

DQ-MINI

User Manual

DUALi Inc.

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- 2018.10.16 (Ver. 1.00) : First Release

- 2018.11.13 (Ver. 1.01) : Mifare Block read setting change
Mifare, Wiegand setting show command add

- 2019.01.30 (Ver. 1.02) : Wgd Parity,reverse command correct

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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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01. Introduction

DQ-MINI is a wiegand access control reader based on 13.56 Mhz contactless card communication technology with stylish and rugged design. And it also can read QR code and 1D/2D barcode. **It can be installed stably both indoor and outdoor.** The ideal combination of NFC & QR reader could upgrade your application into another level. The reader is designed for wall mounting type of Access / Time attendance & parking management systems, and etc.

02. Specification

Communication Interface	Wiegand - 32 / 34 /56/ 58/ 64/ 66 bit RS-232 – 115200bps RS-485 – 115200bps
Operating Frequency	13.56MHz
Credential Type	Contactless > ISO 14443 TYPE A and B > Mifare™ > FeliCa® > ISO 15693 > ISO 18092 (NFC) [Option] Contact (SAM) > ISO7816 Class A (5V) 2 SAM Card Slot
1D/2D QR Recognizable spec	UPC/EAN, UPC/EAn with Supplementals, Bookland EAN, ISSN, UCC Coupon Extended Code, Code128, GS1-128, ISBT 128, Code 39, PDF417, MicroPDF417, Composite Codes, Data Matrix, Maxicode, Qr Code, micro QR, Aztec
Indicator	LED (RED /BLUE) Magnetic Buzzer
Power Supply	12VDC (9- 12 VDC also available) Linear supply recommended, 150 mA @ 12 VDC
Operating Condition	> -4° to 158°F (-20° to 70°C guaranteed) > 5% to 90% relative humidity
Storage Condition	> -4° to 158°F (-20° to 80°C) > > 5% to 90% relative humidity
Housing Material	PC (polycarbonate)
Dimensions	99.3(mm) x 91.9(mm) x 88.4(mm)
Weight	169.6g
Cable length	1000(mm)
Certifications	FCC Certification (US), CE(EU), IP65 compliant

