



DE-950 User's Manual

(Block Read Version)

DUALi Inc.

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We have our development center in South Korea to provide technical support. For any technical assistance can contact our technical support team as below;

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Revision History

- 2013.01 (Ver. 1.0) : First Release
- 2013.08 (Ver. 1.10) : Explained operation in detail
Increased card reading range
- 2014.04 (Ver. 1.20) : Add LED set option(0xE1, chapter 8.2)
- 2014.04 (Ver. 1.30) : Add automatic card detection disable command(0xEF).
- 2014.05 (Ver. 1.31) : Add explanation for RS-232
- 2014.09 (Ver. 1.40) : Add MIFARE block read function(0xE2)
- 2015.01 (Ver. 1.41) : Fix cable color and number of chapter 6.

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1. Introduction

DE-950 is refined design of proximity reader which supports Contactless (ISO 14443 A/B type, Mifare®, FeliCa™). It also supports 32/34/64/66-bit (26 bit is optional) Wiegand format with a Host communication which is the most widespread system. DE-950 is a IP65 complaint (water proof) reader and it's applicable to various systems such as Access control system, Time attendance system, parking management or e-Payment system.

2. Contents Confirmation

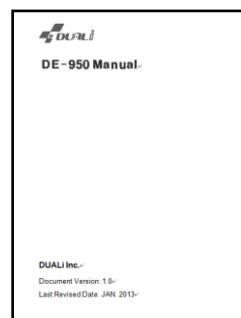
- The following items are contained in DE-950 package.



Reader
(1 ea)



bracket
(1 ea)



Manual
(1 ea)

3*4 Flat head
machine screw



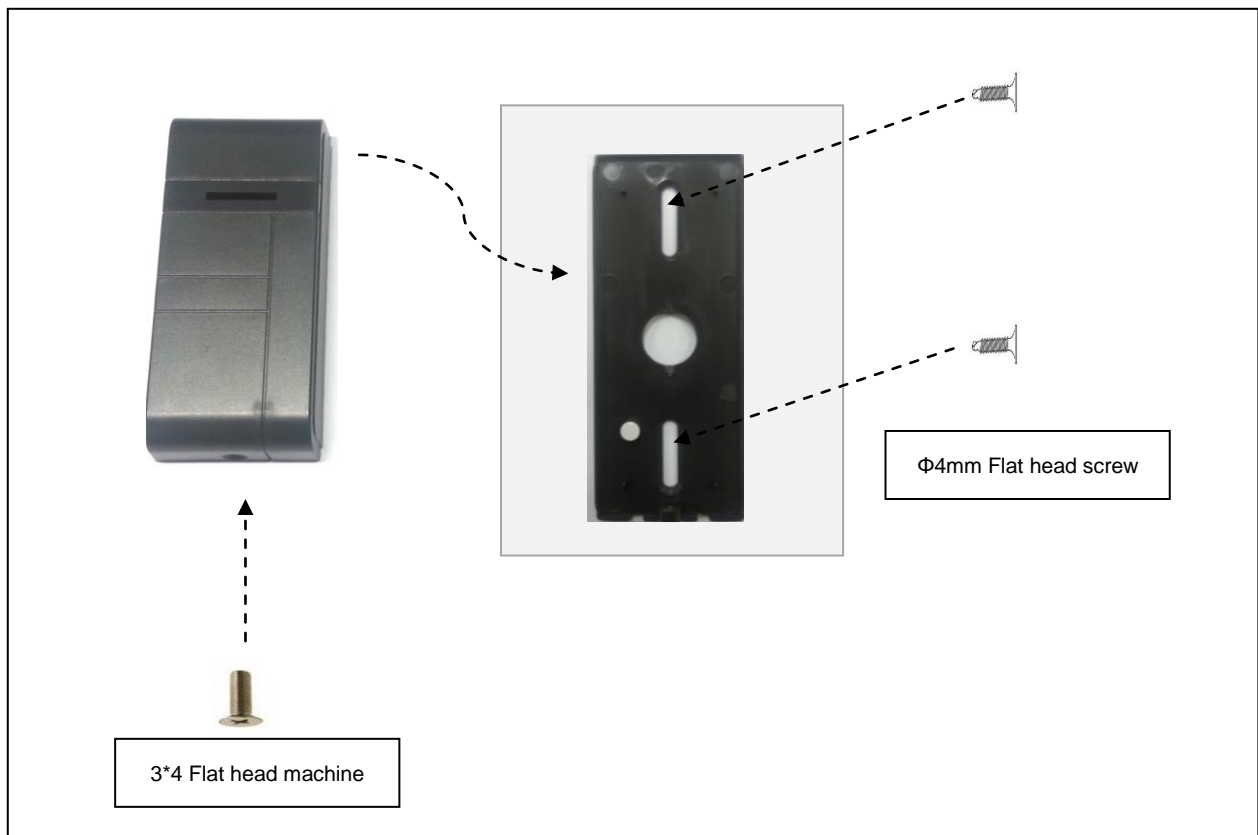
screw
(1 ea)

