DE-960 User Manual

DUALi Inc.

Document Version: 1.00

Last Revised Date: 16th. DEC 2011

DUALi Inc. reserves the right to make changes to its applications or services or to discontinue any application or service at any time without notice. DUALi provides customer assistance in various technical areas, but does not have full access to data concerning the use and applications of customer's products.

Therefore, DUALi assumes no liability and is not responsible for customer applications or software design or performance relating to systems or applications incorporating DUALi products. In addition, DUALi assumes no liability and is not responsible for infringement of patents and/or any other intellectual or industrial property rights of third parties, which may result from assistance provided by DUALi.

Composition of the information in this manual has been done to the best of our knowledge. DUALi does not guarantee the correctness and completeness of the details given in this manual and may not be held liable for damages ensuing from incorrect or incomplete information. Since, despite all our efforts, errors may not be completely avoided, we are always grateful for your useful tips.
We have our development center in South Korea to provide technical support. For any technical assistance can contact our technical support team as below;

Tel: +82 31 213 0074
e-mail : lab@duali.com

Revision History

- 2016.12.16 (Ver. 1.00) : First Release

CONTENTS

1 Introduction

DE-960 is refined design of proximity reader which supports contactless (ISO14443 A). It supports 32/34/64/66-bit Wiegand format with a host communication which is the most widespread system. It's applicable to various system such as access control, time attendance, parking management or e-ID system.

2 Contents Confirmation

- The following items are contained in DE-960 package.

Reader (1 ea)

Bracket (1 ea)

Manual (1 ea)

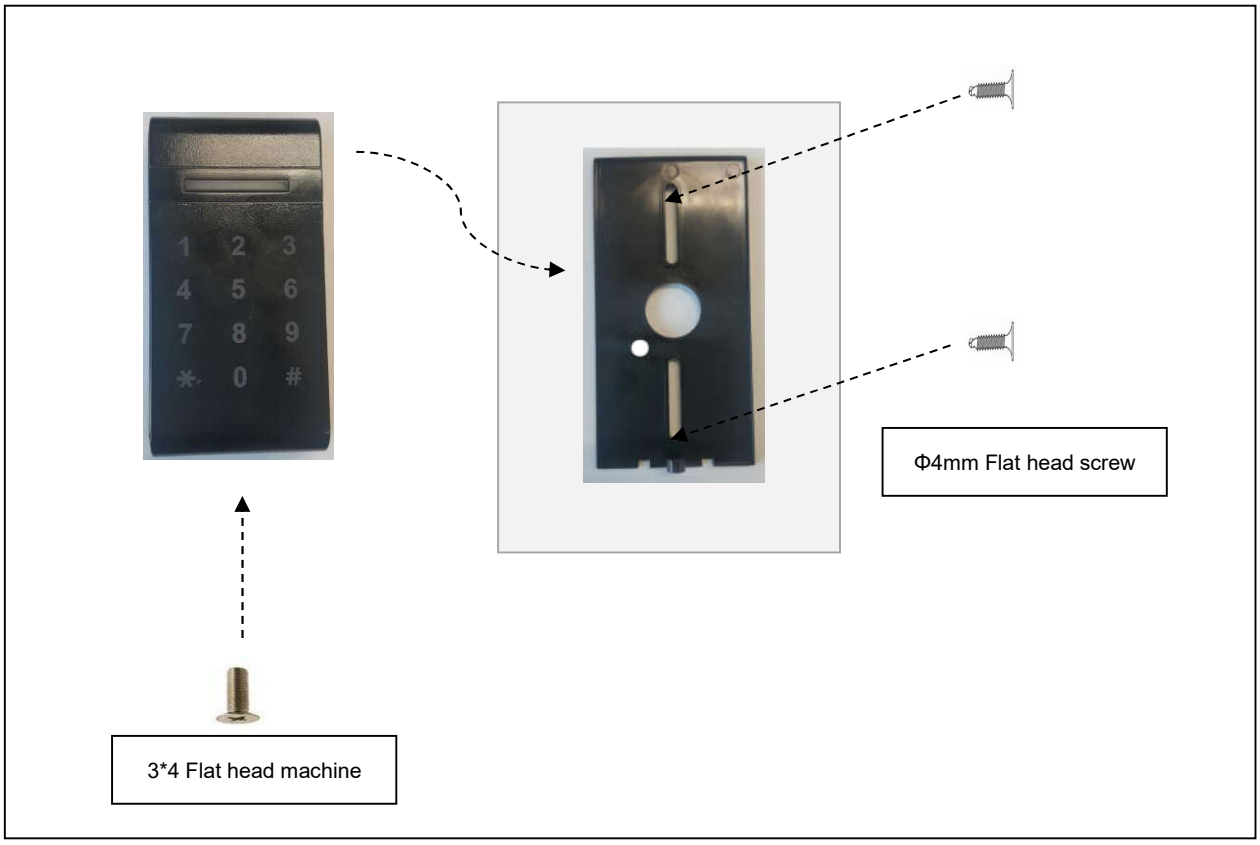
Screw (1 ea)