03. Contents Confirmation



< DQ Mini with Wiegand or USB cable >

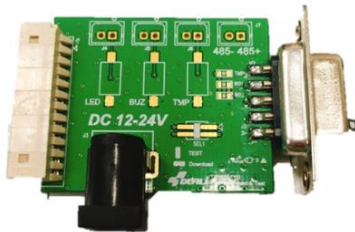


< Wall bracket >



<3x5 Flat head screw >

<Option>



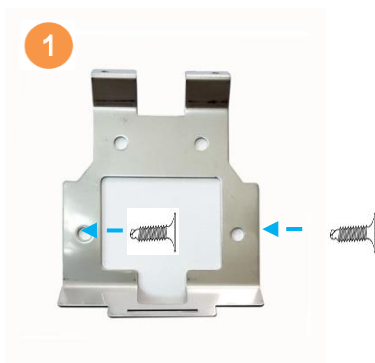
PC Test/FW download zig

04. Appearance & Installation

04.1 DQ MINI Feature & Dimension



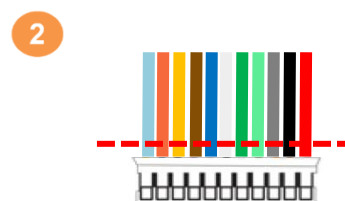
04.2 Mounting DQ Mini on the wall



Φ4mm Flat head screw

<Bracket >

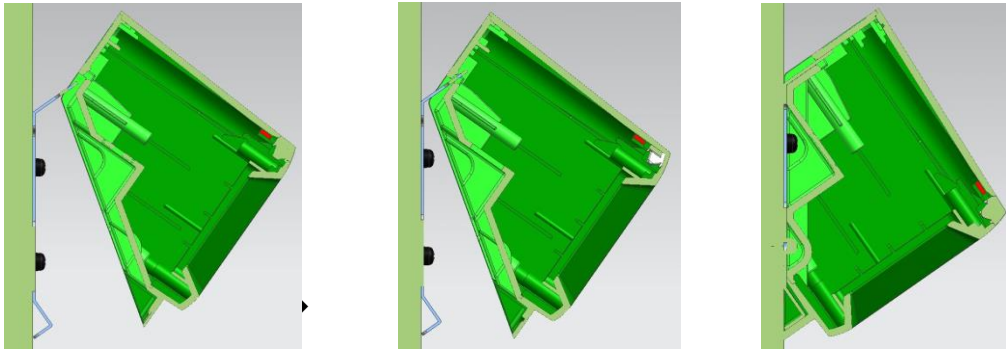
Place the provided wall mount bracket on the wall and fix it tightly with screw (Φ4mm Flat head)



Connect the power and communication cable to DQ MINI's terminal block.

In case you don't use the cable as it is shipped, you could cut off the end of the cable and use only the wire that you need for connection.

3



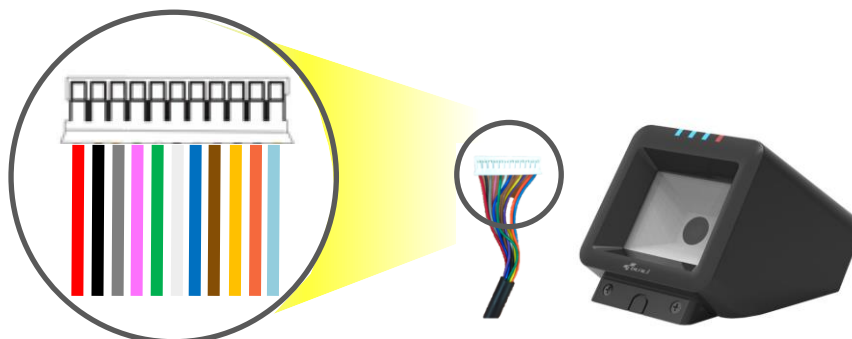
< Side View >

Tilt the device slightly and insert to the wall mount from the top as above step. Fix it tightly with 3*4 flat head machine screw.

※ **Caution**

- Do not push the 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 or metal.

05. Connection Diagram



PIN NAME	COLOR	PIN NUMBER
PWR_IN	RED	1
PWR_GND	BLACK	2
RS232_RX	GRAY	3
RS232_TX	PINK or 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-	SKYBLUE	12

06. Operation & Usage

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 (VIOLET) shows 0V and otherwise (open) shows 5V.



LED Control:

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



Buzzer Control:

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



07. Output Format

[Data format]

- Data format can be decided by setting. (Refer to chapter 10)

- <34 bit>

Parity Bit (1bit)	Data [1~32] (32bit)	Parity Bit (1bit)
Bit 1	Bit 2	Bit 34

First Bit (Parity) : Even parity of bit 2 ~ bit 17

Data [1-32] : ID number (transmission data)

Last Bit (Parity) : Odd parity of bit 18 ~ bit 33

<66 bit>

Parity Bit (1bit)	Data [1~64] (64bit)	Parity Bit (1bit)
Bit 1	Bit 2	Bit 66

First Bit (Parity): Even parity of bit 2 ~ bit 33

Data[1-64] : ID number(transmission data)

FeliCa™ card – IDM data(8bytes)

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

Last Bit (Parity) : Odd parity of bit 34 ~ bit 65

<32bit>

Data[1-32] : ID number(transmission data)

<64bit>

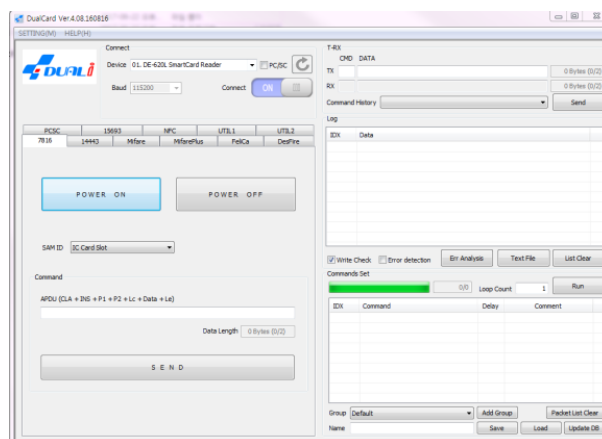
Data[1-64] :

FeliCa™ card – IDM data(8bytes)

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

08. Function configuration (Communication setting)

Changing the reader settings is also possible using the SDK (DualCard program) provided by DUALi. You can easily change the setting of DQ-MINI by executing the corresponding command referring to the communication frame below. (For more information on dual cards, please refer to DUALi SDK Manual.)