3. Hardware Specifications

Read Range	Up to 5cm
Input Voltage/Current	DC 7-24V, MAX 200mA(12V)
LED/Beeper	2 LEDs(Red, Blue) / Magnetic Buzzer
Color	BLACK(Body)
Operating Environment	-20℃ ~ +60℃, 10~90% Humidity
Overall Size(WxHxD)	46 x 150 x 20mm
Output Format	32 / 34 / 64/ 66 bit Wiegand, RS-232/485(option)

4. Installation

1. Place the wall mount bracket on the wall and fix it tightly with Screw (Φ 4mm Flat head) -4nos.
2. Connect the power and communication cable to DE-950's Terminal Block.
(Refer to chapter 5. Connection Diagram)
3. Tilt the device slightly and insert to the wall mount from the top. Fix it tightly with 3*4 Flat head machine screw.



<Picture 1.Installation>

※ Caution

- Do not push the device/ wall mount bracket too hard when fixing it to the wall.
- Screw has to be reconsidered depending on the wall's material and condition.
- Please place flat panel between the wall mount bracket and the wall if the wall is not flat. It could cause a problem to assemble the device if the bracket bent.

5. Connection Diagram

Please refer to the below diagram for the connection. (cable length: 50CM)

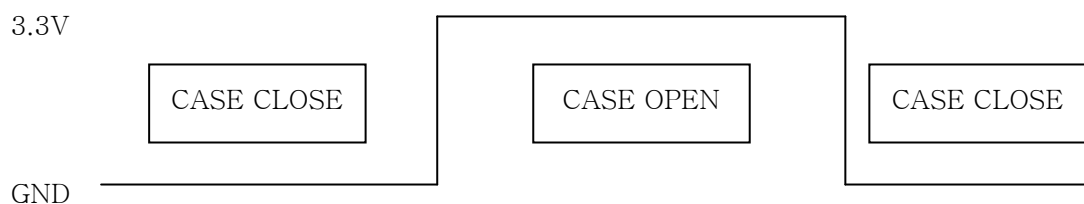


PIN NAME	COLOR	PIN NUMBER
PWR_IN	RED	1
PWR_GND	BLACK	2
RS232_RX	GRAY	3
RS232_TX	PINK	4
WGD_D0	GREEN	5
WGD_D1	WHITE	6
PWR_GND	BLUE	7
LED	BROWN	8
BEEP	YELLOW	9
TAMPER	VIOLET	10
RS485+	ORANGE	11
RS485-	SKY BLUE	12

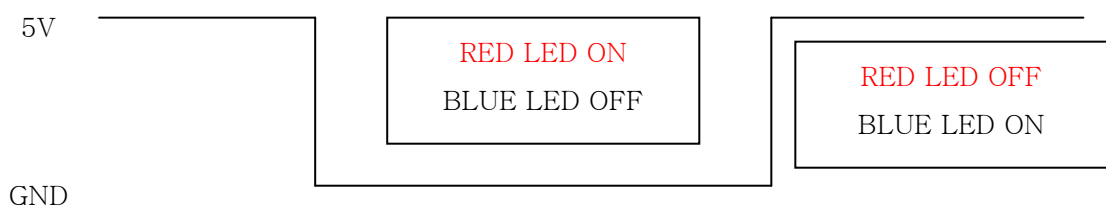


6. Operation & Usage

1. This operation is limited to fixed function version from DUALi only. In case of Firmware Development Kit version, developers can control all as they want
2. Apply power to the Reader, check the Beep sound of buzzer and BLUE LED is turned on. It means this device is working properly
3. When user present (authorized) contactless card to the reader, the reader makes 1 time of beep sound and turns off Blue LED for 0.2 second and turn it on again. It sends Card's data to Access controller through the Wiegand data line. Reader tries to read card every 30 millisecond. Reader will not read card again before the card, which was already used, is removed from the antenna.
4. When an unauthorized card is presented on the reader, Red LED will be blinking.
5. Tamper (TAMP) :
Reader makes alarm when its case is forced to open. It makes TAMPER signal (PIN No-10, VIOLET) to GND when case is opened with beep sound. It recovers to 5V when case is closed.

