42 MHz
Wireless range	Up to 150 meters in a mesh network
Protocols supported	ISO15693, ISO18000-3, Tag-it™, RFID
Buzzer-sound	Approx. 60dBa at 10 cm distance
Z-Wave frames encapsulated	Security layer

Basic operations

- The Tag Reader 500 is a security enabled Z-Wave Plus product.
- The *Tag Reader 500* can arm/disarm a security system.
- The *Tag Reader 500* can read RFID-tags.
- The *Tag Reader 500* has the possibility for the user to manually insert codes.
- The *Tag Reader 500's* indicator light will react differently on each action.
- The *Tag Reader 500* has a buzzer, which can be used as walk-in/walk-out notification (alarm is being disabled/activated).

How it operates

When the *Tag Reader 500* is successful added to a Z-Wave network. It can be mounted on the wall.
When pressing the Home or Away button, you can present an RFID TAG or use the manual code buttons to issue an event to a controller.

With a controller you can request the battery level.

Add or Remove into/from Z-Wave network [1]

1. Press and hold the enter button for two seconds (indication LED blinks shortly) and release to start the add/remove routine.
    a. The indication LED will start blinking twice when the Tag Reader 500 starts the add routine.
    b. The indication LED will blink 3 times when the Tag Reader 500 starts the remove routine.
2. When classic inclusion failed, the product will start Network Wide Inclusion automatically.

[1] Make sure your Z-Wave controller is in the correct operation mode (add or remove).

Technical Manual: **Tag Reader 500 US**

Caution:

- **This device is using a radio signal that passes through walls, windows and doors. The range is strongly influenced by local conditions such as large metal objects, house wiring, concrete, furniture, refrigerators, microwaves and similar items. On average, the indoor range is approximately 30 meters.**
- **Do not expose this product to excessive heat or moisture.**
- **Prevent long term exposure to direct sunlight.**
- **Do not attempt to repair this product. If the product is damaged or if you are in doubt about the proper operation, take the product back to the place of purchase.**
- **Do not clean the product with any liquid.**
- **Indoor use only.**

Normal operating voltage	2x AA 1.5V batteries From 2.3Vdc to 4.0Vdc Do not use rechargeable batteries
Frequency range	908.42 MHz
Wireless range	Approximately 100 meters in line of sight Min. 150 meters with good mesh network (max 4 hops)
Battery lifetime	Normal usage will give approximately 5 years lifetime Notice: long and big networks will increase the battery lifetime
Protocols supported	ISO15693, ISO18000-3, Tag-it™, RFID
Tag read distance	Approximately one centimeter in front of the enter button
Buzzer-sound	Approximately 60dB at 10 centimeter distance
Storage temperature	-5°C to +65°C
Storage humidity	10% to 70%
Operating temperature	10°C to 40°C
Operating humidity	30% to 80%
Security Z-Wave layer	Yes

Technical details

Product dimensions (length x width x height)

Tag Reader 500 = 62 x 62 x 20 mm

Indicators

The indicator light gives various statuses of the device as follow:

Fixed indicators

1. Ready for learn mode: red indicator light blinks every second
2. Learn in progress (add): red indicator light 2 times every second
3. Learn in progress (remove): red indicator light 3 times every 1.5 second
4. Learn mode success: red indicator light is on for one second
5. Manual wake up successful red indicator light is on for 1 second

Variable indicators (using the indicator command class)

1. System walkin/out (armed) red blink 2x every second (indicator: ARMED)
2. RF message send failed red blink 8x (indicator: FAULT)
3. Ready for arm/disarm (enter rfid/pin) red on for 5 seconds (indicator: ENTER_ID)
4. Valid rfid/pin received green on for 1 second (indicator: READY)

Note: above values are default values

Operating modes

The Tag Reader 500 has 2 modes in which it can operate: gateway mode or local mode.

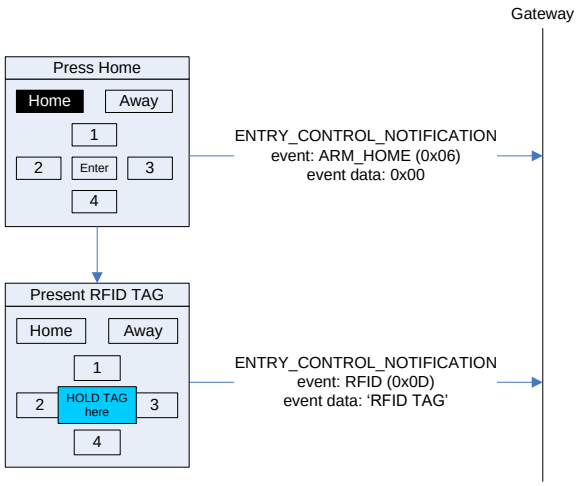
You can switch between modes using a *configuration set, parameter 7.* (see § CONFIGURATION)
For safety reasons and expanded capabilities we recommend using the gateway mode, if your Z-Wave controller doesn't support the COMMAND_CLASS_ENTRY_CONTROL you can use local mode to still make use of the functionalities of the Tag Reader 500.

Gateway mode

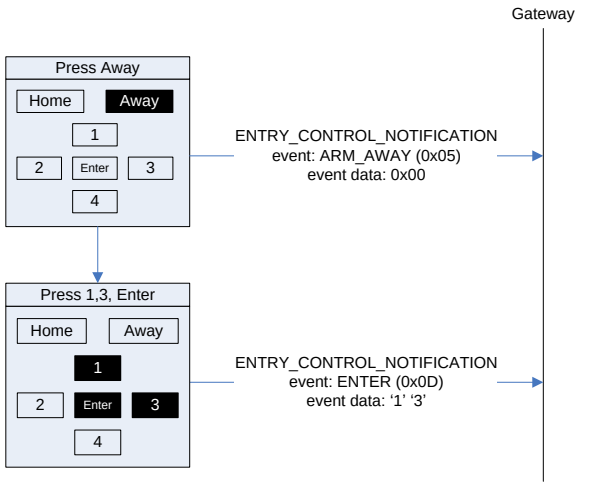
In this mode a gateway (Z-Wave controller) will process the command instructed by the user on the Tag Reader 500. The COMMAND_CLASS_ENTRY_CONTROL is used to notify the user event to the gateway. A gateway which has support for this can take any preferred action based on the given (entry control) event.

There are 3 types of user actions in this mode.