※ STX, LENH (Length High) and LENL (Length Low) value of each communication frame are automatically calculated in the dual card program. Just input corresponding value on each CMD/ DATA fields.

08.1 Wiegand option set (Parity, Reverse)

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.

(115,200bps, 8 data, no parity, 1 stop bit)

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

(^: exclusive oring)

DATA[0]	State	Description
Bit0	-	RFU
Bit1	00	Reverse OFF(Default)
	01	Reverse ON
Bit2	00	Parity ON(Default)
	01	Parity OFF
Bit3	00	Zero padding to LSB(Default)
	01	Zero padding to MSB
Bit4~7	03~08	04: Send Wiegand 32/34 Bit 07: Send Wiegand 56/58 Bit 08: Send Wiegand 64/66 Bit Other number will be send 64/66 Bit

※ This command is available after F/W version 181111

Before version can change only Bit 0 and Bit 1



Tip – To change the Wiegand option to 32bit, parity, non reverse, LSB zero pad

The screenshot shows the T-RX interface with the following details:

- T-RX Section:**
 - CMD:** E0
 - DATA:** 40
 - RX:** 00
 - Send button:** A blue button labeled "Send" is highlighted with a dashed border.
- Log Section:**

IDX	Data
1	=>E040
2	<=>00

08.2 LED option setting

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.

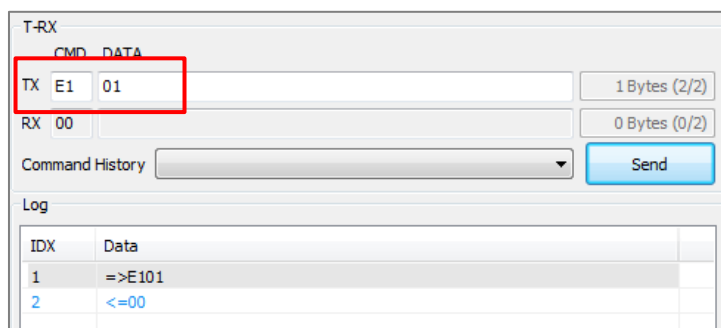
(115,200bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA[0]	LRC
0x02	0x00	0x02	0xE1	0x00 > BLUE LED Default 0x01 > RED LED Default	$LENH \wedge LENL \wedge CMD \wedge DATA[0]$

DATA[0]	State	Description
Bit0	00	Default LED BLUE
	01	Default LED RED



Tip – To change the LED option to RED LED



T-RX

CMD DATA

TX E1 01 1 Bytes (2/2)

RX 00 0 Bytes (0/2)

Command History [dropdown] Send

Log

IDX	Data
1	=>E101
2	<=00

08.3 Mifare KEY type, Block number, ID position, Wiegand format option set

Following is the communication frame for Mifare KEY type, Mifare block number, Mifare ID position, Wiegand format option set. Since it is saved in flash memory after the first setting, the reader does not need to be set again.

