

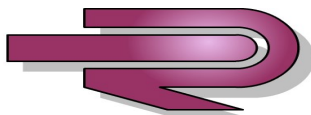
# AR-747HS-RAY Dual Band Reader

## Installation and Configuration Guide



AR-747HS-RAY

***21st February 2024***  
Version 1.1



**RAYTEL SECURITY SYSTEMS**

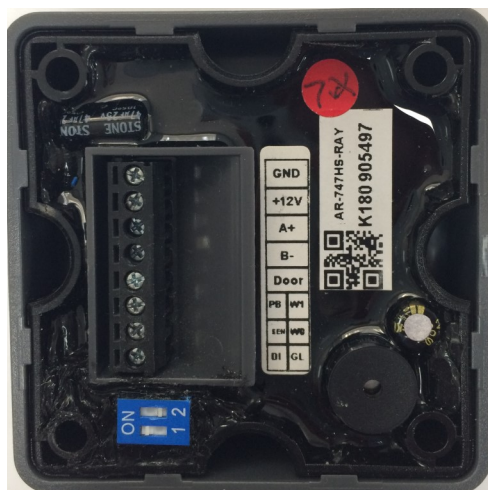
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## COMMUNICATION OPTIONS



Terminal	RS485 Functions	Wiegand Functions
GND	System 0V	System 0V
+12V	System +12V	System +12V
A+	RS485 Data +	
B-	RS485 Data -	
Door	Door Output	
PB/WG1	Push Button	Weigand WG1
SEN/WG0	Sensor	Weigand WG0
DI1/G-LED	Direct Input	Green LED

The AR-747HS-RAY Reader can communicate with controllers using either RS485 communication OR Wiegand communication dependant on the connections used as shown above.

All AR-747HS-RAY Readers have a default RS485 Node ID of 1. see page 6 for information on changing the RS485 Node ID.

Readers connected using Wiegand (WG) do not require a Node ID and will function correctly whatever RS485 Node ID is set on the reader.

Page 5 shows our recommended minimum cable requirements and connections for this reader for both types of data connection.

### Default Function of LED's and Buzzer

The below ONLY applies with Dip Switch 1 ON and Dip Switch 2 OFF. These are our recommended default settings.

**WG Mode—Buzzer Off, Red LED ON, Green LED OFF**

**RS485—Buzzer OFF, Red LED ON, Green LED OFF**

Page 7 identifies the options for buzzer and LED's which can be set via software or controllers (if the controller communicates with the readers via RS485)

# READER OVERVIEW

## The AR-747HS-RAY Reader

The AR-727E-V5 is a versatile single door proximity controller that can be used as either a stand-alone or networked device.

### Key Features:

- ☞ Dual Band 125Khz and 13.56Mhz (Mifare)
- ☞ Surface mount or flush mount in standard 40mm x 40mm cutout
- ☞ Bi-Colour LED for indication(s) of function
- ☞ Buzzer for audible indication of function
- ☞ Wiegand (WG) or RS485 communication options
- ☞ Operating voltage 9—16V DC
- ☞ Power Consumption <1.5W
- ☞ Operating temperature range -20 to +75 Degrees Centigrade
- ☞ Read range 5-8cm (125Khz and 13.56Mhz)
- ☞ RS485 Baud Rate 9600bps
- ☞ Housing material PMMA + ABS

## AR-747HS-RAY Reader DIP Switch Settings

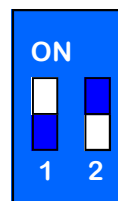
Before any AR-747HS-RAY readers are installed, it is recommended that the DIP switch settings on the back of the readers are checked.

The default DIP switch settings for the AR-747HS-RAY reader are shown below (This ensures that in WG mode the correct data (34 bit) is sent to the controller).

If the DIP switch is set differently to the example below, the switch needs to be changed, and if the readers are powered up, they need to be powered down for the changes to take effect.