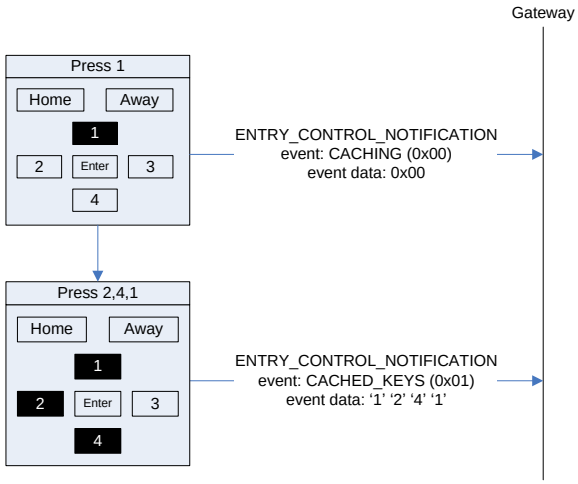
1. Arm HOME (or AWAY) using the RFID tag



2. Arm (HOME or) AWAY using the enter button



3. Activate a scene with the numeric pad.

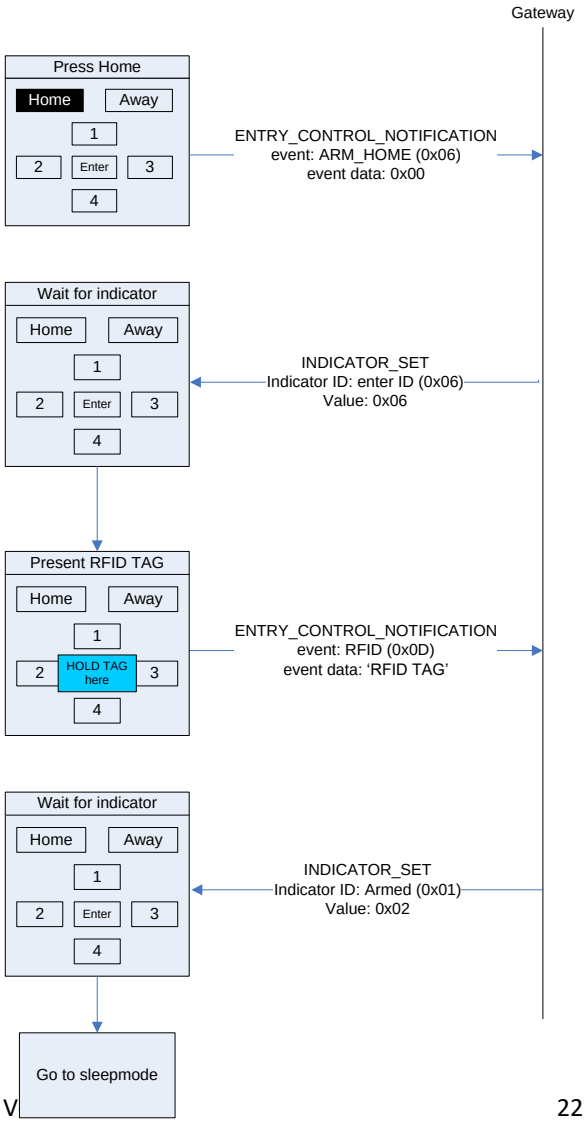


Gateway confirmation

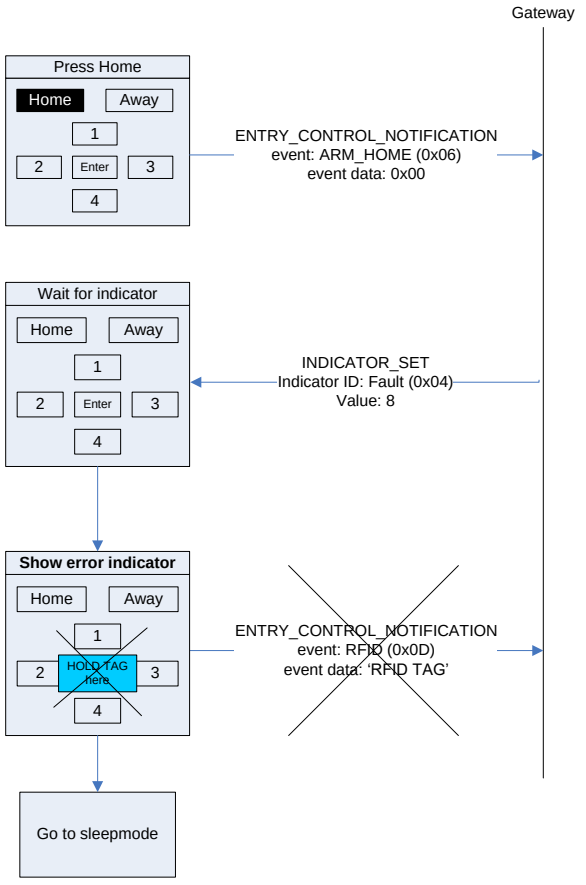
In gateway mode it is also possible to let the gateway confirm that the system can be armed to home or away. You can enable this feature using a *configuration set, parameter 8.* (see § CONFIGURATION)

In that case the following applies.

