



OEM-DES Devices
13.56 MHz HF RFID Module
Communication Protocol, Add-On IO Control

Contents

1	IO Control	3
1.1	Overview: What Commands Control Which IO	3
1.2	Commands for IO Control.....	3
1.2.1	SET_BUZZER(0x02)	3
1.2.2	SET_LED(0x03) Standard Version	3
1.2.3	SET_LED(0x03) Extended Version	3
2	Measurements with the M900 Core Module.....	4
2.1	IOs with Standard Firmware (GD32F350)	4
2.1.1	Test with IO5	5
2.2	IOs with Standard Firmware (STM32F103)	5
2.2.1	Test with IO5	5
2.3	IOs with PC/SC	6

iDTRONIC GmbH
Ludwig-Reichling-Straße 4
67059 Ludwigshafen
Germany/Deutschland

Issue 1.4
– 14. April 2025 –

Phone: +49 621 6690094-0
Fax: +49 621 6690094-9
E-Mail: info@idtronic.de
Web: idtronic.de

Subject to alteration without prior notice.
© Copyright iDTRONIC GmbH 2025
Printed in Germany

1 IO Control

1.1 Overview: What Commands Control Which IO

IO1	=>	controlled with command "SET_BUZZER(0x02)"
IO2	=>	controlled with "SET_LED(0x03)", Extended Command
IO3	=>	controlled with "SET_LED(0x03)", Extended Command
IO4	=>	controlled with "SET_LED(0x03)", Standard Command
IO5	=>	not accessible via user command
IO6	=>	not accessible via user command

Command examples for LED IOs

50 00 02 03 03 04 56 (Standard Command Example)

50 00 03 03 FF 03 03 AF (Extended Command Example)

1.2 Commands for IO Control

1.2.1 SET_BUZZER(0x02)

```
int SetBuzzer(unsigned char ucRates, unsigned char ucTimes);
```

-----DLL Explanation-----

Input parameters:

ucRates: beep keeping times will be $ucRates * 50$ ms and silence $(500 - ucRates * 50)$ ms
ucTimes: beep ucTimes times.

Return: 0 (OK) or Error Code

-----Protocol Example-----

Send: >> 50 00 02 02 03 04 57 (beep 4 times, every beep keeps sound 150ms and silence 350ms)

Return: << 50 00 00 02 52

1.2.2 SET_LED(0x03) Standard Version

```
int SetLed(unsigned char ucRates, unsigned char ucTimes);
```

-----DLL Explanation-----

Input parameters:

ucRates: Shine keeping times will be $ucRates * 50$ ms and go out $(500 - ucRates * 50)$ ms
ucTimes: Flicker ucTimes times.

Return: 0 (OK) or Error Code

-----Protocol Example-----

Send: >> 50 00 02 03 03 04 56 (flicker 4 times, every time shine 150ms and go out 350ms)

Return: << 50 00 00 03 53

1.2.3 SET_LED(0x03) Extended Version

This is not supported in the API so far.

Command from PC/PLC to RFID

Example telegram: 50 00 03 03 FF 03 03 AF

The Bytes in detail:

50	= Start of Telegram
00 03	= 3 Byte payload between command code and checksum
03	= Command code
FF	= Extended version
03	= Bitmask enable IO control, 0x07 enables IO2...IO4 to be controlled with this command
03	= Bitmask set IO ON/OFF, 0x07 switches IO2...IO4 ON
xx	= Checksum