(115,200bps, 8 data, no parity, 1 stop bit)

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

(^: exclusive oring)

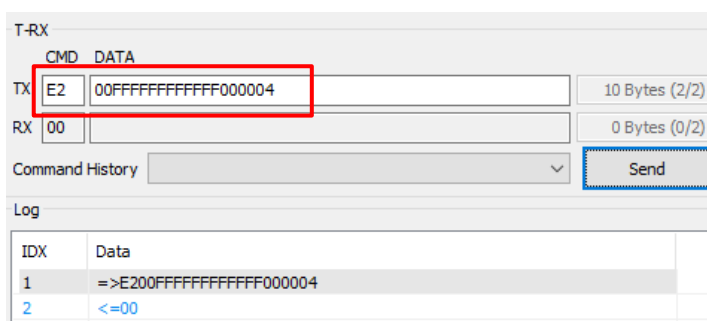
※ Wiegand 34 Bit, 48 Bit, 66Bit is following wiegand parity option of command 0xE0 bit2

DATA[x]	State	Description
DATA[0]	Mifare KEY type	0: A KEY 1: B KEY
DATA[1..6]	Mifare Key	Default Key is 0xFFFFFFFFFFFF
DATA[7]	Mifare Block Number	Mifare Block Number: 0 ~ 0xFF (0 = UID)
DATA[8]	Mifare ID Position	ID Position
DATA[9]	Wiegand Length	Mifare Data length:



Tip- To set Mifare Reading condition as

1) A KEY 2) KEY :0xFFFFFFFFFFFF 3)Block num : 0 4)Position :0 5)len :4



08.4 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

(115,200bps, 8 data, no parity, 1 stop bit)

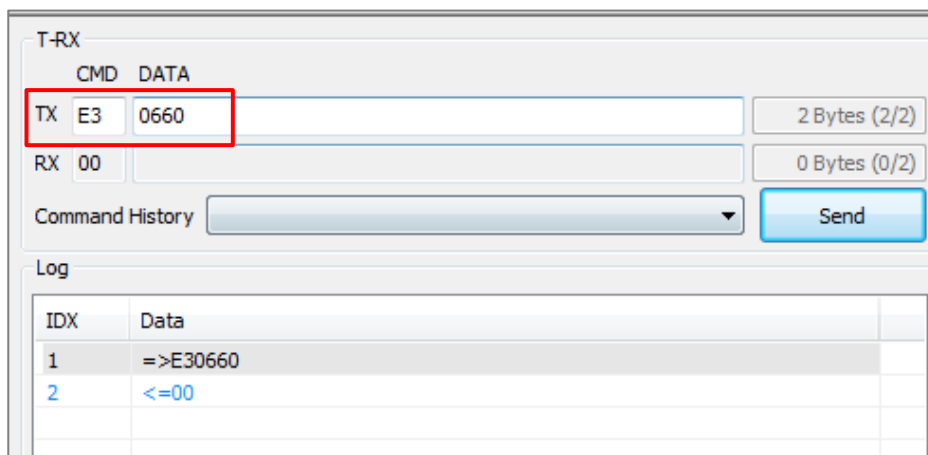
STX	LENH	LENL	CMD	DATA[0]	DATA[1]	LRC
0x02	0x00	0x02	0xE3	0x06	DATA[1]	LENH ^ LENL ^ CMD ^ DATA[0] ^ DATA[1]

(^: exclusive oring)

DATA[1]	Description
0x80	TYPE-A and MIFARE Scan ON
0x40	TYPE-B Scan ON
0x20	Felica Scan ON
0x08	15693 Scan ON



Tip – To set the reader to read FeliCa™ and TypeB



08.5 QR Mode option set

Following is the communication frame for QR mode setting. Since it is saved in flash memory after the first setting, the reader does not need to be set again.

(115,200bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA[0]	DATA[1]	LRC
0x02	0x00	0x02	0xE4	0x00	DATA[1]	LENH^LENL ^ CMD ^ DATA[0]^DATA[1]

(^: exclusive oring)

DATA[1]	State	Description
0x00	Presentation mode	QR scan mode change to Presentation mode
0x01	Manual Trigger mode	QR scan mode change to Manual trigger mode



Tip – To change the QR Mode to Presentation mode

T-RX

	CMD	DATA	
TX	E4	0000	2 Bytes (2/2)
RX	00		0 Bytes (0/2)

Command History Send

Log

IDX	Data
1	=>E40000
2	<=<00

08.6 QR Reading timeout

Following is the communication frame for same QR reading timeout setting. Since it is saved in flash memory after the first setting, the reader does not need to be set again.