1. Gateway approves that system can be armed



2. Gateway disapproves that system can be armed



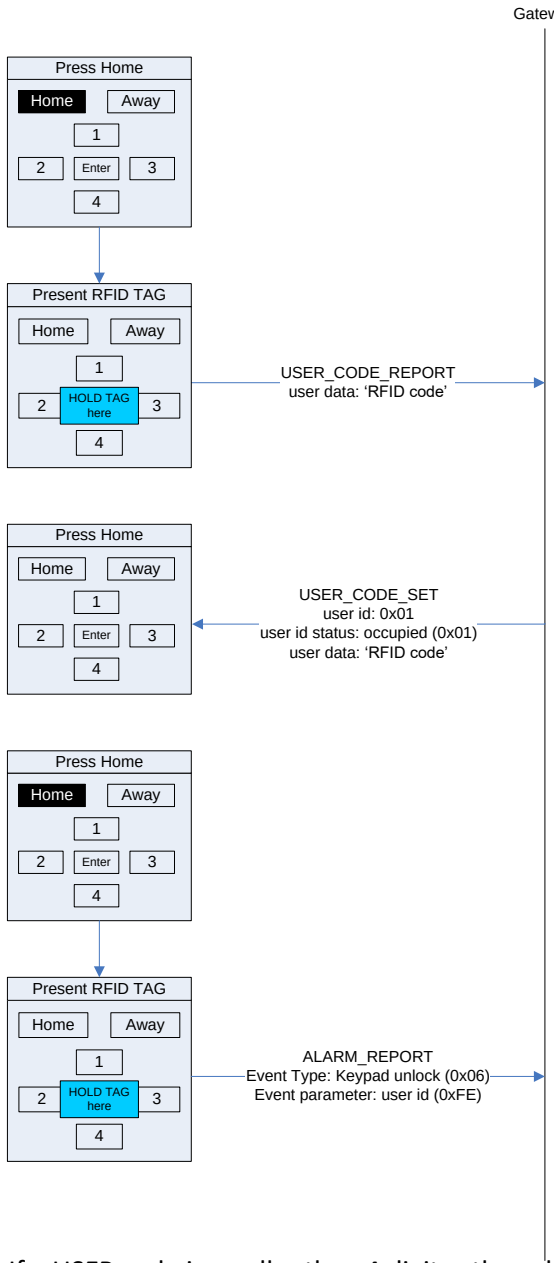
In above example 2, the Tag can't be presented anymore to the Tag Reader 500.
Note: Only use this mode when your gateway has support for the indicator command version 2. Else the arm to home or away functionalities of the Tag Reader 500 can't be used.

Local mode

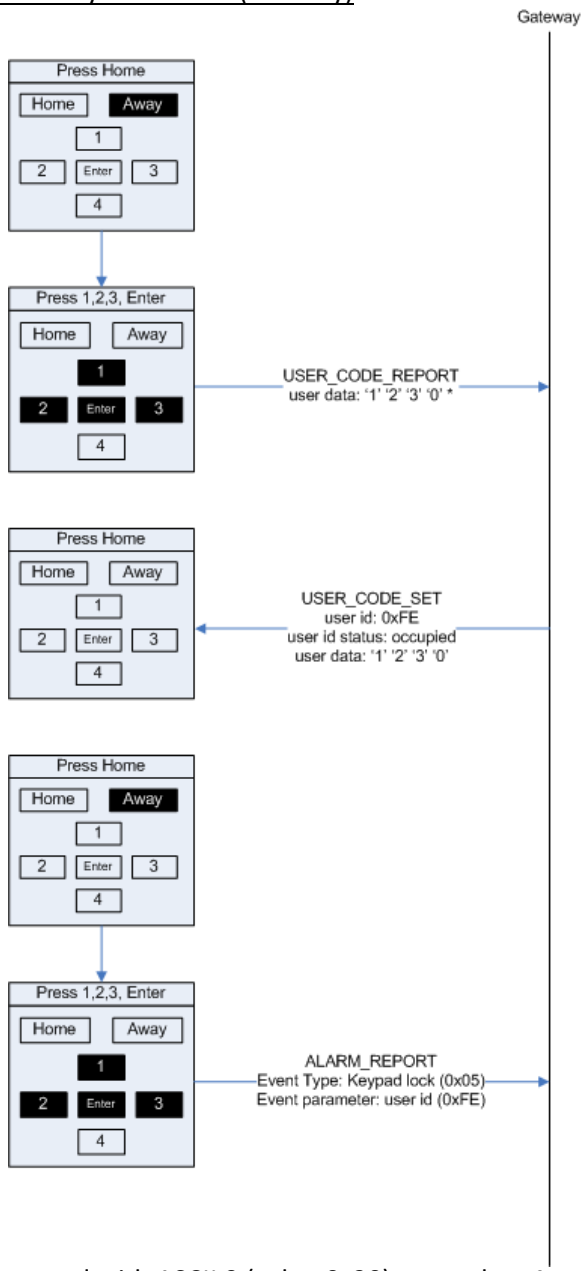
In this mode the *Tag Reader 500* operates as an access control device, using the combination of the USER_CODE command class and the ALARM_V2 command class.
User codes are to be stored in the *Tag Reader 500*, using the USER_CODE_SET command.
When the user codes are stored in the *Tag Reader 500*, the ALARM_REPORT_V2 will have the corresponding USER_ID with the used USER_CODE.

There are 2 types of user actions in this mode.
NOTE: in this mode it is not possible to activate scenes, only arm the home or away event.
There are two types of access control with user codes:

1. Using the RFID reader to arm (Home or) Away



2. Manually arm Home (or Away)



* If a USER code is smaller than 4 digits , the value is supplemented with ASCII 0 (value 0x30) to reach a 4 digits code. Any USER code with size 4 or more will be reported with the length of the USER_CODE.

You can find a more detailed description and examples of this mode in the § typical operations. This chapter also describes how you can use the SWITCH_BINARY command class to activate the ARM indicator event.

Z-Wave Plus

Z+ Device type: Entry Control Keypad
Z+ Role type: ROLE_TYPE_SLAVE_SLEEPING_REPORTING

Basic type: BASIC_TYPE_ROUTING_SLAVE
Generic type: GENERIC_TYPE_ENTRY_CONTROL
Specific type: SPECIFIC_TYPE_SECURE_KEYPAD
Listening: FALSE, Z-Wave Lib: 6.61.00
Z-Wave Security Layer: Yes

Supporting command classes

Class: 0x5E COMMAND_CLASS_ZWAVEPLUS_INFO_V2 **(NS)**
Class: 0x72 COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2 **(S)**
Class: 0x86 COMMAND_CLASS_VERSION_V2 **(S)**
Class: 0x5A COMMAND_CLASS_DEVICE_RESET_LOCALLY **(S)**
Class: 0x85 COMMAND_CLASS_ASSOCIATION_V2 **(S)**
Class: 0x59 COMMAND_CLASS_ASSOCIATION_GRP_INFO **(S)**
Class: 0x84 COMMAND_CLASS_WAKE_UP **(S)**
class: 0x70 COMMAND_CLASS_CONFIGURATION **(S)**
class: 0x71 COMMAND_CLASS_ALARM_V2 **(S only)**
class: 0x25 COMMAND_CLASS_SWITCH_BINARY **(S)**
class: 0x63 COMMAND_CLASS_USER_CODE **(S only)**
class: 0x6F COMMAND_CLASS_ENTRY_CONTROL **(S only)**
class: 0x6F COMMAND_CLASS_INDICATOR_V2 **(S only)**
Class: 0x80 COMMAND_CLASS_BATTERY **(S)**
class: 0x63 COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2 **(NS)**
class: 0x63 COMMAND_CLASS_SECURITY **(NS)**

Security

The Tag Reader 500 is a Security Enabled Z-Wave Plus Product. It is recommended to use a Z-Wave controller that has security support in order to fully utilize the product. The marking applies on above command class list:
(NS): Z-Wave frames are encapsulated WITHOUT the security layer when added to both secure and non-secure Z-Wave controllers.
(S): Z-Wave frames are encapsulated WITH the security layer when added to a secure Z-Wave controller and WITHOUT the security layer when added to a non-secure Z-Wave controller.
(S only): Z-Wave frames are always encapsulated WITH the security layer and therefore can't be used when added to a non-secure Z-Wave controller.