Bitmask Enable IO Control by Command

Bit 7	Bit6	Bit 5	Bit 4	Bit 3	Bit2	Bit 1	Bit 0
RFU	RFU	RFU	RFU	RFU	IO4	IO3	IO2

Bitmask Set IO ON/OFF

Bit 7	Bit6	Bit 5	Bit 4	Bit 3	Bit2	Bit 1	Bit 0
RFU	RFU	RFU	RFU	RFU	IO4	IO3	IO2

Examples

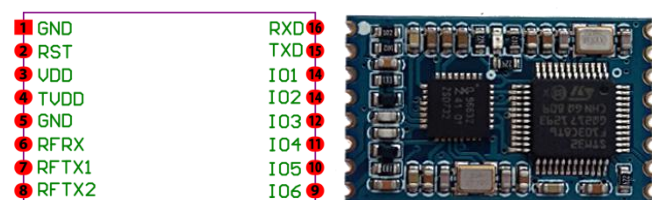
50 00 03 03 FF 07 01 A9	= IO2 ON	blue
50 00 03 03 FF 07 02 AA	= IO3 ON	red
50 00 03 03 FF 07 03 AB	= IO3 + IO2 ON	violet
50 00 03 03 FF 07 04 AC	= IO4 ON	green
50 00 03 03 FF 07 05 AD	= IO4 + IO2 ON	turquoise
50 00 03 03 FF 07 06 AE	= IO4 + IO3 ON	yellow
50 00 03 03 FF 07 07 AF	= IO4 + IO3 +IO2 ON	white
50 00 03 03 FF 07 00 A8	= All OFF	OFF

Colour names taken from OEM-DES-R840-USB

RFU = Reserved for Future Use

2 Measurements with the M900 Core Module

2.1 IOs with Standard Firmware (GD32F350)



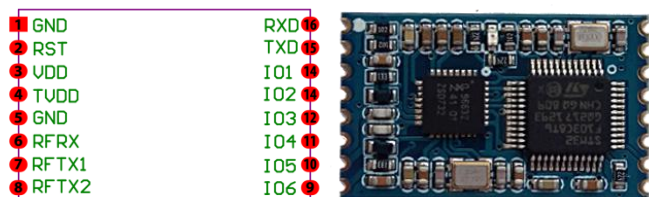
Pin	Signal	IO Type	50 00 03 03 FF 07 00 A8 = All Off	50 00 03 03 FF 07 07 AF = IO4 + IO3 +IO2 ON
14	IO1		0	0
13	IO2		1	0
12	IO3		1	0
11	IO4		1	0
10	IO5		0	0
9	IO6		1	1

Pin	Signal	IO Type	50 00 03 03 FF 07 FF 57 = All On	On Power-Up
14	IO1		0	0
13	IO2		0	0
12	IO3		0	0
11	IO4		0	0
10	IO5		0	0
9	IO6		1	1

2.1.1 Test with IO5

Pin	Signal	IO Type	50 00 03 03 FF FF FF AF	50 00 03 03 FF FF 00 50
14	IO1		0	0
13	IO2		0	1
12	IO3		0	1
11	IO4		0	1
10	IO5		0	1
9	IO6		1	1

2.2 IOs with Standard Firmware (STM32F103)



Pin	Signal	IO Type	50 00 03 03 FF 07 00 A8 = All Off	50 00 03 03 FF 07 07 AF = IO4 + IO3 + IO2 ON
14	IO1		0	0
13	IO2		1	0
12	IO3		1	0
11	IO4		1	0
10	IO5		0	0
9	IO6		1	1

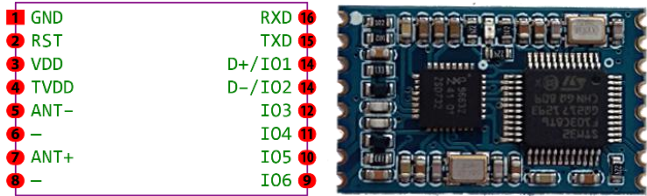
Pin	Signal	IO Type	50 00 03 03 FF 07 FF 57 = All On	On Power-Up
14	IO1		0	0
13	IO2		0	0
12	IO3		0	1
11	IO4		0	1
10	IO5		0	0
9	IO6		0	1

2.2.1 Test with IO5

Pin	Signal	IO Type	50 00 03 03 FF FF FF AF	50 00 03 03 FF FF 00 50
14	IO1		0	0
13	IO2		0	1
12	IO3		0	1

11	IO4		0	1
10	IO5		0	1
9	IO6		1	1

2.3 IOs with PC/SC



Pin	Signal	IO Type	Status without RFID Tag	Status with RFID Tag
14	IO1	USB D+	1	1
13	IO2	USB D-	0	0
12	IO3	Red (R840)	1	0
11	IO4	Green (R840), internal LED	1	0
10	IO5	Blue (R840)	0	0
9	IO6	Output	0	0