3 Hardware Specification

Read Range	Up to 5cm
Input Voltage/Current	DC 12V, MAX 150mA(12V)
LED/Beeper	2 LEDs(Red, Blue) / 12 Key LED(White) / Magnetic Buzzer
Color	Black(Body)
Operating Environment	-20℃ ~ +60℃, 10~90% Humidity
Overall Size(WxHxD)	60 x 115 x 25mm
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 (Φ4mm Flat head) – 4nos
2. Connect the power and communication cable to DE-960'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 selected depending on the wall's material and condition
- Place the reader to flat panel between the wall mount bracket and the wall.
  It could cause a problem to assemble the device if the bracket is bent.
- Card reading distance can be short if the wall is made of steel.

5 Connection diagram

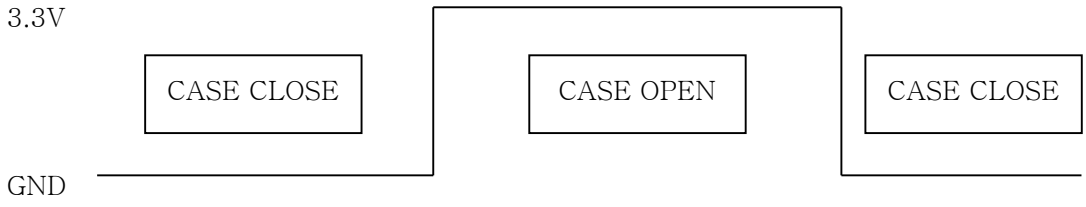
Depending on cable connection, you can make choice among RS-485 / RS-232 / Wiegand. Please refer to the below diagram for the connection.

PIN NAME	COLOR	PIN NUMBER
PWR_IN	RED	1
PWR_GND	BLACK	2
RS232_RX	GRAY	3
RS232_TX	JADE	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. Once input power to device, white LED on KEY pad is turned on and off, after that, BLUE & RED LED are turned on.
2. When user present authorized contactless card to the reader, the reader makes 1 time beep sound and 2 times of turning RED LED. It sends card's data to access controller through Wiegand data line.
3. When an unauthorized card is presented on the reader, RED LED will be blinking.
4. Tamper (TAMP) :

   Reader makes alarm when its CASE is forced to open. It also makes TAMPER signal to access controller. In case of closed CASE, TAMPER line (SKY-Blue Line) shows 0V and otherwise(open) shows 3.3V.

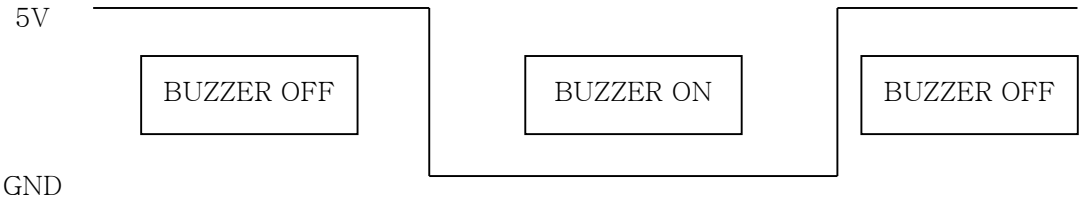


5. LED Control :

   Reader tuns on RED LED when LED Signal(PINK) with 0V. In case of 5V, BLUE LED will be on.