NOTE: when the Tag Reader 500 is included into a non-secure Z-Wave controller the product can't be used for entry control purposes neither will the keypad or RFID reader work. If the product doesn't work as expected please check if your controller has support for Z-Wave security layer.

Routing slave
This Z-Wave product will be used as slave. Slave nodes are nodes in a Z-Wave network that receive commands and perform actions based on the command. A routing slave can route Z-Wave messages to other nodes in the network.
Reporting Sleeping Slave
The Z-Wave plus role type of this routing slave product is 'REPORTING SLEEPING SLAVE'.
That means that this device is not always reachable for the controller. In sleep mode the device is not active listening, the device will wake up according to the wakeup command class. Once the device sends a wake up notification it can communicate with a Z-Wave controller.
Add initiator
The add initiator is used when Primary and add Controllers add nodes into the network. When both the add initiator have been activated simultaneously the new node will be added to the network (if the node was not added previously)
Remove initiator
The remove initiator is used by Primary Controllers to remove nodes from the network. When the remove initiator and a slave initiator are activated simultaneously, it will result in the slave being removed from the network (and reset to NodeID zero). Even if the slave was not part of the network it will still be reset by this action.
Z-Wave compatibility
Because this is a Z-Wave device, it means it can co-operate with other Z-Wave devices of other manufacturers. It can co-exist in a Z-Wave network existing with product from other manufacturers.
Hops & retries
The Z-Wave range has a range of up to 40 meters in line of sight. This signal is not limited to the 40 meter range due to routing the Z-Wave message to other nodes in the network. This way the range of the Z-Wave network can be expanded to 160 meters indoors (limit of 4 hops).
Note: Routing can be done by non-battery powered Z-Wave products regardless of the manufacturer.

COMMAND_CLASS_ZWAVEPLUS_INFO_V2

With the Z-Wave plus info get command you can request the Z-Wave plus information of the *Tag Reader 500.* The information contains

- Role Type: Reporting Sleeping Slave
- Node Type: Zwave Plus Node
- Installer Icon: Entry Control Keypad
- User Icon: Entry Control Keypad

class: 0x63 COMMAND_CLASS_USER_CODE
Note: The User Code command class is only used in local mode.
The purpose of the User Code command class is to configure the *Tag Reader 500* to accept certain RFID Tags or codes. This is typically done by some kind of static controller or Gateway (for instance the Internet Gateway from BeNext).
After sending a User Code Set, including a unique User Identifier (UID), the in-use state (0x01) and the Tag code or keypad sequence using ASCII codes, the *Tag Reader 500* will accept the codes and notify any other device using the Alarm command class.
This other device can be configured using the Association command class and is typically the same controller or Gateway.
When a tag or code is not known to the *Tag Reader 500*, it will send an unsolicited report to the devices in its association group with the UID 0x00. The value in this message can be used to configure new tags.
Note2: Code length must be 4 to 10 ASCII digits.

COMMAND_CLASS_ENTRY_CONTROL

Note: The Entry Control code command class is only used in gateway mode.
This command class can be used to notify a gateway of an entry event.
The supported events are:

- Caching
- Cached Keys
- Enter
- Arm Home
- Arm Away
- RFID

The Entry ENTRY_CONTROL_CONFIGURATION_SET command can be used to configure the values when using the Caching and Cached Keys event.
Key Cache Size: The number of keys that is pressed after the Cached Keys event is sent
Key Cache Timeout: The timeout after the Cached Keys event is sent

§ Control describes some examples of how the Entry Control command can be used.

COMMAND_CLASS_INDICATOR_V2

The indicator command class can be used to manipulate several indicators.
The Tag Reader 500 supports the following indicators:

Indicator: ARMED (red LED)
Description: the number of times the armed routine is executed.
Supported properties: On_Off_Cycles
Supported values: 0x00 – 0xFF (0- 255 times)
Note: an armed on-off cycle can be configured with configuration parameter 4

Indicator: FAULT (red LED)
Description: the number of times the fault indicator is shown.
Supported properties: On_Off_Cycles
Supported values: 0x00 – 0xFF (0- 255 times)

Indicator: READY (green LED)
Description: the time the ready indicator is shown.
Supported properties: On_Off_Period
Supported values: 0x00 – 0xFF (0 -25.5 seconds)

Indicator: ENTER_ID (red LED)
Description: the time the enter id indicator is shown.
Supported properties: On_Off_Cycles
Supported values: 0x00 – 0xFF (0 -25.5 seconds)
Note: the enter id indicator can only be used in gateway mode and when gateway confirmation is enabled which can be configured with configuration parameters 7 and 8.

Example 1: To set the ARMED routine for 5 times send the following Z-Wave frame to the Tag Reader 500
COMMAND_CLASS_INDICATOR
INDICATOR _SET
Indicator 0 value: *0x00**
Indicator Object Count: *0x01*
Indicator ID 1: *0x01 (ARMED)*
Property ID 1: *0x04 (ON_OFF_CYCLES)*
Value 1: *0x05 (times)*

Example 2: To set the READY indicator on for 2 seconds send the following Z-Wave frame to the Tag Reader 500
COMMAND_CLASS_INDICATOR
INDICATOR _SET
Indicator 0 value: *0x00**
Indicator Object Count: *0x01*
Indicator ID 1: *0x03 (READY)*
Property ID 1: *0x03 (ON_OFF_PERIOD)*
Value 1: *0x14 (2.0 seconds)*

* Note that indicator is 0 is always ignored by the device.

class: 0x86 COMMAND_CLASS_VERSION_V2

This Command Class is used to obtain information about the *Tag Reader 500*. The Z-Wave library type, the Z-Wave protocol version and the application version will be reported.

class: 0x72 COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2
This will report information about the manufacturer. This product will contain the manufacturer ID of *BeNext*. Manufacturer ID of *BeNext* is 138, the ID of this product is 7.

