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AMR170 Series NFC Reader
User Manual

Document History

Description	Model
Original Release - Firmware version 1.0.7	AMR171,AMR175
Revised Oct 2013 Firmware version 2.1.2	AMR171,AMR175
Revised Jan 2014 Firmware version 2.13	AMR171,AMR175
Revised Apr 2014 Firmware version 2.15	AMR171,AMR175
Revised Jan 2016 Include FCC statement	AMR171,AMR175

Federal Communication Commission Interference Statement

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 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.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

1.1 AMR170 Series NFC Reader Overview

The AMR170 Series NFC Reader is a new generation NFC card reader. The AMR170 Series NFC reader can read a wide range of contactless smart card covering single size UID card to double size UID card. Card ID data can be output via industry standard Wiegand or Asis Proprietary RS485. Both models are available to cater for various modes of security and operation needs.

Model	LCD	Keypad	LED	Buzzer
AMR171	n/a	n/a	yes	yes
AMR175	yes	yes	yes	yes

Table 1 Model Components

1.2 Reader Wiring and Color Code

Figure 1 and 2 illustrates the Connection between the Smartcard reader and the host controller. A recommended color code is shown in Table 2.

Terminal Point Label	Description	Recommended Cable Color
Dev+	RS485+	Blue
Dev-	RS485-	Grey
+V	+12VDC	Red
GND	DC Ground	Black
D0	Wiegand Data 0	Green
D1	Wiegand Data 1	White
ERL	Red LED	Brown
OKL	Green LED	Orange
BUZ	Buzzer	Yellow
	Hold	Purple

Table 2 Wiring and Cable Color code

1.3 DIP Switch Setting

AMR171/175 series reader has 8 way DIP switch with function as show in below table.

Bit	Label	Function in RS485	Function in Wiegand
1	A0	Address bit 0	Card format setting
2	A1	Address bit 1	Card format setting
3	A2	Address bit 2	Card format setting
4	A3	Address bit 3	Card format setting
5	Mode RS485/ Wiegand	OFF – Wiegand, ON – RS485	
6	8/4 Byte	OFF – 8 byte, ON – 4 byte	
7	CSN/CAN	OFF – CSN, ON – CAN	
8	TST	OFF – Run, ON - Testing	

Table 3 Dip Switch function explain

Note: Bit 7 CAN refer to Card Application Number found on Ez-Link card.

	Bit	Bit 1	Bit 2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit 8
	Label	A0	A1	A2	A3		Refers to Table 3 for other DIP Switch Setting.		
Hex Address	80	0	0	0	0	1			
	81	1	0	0	0	1			
	82	0	1	0	0	1			
	83	1	1	0	0	1			
	84	0	0	1	0	1			
	85	1	0	1	0	1			
	86	0	1	1	0	1			
	87	1	1	1	0	1			

Table 4 RS485 Readers Address Dip Switch Setting

DIPSW	DIP1	DIP2	DIP3	DIP4	DIP5	DIP6	DIP7	DIP8
Bit Format	Wiegand setting				OFF Wiegand			
26bit	off	off	off	off				
32bit	on	off	off	off				
32bit(8bit)	off	on	off	off				
34bit	on	on	off	off		off = 64bit RS485	off = CSN RS485	off = Run
37bit	off	off	on	off				
37(8digit)	on	off	on	off	Wiegand =Off			
40bit	off	on	on	off				
40bit(8digit)	on	on	on	off				
56bit	off	off	off	on		on= 32bit RS485	on = CAN RS485	on= test
64bit	on	off	off	on				
80bit	off	on	off	on				
168bit(ASIS)	on	on	on	on				

Table 5 Wiegand bit format Dip Switch setting

Note : Since the Contactless SmartCard CSN is 32 bit can be up to 10 digits decimal when converted. This is the solution to truncate the CSN and provide a result that once converted, it only give maximum of 8-digit decimal. The 37 bit odd and even priority bit is a result of getting the first and second half of total bit length.

1.4 Installation and Mounting Instruction

Identify the reader mounting location. The reader may install onto any surface, including metal.

Remove the snap on cover and use the reader as a template, draw the mounting hole position onto the mounting surface. Drill 2 appropriate holes to install the reader.

Drill a 25mm hole for the cable.

Connect the external (site) cable to the terminal block on the reader according to the wiring code below. Double-check the wiring connection.

Replace the snap on cover and tighten it with the screw provided.