SW1	SW2	OUTPUT
ON	OFF	WG34

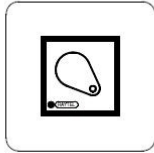
WG34



# INTERFACE CONNECTIONS

## WG Data Connection

AR-737/747HB-RAY



Cat5e/6e or CW1308

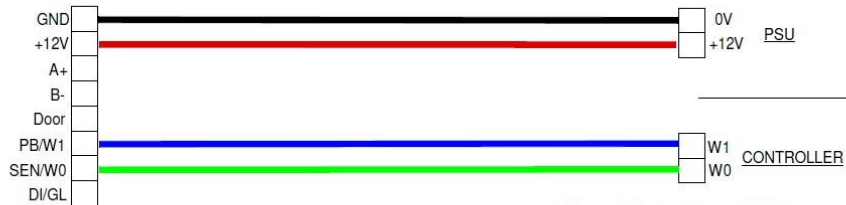


Suggested WG reader connections  
when using Cat5e/6e cable or CW1308  
Maximum distance from reader to controller 30m

AR-737/747HB-RAY



Alarm Cable

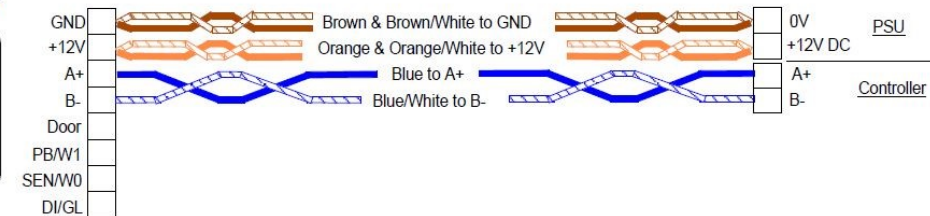
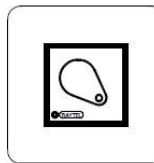


Suggested WG reader connections  
when using Alarm cable 24AWG (non twisted pairs)  
Maximum distance from reader to controller 30m

WG reader specified cable: Straight screened cable 18-22AWG, 6 + Screen (i.e. Belden 9536)  
WG connections are used for AR-727H, AR-829, AR-837, AR-888 single door controllers.

## RS485 Data Connection

AR-737HB-RAY  
AR-747HS-RAY



RS485 reader suggested connections  
when using Cat5e/6e cable or CW1308.

Power cable(s) connected as shown.

1 x twisted pair for data  
(blue cables shown)

Maximum distance from reader to controller 100m  
for 24AWG = Cat5e/6e twisted pair data conductors

Ideal RS485 Cable for Data communication: 1 x twisted pair 24AWG minimum (screened) (i.e. Belden 9502) and 1.5mm for power  
RS485 connections are used for AR-727HB-RAY, AR-716E, AR-721E series multi door controllers

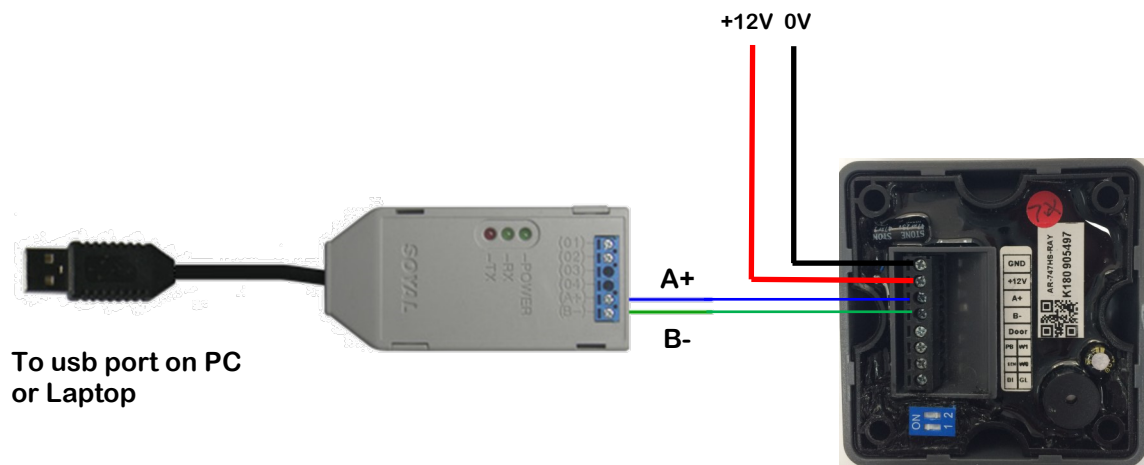
# RS485 NODE ID

When readers are connected to controllers using RS485 communication each reader requires a unique Node ID so that controllers know which reader is sending data.