Because the version 2 is supported this command class can also be used to request the serial number of the device with the DEVICE_SPECIFIC_GET command.

class 0x20 COMMAND_CLASS_BASIC
The Basic command class only has a supporting role and is mapped to the Switch Binary command class.

class 0x25 COMMAND_CLASS_SWITCH_BINARY
The Switch Binary command class is used to enable or disable the notification sound. This sound is typically used to notify a user when the alarm system is being activated. See also the 'Sound Notification' section.

class: 0x80 COMMAND_CLASS_BATTERY
This class is used to request and report battery levels for a given device.
When battery level is lower then 20% the Tag Reader 500 will send a battery warning (value 255) after every wake up notification. A battery get will report the actual value even if below 20 %.

An unsolicited (without receiving a BATTERY_GET) BATTERY_REPORT is sent when the Tag Reader 500 has measured that the battery level has dropped.

Note that the following points apply for the unsolicited BATTERY_REPORT:

- When new batteries applied a report is sent with the current value
- The report will always be lower then the previous sent value
- The battery level in the report is maximum 2% lower then the previous sent value

class: 0x85 COMMAND_CLASS_ASSOCIATION_V2

The Association command class is used to associate the *Tag Reader 500* to other devices. When a tag or code is read, the *Tag Reader 500* will send a notification to the Z-Wave devices in its association group.
Number of groupings: 1

Association Group 1
Maximum supported nodes per group: 1
Used for: reporting all messages to the lifeline group (See the association group information for reported command classes)

COMMAND_CLASS_ASSOCIATION_GRP_INFO

The *Tag Reader 500* supports only 1 association group.

Group 1 Name:

- Size: 8
- Name: 'Lifeline'

Group 1 Info

- Mode: 0
- Profile: 0x0001
  - Main profile : General (0x00)
  - Sub profile : Lifeline (0x01)
- Event Code: 0
-

Group 1 command list

- List length: 10
- COMMAND_CLASS_ENTRY_CONTROL
- ENTRY_CONTROL_NOTIFICATION
- COMMAND_CLASS_USER_CODE
- USER_CODE_REPORT
- COMMAND_CLASS_ALARM
- ALARM_REPORT
- COMMAND_CLASS_SWITCH_BINARY
- SWITCH_BINARY_REPORT
- COMMAND_CLASS_DEVICE_RESET_LOCALLY
- DEVICE_RESET_LOCALLY_NOTIFICATION

NOTE: All other groups report list length 0.

class: 0x84 COMMAND_CLASS_WAKE_UP_V2

The Wake Up command class is used at battery-operated devices. This class allows the *Tag Reader 500* to wake up occasionally to notify others devices, that the *Tag Reader 500* is ready to receive commands. After receiving the commands the *Tag Reader 500* will go into sleep mode again. The wake up interval can be set using the WAKE_UP_INTERVAL_SET command.

It is possible to send a **wake up notification** on user interaction. Besides sending a Wake Up Notification automatically every two hours (or any other time that is configured using the Wake Up Interval Set command), the *Tag Reader 500* also sends a Wake Up Notification when:

- The enter button is pressed for 4 seconds. (led will go on for 1 second to confirm).
- A tag read
- A code is entered using the keypad

When the wake up time is set to 0 a **wake up notification** is never send periodically, only on user interaction.

The Tag Reader 500 has the following wake up capabilities:

- Minimum wake up interval: 3 seconds
- Maximum wake up interval: 30 days
- Default wake up interval: 2 hours
- Interval step: 1 second

class: 0x70 COMMAND_CLASS_CONFIGURATION_V1

Configure parameters:

1. **Set to default**

Description:	Set all configuration values to default values (factory settings). Read more in chapter Configuration Reset.
Default:	0xAA
Size:	1 byte*
Param1:	if 0xFF (any value other than 0x55, 0xAA) set all parameters to default.
Param2,3,4:	Not used

2. **Feedback time**

Description:	To configure the time the beep is automatically turned off in seconds.
Default:	0x0F
Param1:	0x00: Disable 0x01 – 0xFE: Value in seconds 0xFF: Endless
Param2, 3, 4:	Not used
Size:	1 byte*

3. **Feedback timeout**

Description:	To configure the timeout to wait for a WAKEUP_NO_MORE_INFORMATION before the error beep is automatically sound. The error beeps are fixed 8 beeps shortly after each other.
Default:	0x00
Param1:	0x00: Disabled 0x01 – 0xFF: Value in seconds

Param2,3,4:	Not used
Size:	1 byte*

4. **Feedback beeps per second**

Description:	To configure the number of beeps per second. Every beep is fixed about 10ms.
Default:	0x02
Param1:	0x00 – 0xFF: Number of beeps per second
Param2,3,4:	Not used
Size:	1 byte*

5. **Always awake mode**

Description:	To configure the always awake mode.
Default:	0x01
Size:	1 byte*
Param1:	0x01: Mode 1, normal operating mode. 0x03: Always awake mode, Z-Wave chip is always on to request e.g. version or manufacturer id. 0x00, 0x02, 0x04-0xFF: Mode 1, normal operating mode
Param2, 3, 4:	Not used

6. **Not used**
7. **Operation mode**

Description:	The mode that the Tag Reader 500 communicates with the associated gateway.
Default:	0x00 (command class entry control)
Size:	1 byte*
Param1:	0x00: the RFID and Numeric codes are reported in gateway mode 0x01 – 0xFF: the RFID and Numeric codes are reported in local mode
Param2, 3, 4:	Not used

8. **Gateway confirmation**

Description:	In gateway mode it is possible to let the gateway decide if the Tag Reader 500 can arm to home or away. If gateway indication is disabled the Tag Reader 500 automatically assumes that it can arm and will wait for a user input of RFID TAG or numeric code.
Default:	0x00 (disabled)
Size:	1 byte*
Param1:	0x00: gateway confirmation disabled 0x01-0xFF: gateway confirmation enabled
Param2, 3, 4:	Not used

* If a size is other then given size the frame is ignored totally so configuration values are **not** changed.

class: 0x71 COMMAND_CLASS_ALARM_V2
In the *Tag Reader 500*, this command class is used to confirm a known tag in local mode:

1. Report tags or codes that are entered. The *Tag Reader 500* will send an unsolicited report to the devices in its lifeline group with the UID that belongs to the code or tag and whether the alarm system should be armed (Away or Home).

    a. Alarm Type: Access Control Alarm (0x06)
    Alarm Event: Keypad Lock operation (0x05) & Keypad Unlock operation (0x06)
    Alarm Event parameters: User ID (related to the USER_CODE_SET)

Every other alarm type that is requested will be ignored by application.