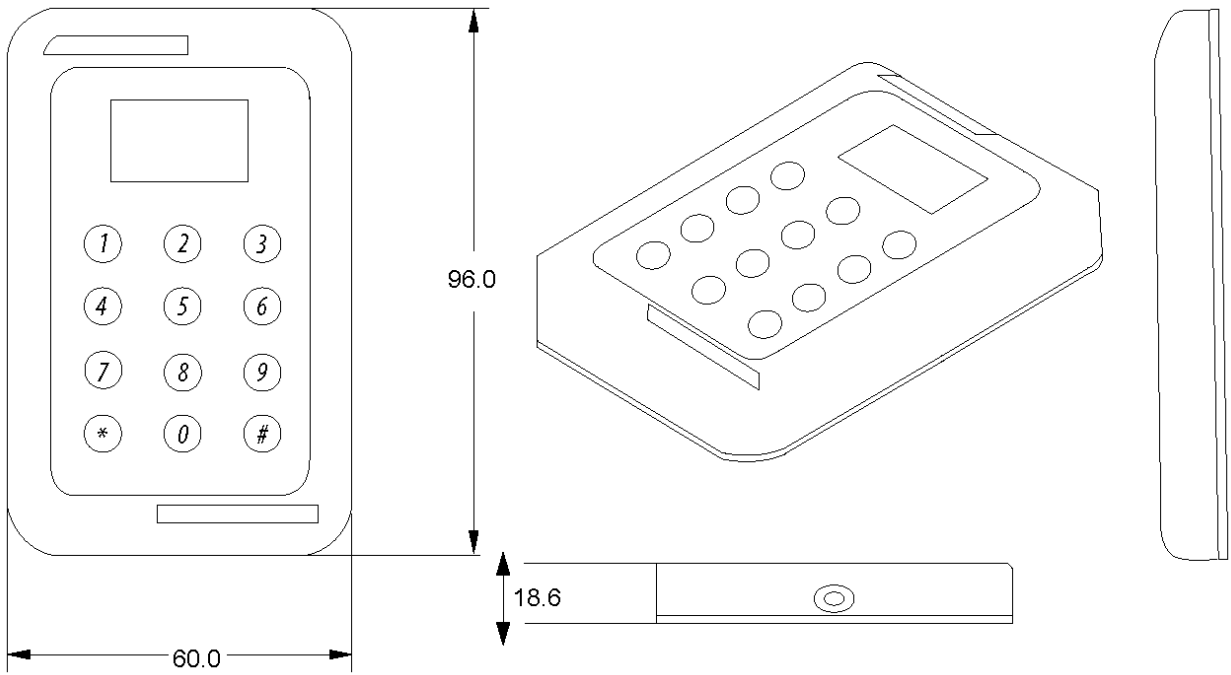Switch on the power to test the reader and observe.
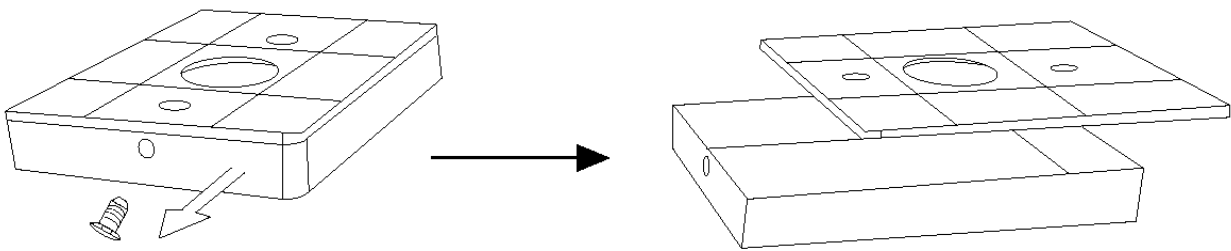
Figure 1 Physical Dimension

Figure 2 Removal of Cover

To remove the reader's cover, unscrew the screw in the bottom and flip open the cover.
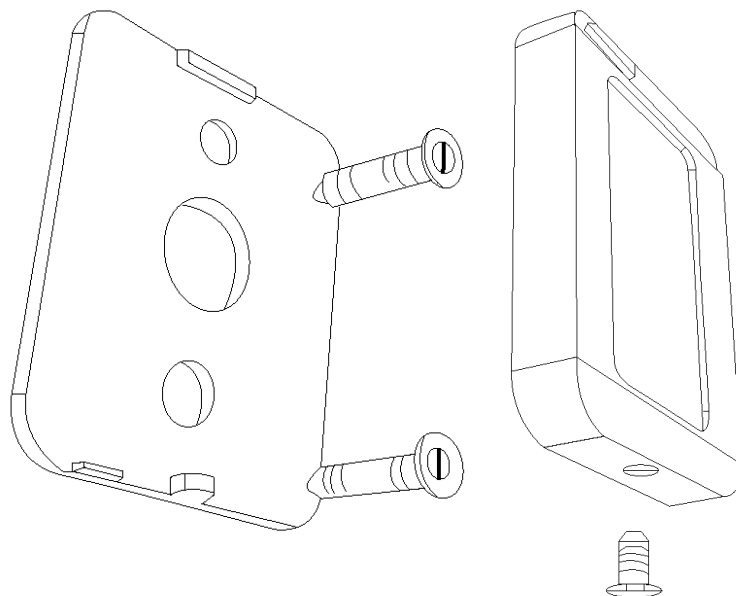

Figure 3 Mounting Method

1.5 Operation Guide

The AMR170 series reader must work with the ACU controller (it cannot operate by itself). The reader allows user to access by Card only, Details of operation please refer to IBSS and/or ACU manual.

