# RYRR50S COMMAND SET

## Instruction structure

1. The instructions use the form of HEX, and the mutual transmission format between the processor and the module is as follows.

| Length | Command | Data | Check Sum |
|---|---|---|---|

Length: The total number of Bytes after Length, including Command, Data, and Check Sum, 1 BYTE.

Command: Represents the action issued, 1 BYTE.

Data: According to each command, the data in the Command has a different number of BYTES.

Check Sum: From Length, Command, Data, each Bytes XOR operation result, 1 BYTE.

For example: The processor sends to the module is 03 01 05 07

The module response the processor is 07 01 F1 3D 56 AA B1 87

If the command is problematic, and the module will respond 03 FF FF 03

## Noun abbreviations

ATQA: Answer To Request acc. For ATQA card type code, please refer to NXP AN10833.pdf

SAK: Select Acknowledge For SAK code, please refer to NXP AN10833.pdf

UID: Unique Identifier

APP: Applicaiton

STD: Standard data file

WUPA: Wake-UP command

REQA: REQuest command

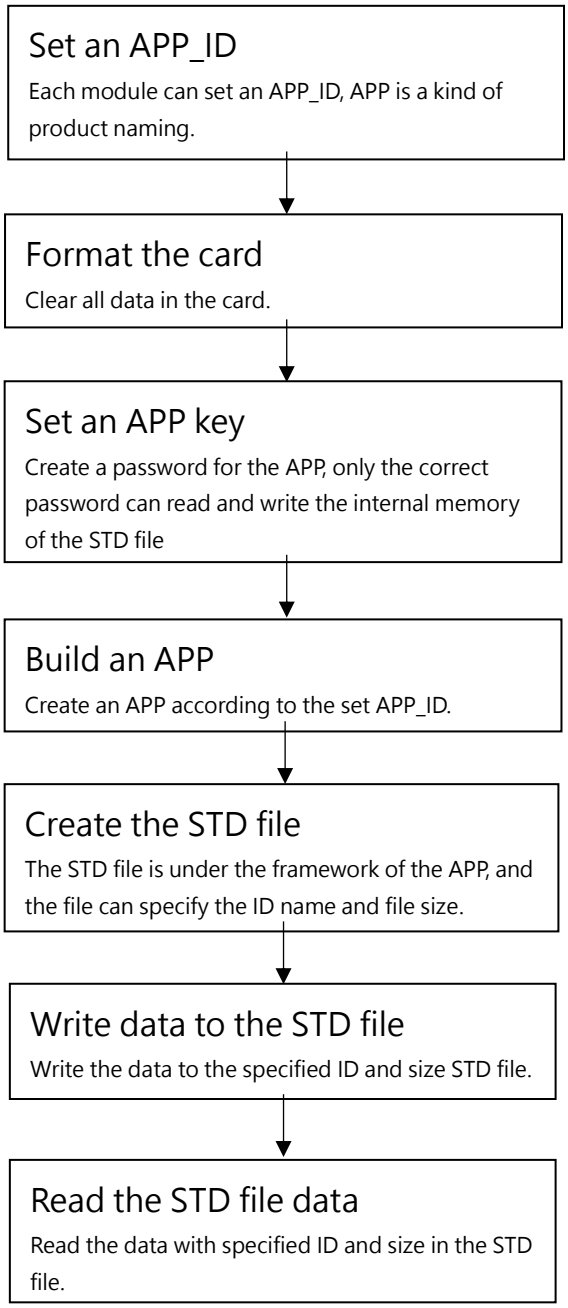
RATS: Request for Answer To Select

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# MIFARE DESFIRE INSTRUCTIONS

Display REYAX_RYRR50S ASCII string after booting 0x52 45 59 41 58 5F 52 59 52 52 35 30 53