COMMAND_CLASS_DEVICE_RESET_LOCALLY

When the product is removed manually the DEVICE_RESET_LOCALLY_NOTIFICATION command is sent to node associated in the lifeline association group.

COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2

The *Tag Reader 500500* supports OTA (Over-The-Air) update.

This means that it is possible to update your firmware using Z-Wave. To accomplish this a capable controller is needed.

COMMAND_CLASS_SECURITY
For safety reasons the *Tag Reader 500* can encapsulate his Z-Wave messages with a security encryption. Therefore it is not possible to read in and outgoing Z-Wave data with a RF monitoring tool.

If the messages are requested without the security encryption they are also reported without it the encryption. Therefore this product can still be used with a non-security Z-Wave controller.

Configuration reset

The Tag Reader 500 supports a configuration reset function. Configuration reset means:

- All configuration values are defaulted
- Wake up interval is defaulted
- Entry Control configuration are defaulted
- Indicators values are defaulted

This function can be activated by sending a configuration set frame:

CONFIGURATION_SET
Parameter: 0x01
Size: 0x01 (can't be different from 1)
Value: 0xFF (can be any value except for 0x55 or 0xAA)

When the value of configuration value is requested 2 possible values can be returned.

CONFIGURATION_REPORT
Parameter: 0x01
Value 0x55: Configuration settings of the device are altered.

The device will report this even if the configuration parameters are changed back to the default value.

Value 0xAA: Configuration of the device is untouched.
Note that this value will not change to 0x55 upon modifying the wake up interval and that re-setting the value to 0xAA will always reset the wake up interval.

Always awake mode

The always awake mode is used to request different values from the device e.g. version and manufacturer specific.
Note: in always awake mode the batteries will be drain very fast, we do not recommend to use this mode for a longer period. Always awake mode should only be used in order to configure the device.
Note: The always awake mode is strictly used to obtain information from the Tag Reader 500 using Z-Wave commands, the normal operations will not be fully functional.

The always awake mode can be activated by:

CONFIGURATION_SET	
Parameter:	0x05
Size:	0x01 (can't be different from 1)
Value:	0x03 (mode 3)

The LED of the device will toggle on and off every second to notify you that it is functioning in always awake mode.

The always awake mode can be deactivated by:

CONFIGURATION_SET	
Parameter:	0x05
Size:	0x01 (can't be different from 1)
Value:	Any value except 3

A second option to deactivate mode 3 is:

1. Remove batteries
2. Wait ca 10 seconds
3. Replace batteries

The always awake mode is automatically de-activated after 4 minutes.

Back to factory settings

This product has an option to reset its factory settings. This can be done manually without the need of a Z-Wave controller. When the factory settings are set the following will apply:

- The product will be removed from the Z-Wave network.
- All associations will be cleared.
- All user codes will be cleared.
- All configurations will be restored to default.

To reset to factory settings please follow these steps"

1. Press the enter button for 2 seconds, release the enter button to start the remove routine (indication LED will blink 3 times every second).
2. During the remove routine press enter button 4 times within 1,5 seconds to reset the product.
3. If 'back to factory settings' was successful the indication LED will go in for 1 full second on the end of the remove routine.
4. A DEVICE_RESET_LOCALLY_NOTIFICATION is sent to the nodes associated in the lifeline group.

NOTE: Please use this procedure only when the network primary controller is missing or otherwise inoperable

Sound notification

The *Tag Reader 500* is capable of playing a notification sound. This feature is typically used to notify a user that an alarm system is being activated. Since the *Tag Reader 500* is a non-listening device, the feature can not be controlled at all times. It requires the *Tag Reader 500* to wake up and send a Wake Up Notification.

After sending a notification that a tag/code is read (either an unknown or already configured code), the *Tag Reader 500* will send a Wake Up Notification.

The notification sound can be turned on/off upon receiving any Wake Up Notification. See the section about the Wake Up Command Class for information on when a Wake Up Notification is send.

Notification sound and acknowledgement
The *Tag Reader 500* supports three types of notification sound configurations:

1. Notification sound disabled (configuration parameter 2 set to zero)
2. Notification sound enabled (*default*, configuration parameter 2 set to auto-stop time).
3. Notification sound and acknowledgement enabled (configuration parameter 3 set to acknowledgement timeout).

In the first mode, any Basic or Switch Binary commands that are received are ignored.

The second mode, the default, can be used to inform a user that the alarm system is armed or disarmed. To use this, you can send a Basic or Switch Binary set on (0xFF) after receiving an Alarm Report and the Wake Up Notification following it.

The last mode can be used in situations where, for example, users can only disarm the alarm system at certain times. In this case, the user can be notified whether or not its code or tag is accepted.
By configuring configuration parameter 3, you can set an acknowledge timeout. Whenever a Lock/Unlock Alarm Report containing an UID is send by the *Tag Reader 500*, the acknowledgement timeout timer is started.