(115,200bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA[0]	DATA[1]	LRC
0x02	0x00	0x02	0xE4	0x01	DATA[1]	LENH^LENL ^ CMD ^ DATA[0]^DATA[1]^DATA[2]

(^: exclusive oring)

DATA[1]	State	Description
0x05~0x32	Timeout Parameter	Set same QR reading timeout (Range: 05~0x32(=50)) Each numbers are automatically multiplied by DQ-MINI



Tip – To set the same QR read timeout for 1.6s(1600ms)

T-RX

CMD DATA

TX E4 0110 2 Bytes (2/2)

RX 00 0 Bytes (0/2)

Command History Send

Log

IDX	Data
1	=>E40110
2	<=>00

08.7 QR scan interval set

Following is the communication frame for QR Scan interval option setting. Since it is saved in flash memory after the first setting, the reader does not need to be set again.

(115,200bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA[0]	DATA[1]	LRC
0x02	0x00	0x02	0xE4	0x02	DATA[1]	$LENH \wedge LENL \wedge CMD \wedge DATA[0] \wedge DATA[1]$

(^ : exclusive oring)

DATA[1]	State	Description
0x02~0x64	QR Scan interval	QR Scan Interval setting(Range: 0x05~0x64(=100)) Each numbers are automatically multiplied by DQ-MINI

*** THIS MODE IS ONLY WORK ON QR MANUAL TRIGGER MODE**



Tip – To set the QR scan interval to 0.05s(50ms)

T-RX

	CMD	DATA	
TX	E4	0205	2 Bytes (2/2)
RX	00		0 Bytes (0/2)
Command History			Send

Log

IDX	Data
1	=>E40205
2	<=>00

08.8 QR data send channel set

Following is the communication frame for QR data send channel set. Since it is saved in flash memory after the first setting, the reader does not need to be set again

(115,200bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA[0]	DATA[1]	LRC
0x02	0x00	0x02	0xE4	0x03	DATA[1]	LENH ^ LENL ^ CMD ^ DATA[0] ^ DATA[1]

(^: exclusive oring)

DATA[1]	Description
0x01	Wiegand Send ON
0x02	RS-232 Send ON
0x04	RS-485 Send ON

※ Default setting is Wiegand and RS-232 send ON



Tip – To set the QR data send via Wiegand and RS-232

T-RX

	CMD	DATA	
TX	E4	0303	2 Bytes (2/2)
RX	00		0 Bytes (0/2)

Command History Send

Log

IDX	Data
1	=>E40303
2	<=>00

08.9 QR data Output format set

Following is the communication frame for QR data output format set. Since it is saved in flash memory after the first setting, the reader does not need to be set again

(115,200bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA[0]	DATA[1]	LRC
0x02	0x00	0x02	0xE4	0x04	DATA[1]	LENH ^ LENL ^ CMD ^ DATA[0] ^ DATA[1]

(^: exclusive oring)

DATA[1]	Description
0x00	Output format HEX
0x01	Output format ASCII



Tip – To set the QR data output format to HEX

T-RX

	CMD	DATA	
TX	E4	0400	2 Bytes (2/2)
RX	00		0 Bytes (0/2)

Command History Send

Log

IDX	Data
1	=>E40400
2	<=>00

08.10 QR Factory reset

Following is the communication frame for QR setting rollback to factory setting. Since it is saved in flash memory after the first setting, the reader does not need to be set again

(115,200bps, 8 data, no parity, 1 stop bit)

STX	LENH	LENL	CMD	DATA[0]	DATA[1]	DATA[2]	LRC
0x02	0x00	0x02	0xE4	0x06	0xFF	0xFE	LENH^ LENL ^ CMD ^ DATA[0] ^DATA[1]

(^: exclusive oring)

※ QR Factory Reset is reset for below options

- QR Mode change to Presentation mode
- QR timeout change to 150ms
- QR trigger scan time change to 50ms
- QR send channel change to Wiegand and RS-232
- QR dataformat change to HEX

After send factory reset command, play buzzer « DO » 5-times and « SOL » 5-times

And perform a device reset automatically.