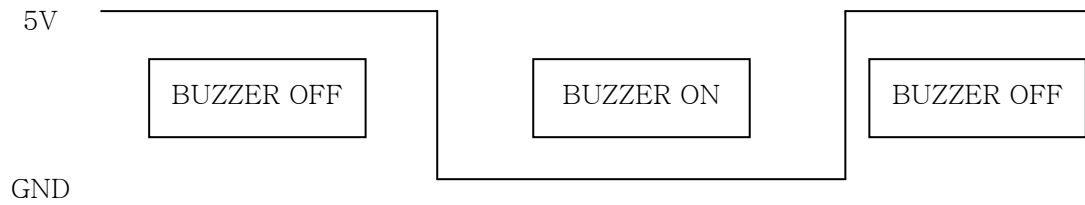


6. LED Control :
Reader turns on RED LED (turns off BLUE LED) while LED signal (PIN No-8, BROWN) from controller is low.



7. Buzzer Control :

Reader makes beep sound while BEEP signal (PIN No-9, YELLOW) from controller is low.



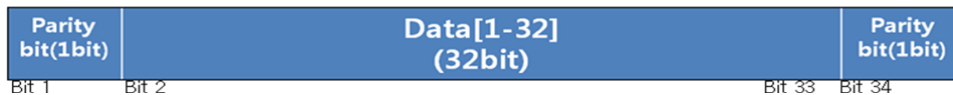
7. Output Format

7-1. Wiegand output format

1. Data format

- Data format can be decided by setting (Refer to Chapter 8. Function configuration)

<34bit> _Default



First Bit 1 : Even parity of bit 2 ~ bit 17
 Data[1-32] : ID number(transmission data)
 Last Bit 34 : Odd parity of bit 18 ~ bit 33

<66bit>



First Bit 1 : Even parity of bit 2 ~ bit 33(Data[1-32])
 Data[1-64] : ID number(transmission data)

FeliCa™ card – IDM data(8bytes)
 Mifare® card – Card serial number(4bytes)+0x00(4bytes)
 Last Bit 66 : Odd parity of bit 34 ~ bit 65(Data[33-64])

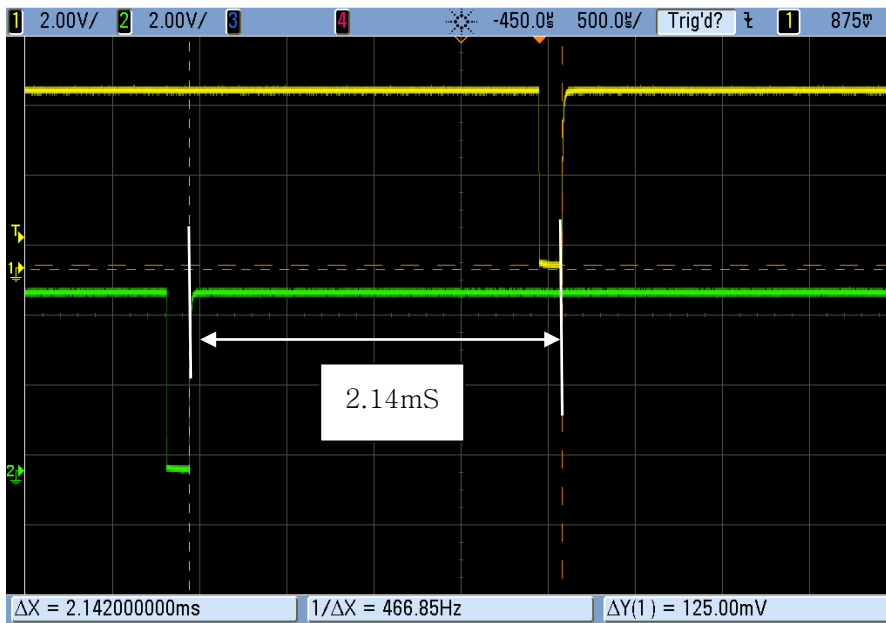
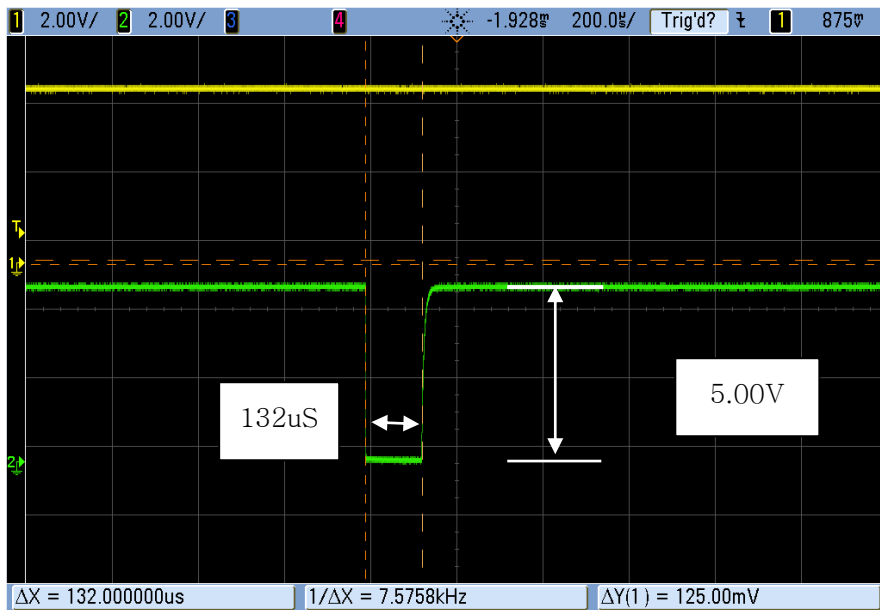
<32bit>