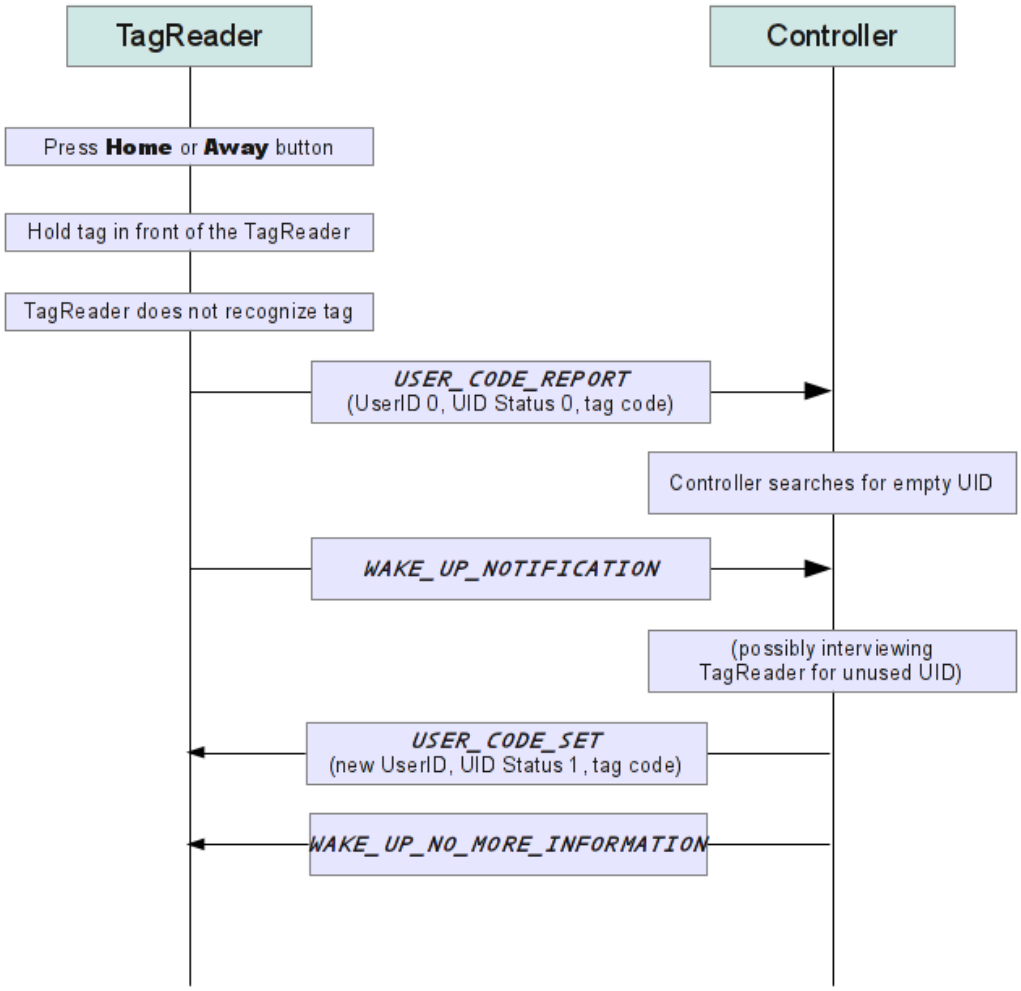
After this there are two possibilities:
1. The *Tag Reader 500* does not receive anything (or receives a Wake Up No More Information upon its Wake Up Notification). It starts the error sound to notify the user of the unaccepted code.
2. The *Tag Reader 500* receives either a Basic (or Switch Binary) on (to start the normal notification sound) or off (to silently acknowledge the code). The acknowledgement timer is stopped.

Note that it is actually possible to disable notification sound, but enable acknowledgement. In this case a silent acknowledgement can be both a Basic/Switch Binary on (0xFF) or off (0x00).

Typical operation diagrams

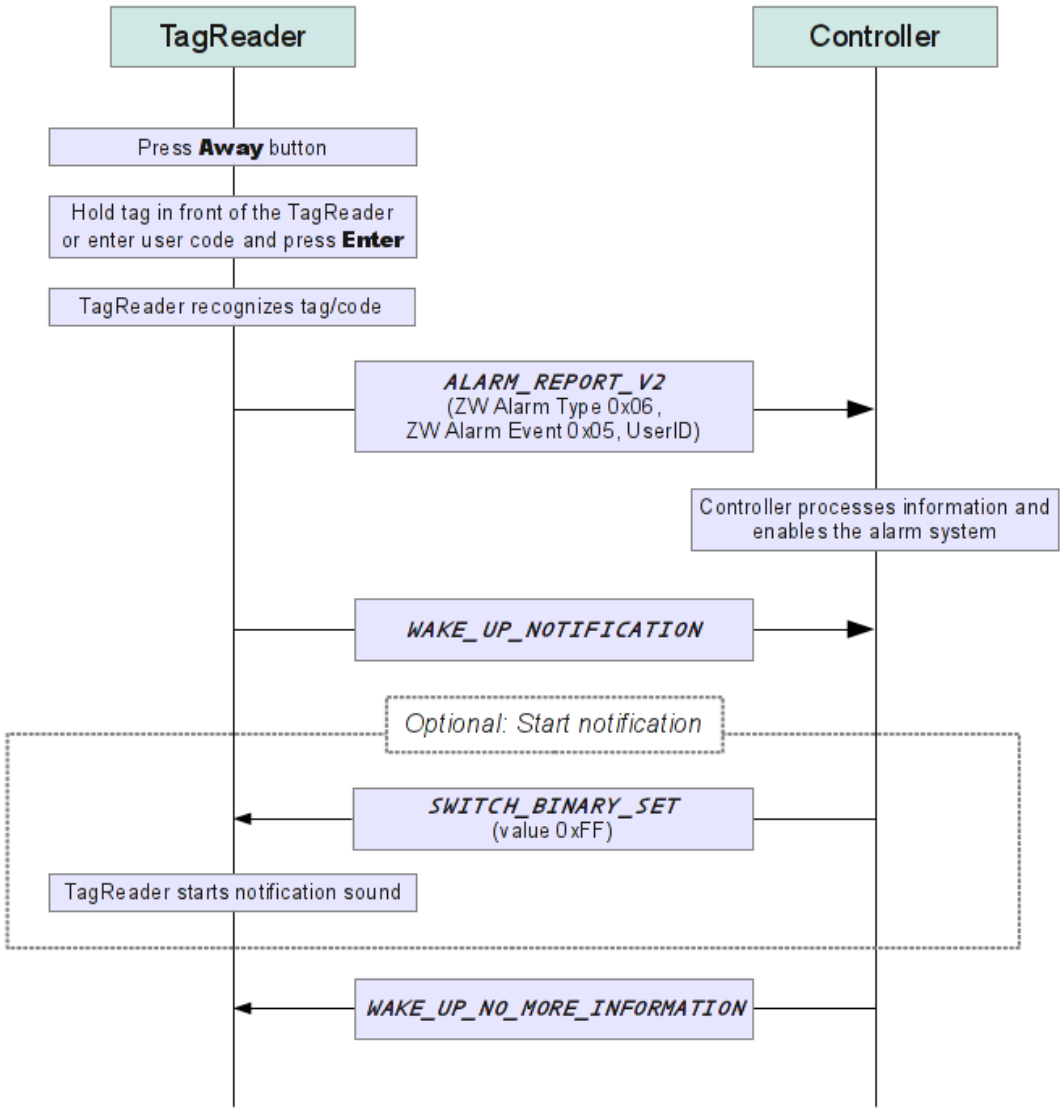
The following diagrams show the user action that is required and the messages which are being sent from/to the *Tag Reader 500* for several basic operations, including optional functionality as the sound notification and UID acknowledgement.
Note that the diagrams are assuming that the Tag Reader 500 operates in local mode

Configure a new tag
(For configuring new codes, you can skip directly to the WAKE_UP_NOTIFICATION).