6. Buzzer Control :

Reader makes beep sound when BEEP Signal(BROWN) with 0V.



7 Output format

7-1. Data format

- **Data format can be decided by setting. (Refer to chapter 8)**

<34bit>

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)

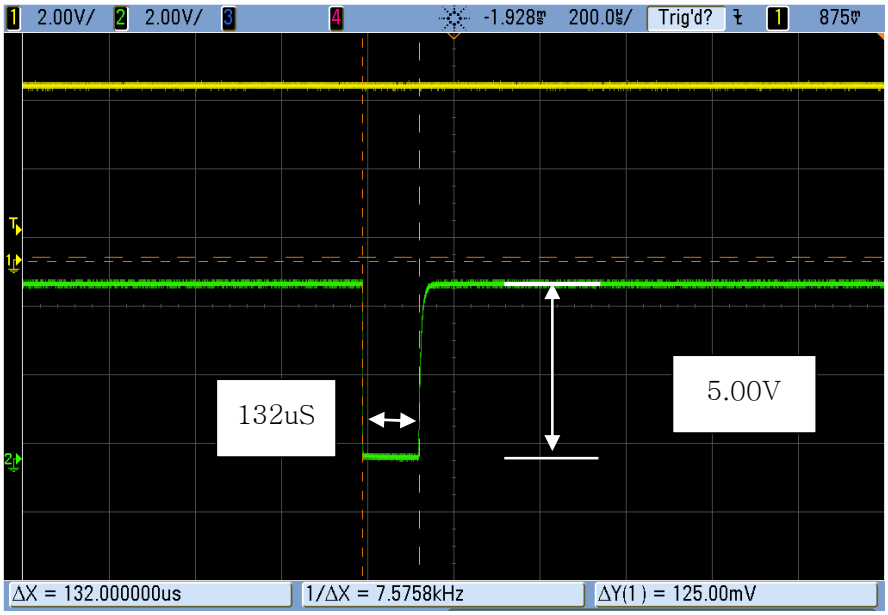
<64bit>

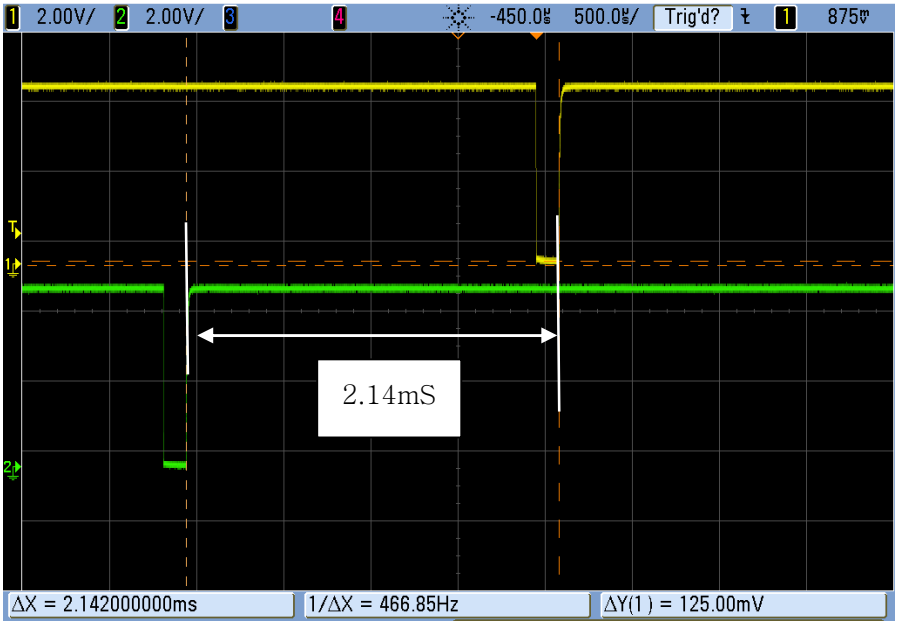
Data[0-63] :