# COMMAND FLOW CHART




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# COMMAND SET

| Function | Command | Data transfer |
|---|---|---|
| | | Data reply |
| Set a Baud rate | 0x02 | 1 Byte represents Baud rate<br>0x00 is 9600bps<br>0x01 is 19200bps (default value)<br>0x02 is 38400bps<br>0x03 ix 57600bps<br>0x04 is 115200bps<br>**After setting, it will be memorized in FLASH.*<br>**Example of setting the Baud rate to 115200bps: 0x03 02 04 05* |
| | | 1 Byte represents Baud rate<br>Example response: 0x03 02 04 05 |
| Set a RF transmit power | 0x03 | TBD |
| | | TBD |
| Query the firmware version | 0x04 | Example response: 0x02 04 06 |
| | | Vx.xx(ASCII)<br>For example: V1.00(ASCII)<br>Example response: 0x07 04 56 31 2E 30 30 4A |
| Read the card UID | 0x20 | 1 Byte<br>0x00 means to read MIFARE DESFIRE, the card will continue to be read after the instruction is completed, and will not stop until the card is read.<br>Command example: 0x03 20 00 23 |
| | | The format is in order: UID 7 BYTES, ATQA1 1 BYTE, ATQA2 1 BYTES, SAK 1 BYTES.<br>Example response of reading card successfully: 0x0C 20 04 45 6F 82 49 5C 80 44 03 20 72<br>If the card is not read, it will reply: 0x03 FF FF 03 |
| Set an APP_ID | 0x41 | APP_ID length is 3 Bytes, and up to 10 APP_IDs can be created.<br>Command example: 0x05 41 12 34 56 34 |
| | | Example response: 0x02 41 43 |
| Format the card | 0x43 | Command example: 0x02 43 41 |
| | | Example response: 0x02 43 41 |

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| | | |
|---|---|---|
| Set an APP key | 0x42 | The key is 24 bytes in total, AES128 only uses the first 16 bytes and the last 8 bytes is meaningless, and 3K3DES uses a total of 24 bytes.<br>Command example:<br>0x1A 42 22 *00 00 00 00* 00 00 00 00 *00 00 00 00* 00 00 00 00 *00 00 00 00* 00 00 00 00 7A<br>**After the setting is completed, it will be stored in FLASH, and the STD file can be directly read and written later.* |
| | | Example response: 0x02 42 40 |
| Build an APP | 0x44 | Command example: 0x02 44 46 |
| | | Example response: 0x02 44 46 |
| Build the STD file | 0x45 | STD files can be created under APP_ID, the first BYTE is the file ID, the maximum value is 0x1F. The second to 4th BYTE is the file size, and the second BYTE is the LSB.<br>An example of a command with an ID of 04 and a file size of 64 BYTES: 0x06 45 04 40 00 00 07 |
| | | Example response: 0x02 45 47 |
| Write a data to the STD file | 0x51 | The first BYTE is the file ID, the second to 4th BYTE is the file size, and the second BYTE is the LSB.<br>Then write data to STD file.<br>Command example: 0x16 51 04 10 00 00 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF 53 |
| | | Example response: 0x02 51 53 |
| Read the data of the STD file | 0x50 | The first BYTE is the file ID, the second to 4th BYTE is the file size, and the second BYTE is the LSB.<br>Command example: 0x05 50 04 10 00 00 41 |
| | | Example response: 0x12 50 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF 42 |
| Delete the STD file | 0x47 | 1 BYTES data ID.<br>Command example: 0x03 47 04 40 |
| | | Example response: 0x02 47 45 |
| Delete the APP | 0x46 | APP_ID length is 3 Bytes.<br>Command example: 0x05 46 12 34 56 33 |
| | | Example response: 0x 02 46 44 |
| Enter the sleep mode | 0xFE | Command example: 0x02 FE FC |
| | | Example response: 0x02 FE FC |
| Wake up the module | 0xFD | Command example: 0x02 FD FF |
| | | Example response: Same as the boot display REYAX_RYRR50S ASCII string 0x52 45 59 41 58 5F 52 59 52 52 35 30 53 |
| Reset the | 0xFF | Command example: 0x02 FF FD |

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| | | |
|---|---|---|
| module | | Example response: 0x02 FF FD |

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