Figure 4 Presenting Cards to Reader

Keeping the card in parallel to the AMR17x reader a maximum read range can be obtained. The Reader will still be able to read Card when the card is presented at an angle but this will result in the reducing of read range.

Card and PIN operation (Model 175)

a) When the Green Led is blinking after presenting card, the means that PIN is request. Key in PIN and follows by "#" key

b) Key in PIN + 1 for PIN DURESS (Example PIN is 1234, for duress activation, key pin 1235)   Note that the maximum PIN is up to 6 digit. When the reader is powered-up, the LED and the Buzzer will respond.

Description	Buzzer response (AMR171/175)	LED Response (AMR171/175)	LCD Display (For AMR175 only)
a) Upon Power Up the Reader **N is setting on the DIP switch.	The buzzer will beep (N+1) time accord to the DIP switch setting	Reader's Amber LEDs Blink (N+1) times	Model No Reader Address Version
b) Reader Ready	Silent	Red LED always 'ON' Green LED Short blink at every 3 secs interval	DD/MM/YY / 00:00:00 Ready

c) Reader Alarm & Event Message on LCD Display (AMR175 only)

Access Grant	Buzzer Beep once	Green LED Blink once	**Granted**
Access Denied	Buzzer Beep once	Red LED Blink once	**Denied**
Access Invalid	Buzzer Beep once	Red LED Blink once	**Invalid**
Door Open Too Long	Buzzer Beeping	Red LED Blinking	**DOTL**
Door Force Open	Buzzer Beeping	Red LED Blinking	**Door Force**
Free Access	Silent	Green LED ON	**unlocked**
Door Locked	Silent	Red LED ON	**Locked**
Fire Activated	Buzzer Beeping	Red LED Blinking	**Fire Alarm**
Box Tamper	Buzzer beeping	Red LED Blinking	**Box-Tamper**
Pin Mode	Buzzer beeping	Green LED Blinking	**Enter PIN**
Pre-Alarm	Buzzer beeping	Red LED Blinking	**Pre-Alarm**

Radio Frequency Interference

Devices generate RF noise that may interfere with the reception of the signal
from the access card. This will result in the reduction of read range. Examples of
devices are radios, televisions, and cellular phones. The read range is affected
by the amount of interference (noise) in the area. The reader should mount more
than 1.5m away from the any devices that emits RF that may interfere with the
signal received from the access control cards.

1.6 Package List - AMR171/175 Reader

Item Description Qty. Complete with snap on cover 1 Mounting cover screw, M3 1 Installation and this
document.

1.7 Product Electrical Specification

Power Supply (Recommend)	Regulated linear power supply, +12VDC, 300mA
Operating Voltage Range	+9VDC - + 24VDC
Operating Current at +12VDC	85mA (average) – 185mA (peak)
Maximum Cable Distance	150meters (500feet) (base on Belden 9538 24AWG 0.6mm, 8 core cable foilshield) (for wiegand interface) (base on Belden 9534 24AWG 06.mm, 4 core cable foilshield) (for RS485 interface)
Read Range	<=50mm (2") (Read Range is dependent on local installation conditions)
Transmit Frequency	13.56MHz
LED	Tri Color – Red, Green, Amber
LCD Display	96 x 64 Graphic LCD (AMR175)
Buzzer	Multi-tone
Operating temperature Range	-20oC to 50oC (-22oF to 150oF)
Colour	Black
Material	ABS
Weight	350 grams
Dimension	95mm (Height) X 60mm (Width) X 16mm (Thickness)
Wire Termination	10 conducting wire at length approx. 300mm
Reader Mode	Card Only, Card and PIN.
PIN Input	1 – 6 Digits (AMR175)
Keypad	3 x 4 Keys (AMR175)
Communication Interface	RS485 or Wiegand (Selectable)
Wiegand interface Output bit format	26, 32, 37, 40, 56, 80, 168(Asis) bits format and 8-digit 32, 37, 40 bits format

Support Card Type	Mifare (ISO 14443-A, ISO 14443-B)
EZ-Link	Output CAN or CSN (Selectable)
Mounting	Hook On Bracket