FeliCa™ card – IDM data(8bytes)

Mifare® card – Card serial number(4bytes)+0x00(4bytes)

8 Wiegand output timing and level





9 Function configuration (Communication setting)

9.1 Wiegand option set

Following is the communication frame for wiegand option 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	4byte ID(32 or 34bit) depend on parity setting(No.2)
	1	8byte ID(64 or 66bit) depend on parity setting(No.2)
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	Not Read MIFARE card in Security Mode (Security Mode : SAM authentication for FeliCa, Reader enters security mode when SAM exists when boot.)
	1	Read MIFARE card in Security Mode

9.2 LED option set

Following is the communication frame for LED color 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[0]	LRC
0x02	0x00	0x02	0xE1	0- BLUE LED ON 1- RED LED ON	LENL ^ CMD ^ DATA[0]

9.3 Automatic Card Detection Disable

Following is the communication frame for automatic card detection disable setting

This command controls the automatic card detection function. It is used when controlling DE-960 from host device like PC.

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

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

9.4 KEY Mode option set

Following is the communication frame for Key mode 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	0xE3	0x01	DATA[1]	LENL ^ CMD ^ DATA[0]

(^ : exclusive oring)

DATA[0]	State	Description
0x00	Direct Mode + PIN	Input KEY Direct mode – CARD detect & PIN
0x01	Buffer Mode + PIN	Input KEY Buffer mode – CARD detect & PIN
0x02	Direct Mode	Input KEY Direct mode
0x03	Buffer Mode	Input KEY Buffer mode

9.5 PASS Buffer Length option set

Following is the PASS Buffer 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	0xE3	0x02	DATA[1]	DATA[2]	LENL ^ CMD ^ DATA[0]

(^ : exclusive oring)

DATA[x]	State	Description
DATA[1]	MINIMUM Length	Set password minimum length (Range: 1~11)
DATA[2]	MAXIMUM Length	Set password maximum length (Range: DATA[1]~12)

9.6 KEY Timeout option set

Following is the communication frame for key time out option 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	0xE3	0x03	DATA[1]	LENL ^ CMD ^ DATA[0]

(^ : exclusive oring)

DATA[1]	State	Description
0x01~0x0A	Touch Key Timeout	Touch Key timeout setting (Range: 0x01~0x0A)

9.7 KEY Sensitive option set

Following is the communication frame for Touch Key sensitive option 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	0xE3	0x04	DATA[1]	LENL ^ CMD ^ DATA[0]

(^ : exclusive oring)

DATA[1]	State	Description
0x01~0x04	Touch Key Sensitive	Touch KEY sensitive set (Lower value is more sensitive)

9.8 KEY Push Buzzer option set

Following is the communication frame for Key push buzzer option 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	0xE3	0x05	DATA[1]	LENL ^ CMD ^ DATA[0]

(^ : exclusive oring)

DATA[1]	State	Description
0x00	BUZZER OFF	Touch KEY, buzzer off
0x01	BUZZER ON	Touch KEY, buzzer on

9.9 RF Scan option set

Following is the communication frame for RF Scan 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	0xE3	0x06	DATA[1]	LENL ^ CMD ^ DATA[0]

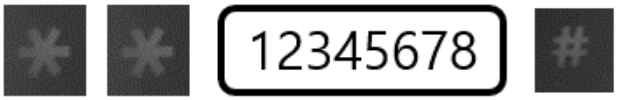
(^ : exclusive oring)

DATA[1]	State	Description
Bit7	0	TYPE-A / MIFARE Scan Off
	1	TYPE-A / MIFARE Scan ON
Bit6	0	TYPE-B Scan Off
	1	TYPE-B Scan ON
Bit5	0	FELICA Scan Off
	1	FELICA Scan ON
Bit4	RFU	RFU
Bit3	0	15693 Scan Off
	1	15693 Scan ON
Bit2 ~ Bit0	RFU	RFU

10 Funtion configuration (KEY setting)

10.1 Enter setting mode

- Through DE-960 Touch KEY, it is possible to enter setting mode.
- How to enter setting mode



1. When press "*" "*" (two times), buzzer sound and it enter "password input mode"
2. Input password (Max. 8 digit)
3. After input, press "#" then RED/BLUE LED will be blinking and finally enter setting mode..
4. Input your password to change.
5. Press "*" to finish.
6. If there is no more input during 10sec, it automatically finishes.