Data[0-31] : ID number(transmission data)

<64bit>

Data[0-63] :
 FeliCa™ card – IDM data(8bytes)
 Mifare® card – Card serial number(4bytes)+0x00(4bytes)

7-2. Wiegand output Timing and Level



8. Function Configuration

8-1. Wiegand option set

Following is the Wiegand communication frame for setting

Since it is saved in flash memory after the first setting, the reader does not need to be set again.

(9600bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA	LRC
0x02	0x00	0x02	0xE0	DATA[0]	LENL ^ CMD ^ DATA[0]

(^ : exclusive oring)

DATA[0]	State	Description
Bit7~4	RFU	RFU
Bit3	0	RFU
	1	RFU
Bit2	0	Parity Send(34 or 66bit) depend on ID bytes(No.1)
	1	Parity Omit(32 or 64bit) depend on ID bytes(No.1)
Bit1	0	Forward ID byte order
	1	Reverse ID byte order
Bit0	0	RFU
	1	RFU

8-2. LED option set

This command sets default LED which will be turned on.

Since it is saved in flash memory after the first setting, the reader does not need to be set again.

(9600bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA[0]	LRC
0x02	0x00	0x02	0xE1	0- BLUE LED ON 1- RED LED ON	LENL ^ CMD ^ DATA[0]

8-3. Automatic Card Detection Disable

This command is used to stop automatic card detection. This command must be used when user want to control DE-950/930 from host device like PC.

User can control reader using "RW_Protocol_spec_XXXXXX.pdf" after sending this command.

User must reboot reader to make it detect card automatically.

(9600bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	LRC
0x02	0x00	0x01	0xEF	0xEE

8-4. MIFARE Block Read Setting

This command is used to read specific block of MIFARE card.

(9600bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA	LRC
0x02	0x00	0x0B	0xE2	Data[0..9]	

Data	Value	Description
Data[0]	0x00	A Type key
	0x04	B Type key
Data[1..6]		6 byte Key data
Data[7]	0	ID is chip serial number
	1~	Block Number where ID exists
Data[8]	0~12(0x0C)	Start position of ID
Data[9]	4 5~16	4 byte UID -> Wiegand 32 or 34bit depend on Parity setting of 8.1 8 byte UID -> Wiegand 64 or 66bit depend on Parity setting of 8.1 (First 8 byte is Wiegand ID when ID length is bigger than 8.) (Send all ID to serial port although ID length is bigger than 8.)

9. Warranty & Service

▸ Warranty and Repair service

- DUALi Inc. warrants to the original consumer or other end user that this product, DE-950, is free from defects in materials and workmanship for a period of 1 year from the date of purchase.

※ **Note** Warranty/non-warranty repair fees do not include any shipping charges.

▸ The damages(defaults) prescribed below are NOT to be covered by warranty.

- User's misuse of part/component.
- Fault by the unqualified user's own intention of repairs.
- Product's inspection requirement.
- Adding certain functions or extension of system.
- Fault by User's misuse against the product's manual.

***Please contact our service team for the technical/ sales supports.**

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