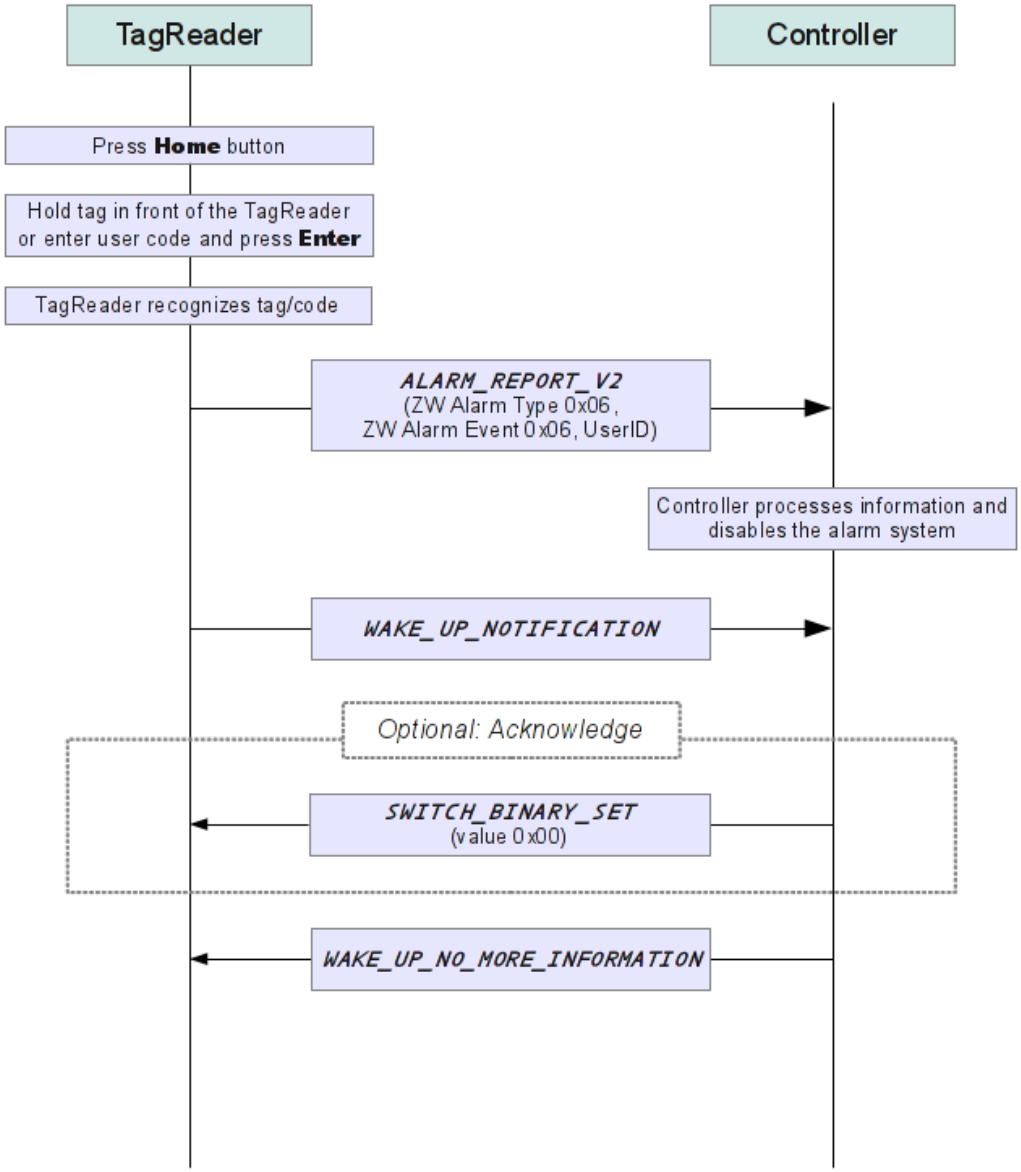


Note: the Tag code in above diagram is not the actual RFID TAG code but transformed to a ASCII binary digit code. You should use this binary code also in the USER_CODE_SET command to store it in the Tag Reader 500

Arm the alarm system



Disarm the alarm system



Example more explained

NOTE: If you readout the **Tag** for the first time you will receive a USER_CODE_REPORT

With this user code you can configure an empty User_ID inside the Tag Reader 500 with that TAG-code.
The same way you can configure a manual user code (like home + 1,2,3,4 + enter), you will send a User_Code_Set to the User_ID.

Let me make an example.
You have a TAG (= from a customer called Paul) with hex raw value 0x8F086C2C500001000000. This raw hex value will be transformed to an ASCII digit code to make it conform the USER_CODE command classes standard. The code will become (for example) 0x39313230351930303032
You will send this code back to the Tag Reader 500 that you want to make a new user with User_ID= 1.
The next time that Paul will show the tag in front of the reader it will not send this user_code_report anymore because it recognizes that this is a valid user with User_ID=1. Now the Tag Reader 500 will send an Alarm_Report_v2 with the User_ID=1 (to tell the controller that Paul entered his tag and pressed on button home (unlock) or pressed on away (lock)).
See the flowchart diagrams above.

This same trick will happen when you configure a manual user code inside the Tag Reader 500 like (1,2,3,4 + enter) for this example you have configured this usercode_set 0x31323334 (ascii value 1,2,3,4) to a new user which will be User_ID=2
The next time you will enter home + 1234+enter the Tag Reader 500 will report an AlarmReportV2 with Unlock alarm by user_id=2.
The controller will have to handle this alarm message and disable the alarm or active a special scene.

FAQ

Q: My Tag Reader 500 makes an error sound (beeping 8 times in 1 second) every time I press a button, what could be the problem?

A: This could be 1 of the following problems

- The Tag Reader 500 is not added to a Z-Wave network.
- The Tag Reader 500 is added to a non-secure Z-Wave controller, please check with the manufacturer of your Z-Wave controller if it has support for the Z-Wave security layer.
- The Tag Reader 500 doesn't have an association set up in to its lifeline association group. Please use the ASSOCIATION command class with group 1.