Tip – To being a QR factory reset

After perform a factory reset, device will be reset automatically

T-RX

CMD DATA

TX E4 06FFFE 3 Bytes (2/2)

RX 0 Bytes (0/2)

Command History

Log

IDX	Data
1	=>E406FFFE
2	<=0x3f1(USB_READ_ERROR)

08.11 Mifare Block setting and Wiegand setting Inquire

Following is the communication frame for Mifare block and wiegand setting inquire command. It shows in reply

(115,200bps, 8 data, no parity, 1 stop bit)

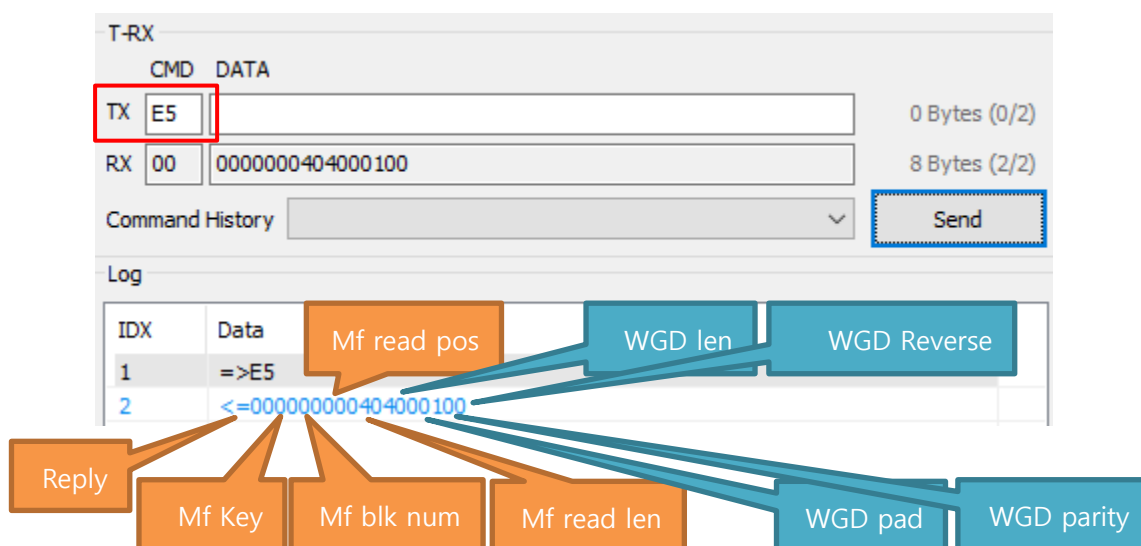
STX	LENH	LENL	CMD	DATA[0]	LRC
0x02	0x00	0x02	0xE5	-	$LENH \wedge LENL \wedge CMD \wedge DATA[0] \wedge DATA[1]$

(^: exclusive oring)

Reply	Description
Byte 0	Reply status : 0x00 is OK
Byte 1	Mifare Key type
Byte 2	Mifare read block number
Byte 3	Mifare ID read position
Byte 4	Mifare ID read length
Byte 5	Wiegand length
Byte 6	Wiegand zero padding status
Byte 7	Wiegand parity status
Byte 8	Wiegand reverse status



Tip – To see a Mifare block and Wiegand setting in current device



The screenshot shows a software interface for sending commands to a device. The TX field contains 'E5' and the RX field contains '00 00000000404000100'. A 'Send' button is visible. Below the interface is a 'Log' table with two entries:

IDX	Data
1	=>E5
2	<=>0000000000404000100

Callouts from the log entry 2 point to various parts of the data: 'Mf read pos' points to the first two zeros; 'Mf Key' points to the next two zeros; 'Mf blk num' points to the next eight zeros; 'Mf read len' points to the '40' hex value; 'WGD len' points to the next '40' hex value; 'WGD Reverse' points to the next two zeros; 'WGD pad' points to the next two zeros; and 'WGD parity' points to the final '100' hex value.

09. 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



10. Warranty & Service

Warranty and Repair service

- DUALi Inc. warrants to the original consumer or other end user that this product, **DQ MINI**, 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.

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

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