The AR-716E-RAY-AJ and earlier 2 Door controllers can set reader Node ID's and Buzzer/LED functionality from the controller when it is in programming mode.

See the relevant user manual for further details.

If readers are being used in conjunction with multi-door controllers (AR-716E-16 or AR-716E-18) then readers must be configured using Node 737 software on a laptop or PC and a AR-321CM interface connected directly to the reader via a usb port. See below for reader connections. See page 7 for the use of the Node 737 software.



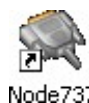
# Programme Node ID using Node737 and AR-321CM

Before connecting the readers to a multi door controller their node ID needs to be set.

Before opening Node737 quit from 701 Server if it is running.

Open Node737 software and follow the instructions below

\*Note these settings only apply for RS485 Communication\*



The screenshot shows the 'Controller parameter edit' window (Ver 2.9). The interface includes several sections: 'Stand Parameters' with radio buttons for 'Anti-pass back', 'In/Out Door', 'Is Time Attendance Door', 'On Beeper', 'On Red LED', and 'On Green LED'; a 'Door Release Time' input field; 'For HV3 Only' section with 'Force Open Alarm', 'Egress off Alarm', 'Free Zone Auto Open', 'Remote Control', 'Door-H', 'Door-L', and 'Digital Relay Output'; 'For 321/323D 6V8 and later' section with 'Open at Open Zone'; 'Reader On Message Controller' section with two channels of controller addresses; 'Communication Port' section with radio buttons for COM1 through COM12 and a TCP/IP section; and three buttons at the bottom: 'Read', 'Write', and 'Exit'. Red boxes and numbers 1 through 13 highlight specific elements: 1 points to the COM1 radio button; 2 points to the 'Read from Node' field (value 255); 3 points to the 'Read' button; 4 points to the 'Change Device Node ID to' field (value 1); 5 points to the 'No' radio button for 'Anti-pass back'; 6 points to the 'In' radio button for 'In/Out Door'; 7 points to the 'No' radio button for 'Is Time Attendance Door'; 8 points to the 'Yes' radio button for 'On Beeper'; 9 points to the 'Yes' radio button for 'On Red LED'; 10 points to the 'No' radio button for 'On Green LED'; 11 points to the 'Door Release Time' input field (value 1000); 12 points to the 'Write' button; and 13 points to the 'Exit' button.

- 1 Connect a reader via AR321CM, ensure 12V at reader, select the correct COM port.
- 2 Ensure the Node ID being read is set to 255
- 3 Click "Read"
- 4 Change Node ID to relevant number
- 5 Set Anti-Pass back to "No"
- 6 Set In/Out Door to "In"
- 7 Set Is Time Attendance Door to "No"
- 8 Set On Beeper to "Yes or No" dependant on requirement (Default OFF)
- 9 Set On Red LED to "Yes or No" dependant on requirement (Default ON)
- 10 Set On Green LED to "Yes or No" dependant on requirement (Default OFF)
- 11 Set Door Release Time if required (for local operation only)
- 12 Click Write, then repeat from step 1 until all readers are programmed
- 13 Click "Exit"

## Default LED and Buzzer Settings

DIP_SW1	DIP_SW2	Description		WG/RS485 Out-put	LED Indicators	Buzzer
ON	ON	RS485 Mode	Enable auto open zone after flashed 1st tag	Just transmit RS485 Output	<b>*with No RS485 Comms</b> RED LED flashes every Sec(Dip Sws ON ON) <b>*Stand-by:</b> No LED <b>*Valid card:</b> Red LED light-up at beginning (card present default value); and then, light-up in green after identified in valid card. <b>*Invalid card:</b> Card present in red and identified in red	<b>*Valid Card:</b> one-beep sounds <b>*Invalid Card:</b> two-beep sounds
OFF	ON		Enable auto open zone w/o flashed 1st Tag			
ON Default	OFF Default	WG Mode	WG34	Both WG and RS485 transmit output at the same time	Red LED Only unless external connection between controller and reader for Green LED	<b>*Valid Card:</b> None (Only controller has sounds because WG has no buzzer input to control) <b>*Invalid Card:</b> None (Only controller has sounds because WG has no buzzer input to control)
OFF	OFF		WG26			

Set the dip switches on the reader to the defaults shown above:

Dip switch 1 ON

Dip Switch 2 OFF

This will ensure consistent operation with RS485 or WG communication.