- PASSWORD can be changed through F/W build.

10.2 KEY Mode setting

- When RED/BLUE RED keep blinking, press "1" to enter KEY mode setting menu.
- After entering, press option number below.

KEY	State	Description
1	Direct Mode + PIN	Input KEY Direct mode – CARD detect & PIN
2	Buffer Mode + PIN	Input KEY Buffer mode – CARD detect & PIN
3	Direct Mode	Input KEY Direct mode
4	Buffer Mode	Input KEY Buffer mode

- After press option number and press "#" to save option to flash memory. Then DE-960 will reboot.
- Press"*" to return to setting menu.
- If press the number except 1~4, it will set to No.1(Direct mode + PIN)

10.3 Default LED setting

- When RED/BLUE RED keep blinking, press "2" to enter default LED setting menu.
- After entering, press option number below.

KEY	State	Description
1	Default LED RED	Default LED RED
2	Default LED BLUE	Default LED BLUE

- After press option number and press "#" to save option to flash memory. Then DE-960 will reboot.
- Press"*" to return to setting menu.
- If press the number except 1~2, it will set to No.1(Defualt LED RED)

10.4 KEY Push Buzzer setting

- When RED/BLUE RED keep blinking, press "3" to enter KEY push buzzer setting menu.
- After entering, press option number below.

KEY	State	Description
1	KEY Push Buzzer ON	Buzzer turns on when press KEY
2	Key Push Buzzer OFF	Buzzer turns off when press KEY

- After press option number and press "#" to save option to flash memory. Then DE-960 will reboot.
- Press"*" to return to setting menu.
- If press the number except 1~2, it will set to No.1(KEY Push Buzzer ON)

10.5 Wiegand Length setting

- When RED/BLUE RED keep blinking, press "4" to enter Wiegand setting menu.
- After entering, press option number below.

KEY	State	Description
1	Wiegand 32Bit	Card Wiegand Data 32bit
2	Wiegand 34Bit	Card Wiegand Data 34bit
3	Wiegand 64Bit	Card Wiegand Data 64bit
4	Wiegand 66Bit	Card Wiegand Data 66bit

- After press option number and press "#" to save option to flash memory. Then DE-960 will reboot.
- Press"*" to return to setting menu.
- If press the number except 1~4, it will set to No.1(Card Wiegand Data 32bit)

10.6 Wiegand Data Foward / Reverse setting

- When RED/BLUE RED keep blinking, press "5" to enter Wiegand setting menu.
- After entering, press option number below.

KEY	State	Description
1	Data Send Fowared	Wiegand Data Sending Forward
2	Data Send Reverse	Wiegand Data Sending Reverse

- After press option number and press "#" to save option to flash memory. Then DE-960 will reboot.
- Press"*" to return to setting menu.
- If press the number except 1~2, it will set to No.1(Wiegand Data Sending Forward)

11 Warranty & Service

‣ Warranty and Repair service

- DUALi Inc. warrants to the original consumer or other end user that this product, Dragon BT, 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 shipping charges.

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

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

PRECAUTIONS

- Do not drop the device.
- Do not modify, repair, or disassemble.
- Do not expose directly to water, alcohol, benzene, etc for cleaning.
- Do not expose directly to flammables.
- Do not place or keep the device near flammables.
- Keep the device away from excessive humidity and dust.
- Do not place heavy objects on the device.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

12 Certifications

FCC STATEMENT

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

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

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

DUALi Inc.

1-309 Innoplex, 552 Wonchoen-dong, Youngtong-gu,

Suwon, Gyeonggi-do, Korea (zip: 443-380)

Tel : +82 31-213-0074

Fax : +82 31-213-0078

E-mail : lab@duali.com

Web-site : http://www.duali.com