

# Zebra Printer RFID Troubleshooting

# **ZT411R** Printers

# **Trane Technologies**

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Prepared By: **DAVE DOOLING** Lowry Solutions 9420 Maltby Road • Brighton, MI • 48116



## **Top Problems**

- MEDIA OUT errors
- **RIBBON OUT errors**
- RFID Tags voiding excessively or 100% fail
- RFID data not encoded into chip
- Labels Skewing
- Print Image shifted too far Left/Right
- Printer settings change (USB & LAN I/F)
- SKIPPED/BLANK labels
- Print image wandering into label gaps
- LIGHT Print/POOR print quality
- RIBBON wrinkling
- Label Wrap Jam/Faulty Tear Off

				More Likely	Less Likel	
	Top 12 Problems	Operating	Calibration	Callibration REID	HOST SETUD	<sup>iitonnen, Medianor</sup>
1	MEDIA OUT errors		1&3			5
2	RIBBON OUT errors		1&3			5
3	RFID Tags voiding excessively or 100% fail		1	2&1		4&6 5
4	RFID data not encoded into chip				7	
5	Labels Skewing	3				
6	Print Image shifted too far Left/Right	3				
7	Printer settings change (USB & LAN I/F)				7	
8	SKIPPED/BLANK labels		1&3			5
9	Print image wandering into label gaps		1&3			
10	LIGHT Print/POOR print quality	3&7&5				4 5
11	RIBBON wrinkling	3				
12	Label Wrap Jam/Faulty Tear Off	3				
	x Troubleshooting Steps below					



# Tools available to End Users, Supervisors, Level 1 and Level 2 Support Technicians

Printer Support Web page via QR Code that is printed on the printer media cover and can be displayed for any error condition.

Smartphones and Mobile Computers via QR Code capture by camera or imager:

https://www.zebra.com/us/en/support-downloads/m/qr-code/zt400.html

## Desktop PC's

https://www.zebra.com/us/en/support-downloads/printers/passive-rfid/zt411.html





Individual QR Codes by error type (firmware dependent)

## **RIBBON OUT**





#### **MEDIA OUT**



#### **1** Calibration – Symptoms of faulty calibrations:

 RFID Tags voiding, Blank labels printing, False Media Out, False Ribbon Out, Print Image wandering into label gaps, LABEL LENGTH value in configuration is too short/long.

## • Resolution

 Verify the Ribbon is loaded above the metal tab as shown below in the throat of the printer on the left-hand side. If the ribbon is loaded below this metal tab, the ALERT RIBBON OUT error message will never clear. The interior *device.light.head\_open\_brightness* setting is off to get clearer picture of metal tab.





• Verify the Media Sensor is in the correct position shown below.





- Clean sensors and label/ribbon path. See video titled Media Sensor & Exterior Cleaning at Zebra website: <u>https://www.zebra.com/us/en/support-</u> <u>downloads/printers/passive-rfid/zt411.html</u>
- Perform Media Calibration: <u>https://supportcommunity.zebra.com/s/article/ZT411-ZT421-Ribbon-Media-Sensor-Manual-Calibration?language=en\_US</u>
- Perform RFID Calibration: <u>https://supportcommunity.zebra.com/s/article/ZT411-ZT421-RFID-</u> <u>Calibration?language=en\_US</u>

## 2 RFID Calibration – Symptoms of faulty RFID Calibrations

- Excessive voiding > 5% -10% range or higher than normal or 100% Void rate
- Resolution
  - Clean sensors and label/ribbon path. See video titled Media Sensor & Exterior Cleaning at Zebra website: <u>https://www.zebra.com/us/en/support-</u> <u>downloads/printers/passive-rfid/zt411.html</u>
  - Media Calibration: <u>https://supportcommunity.zebra.com/s/article/ZT411-</u> ZT421-Ribbon-Media-Sensor-Manual-Calibration?language=en\_US
  - RFID Calibration: <u>https://supportcommunity.zebra.com/s/article/ZT411-</u> ZT421-RFID-Calibration?language=en\_US
  - Inspect/compare RFID tags against known working tags in the environment and ensure the inlays look to be present, are similar in size and shape, placed in the same orientation and in the same relative position as the problem printers RFID tags. Label material should have the same part numbers affixed to them.
  - Perform an RFID Calibrate from the RFID submenu on the printer LCD menu.
     This will take ~ 6:15 for 4 X 6 labels.
  - RFID Calibrations should yield a range of values as show in the table below for the Lowry label material:



Values:

E1, E2, E3, E4 D1, D2, D3, D4 C1, C2, C3, C4



This parameter selects an antenna element from the printer's antenna array.

These values are available within the RFID Submenu on the printer LCD.

PROG POS.	ANTENNA	READ PWR	WRITE PWR
F2	A4	20	20
F2	A4	19	19
F2	A4	19	19
F2	A4	21	21
F2	A4	20	21

#### 3 Mechanical Printer Setup – Symptoms of Mechanical printer setup problems

 Light or Dark Print Quality, Ribbon wrinkling, splotches in print, Labels skewing or crunching in the label path during printing. False Ribbon Out errors.

#### • Resolution

 Verify adjustable Media Guides are adjusted correctly – not too tight and not too loose.





Verify pressure dials are set correctly. Even pressure is recommended starting point, but one dial or the other may require more or less pressure on the printhead. This adjustment is best done by pressing the feed key repeatedly and observing how the labels track through the machine. Labels should not be crunching up against the outer media guide. A good starting point is to have 3 tic marks on the yellow dial gauges facing front of printer on both dials. Lesser values will cause label slippage and wandering print image.





- Light print or Dark print can be adjusted by checking and adjusting the Darkness settings. Average Darkness value will be in the +13.0 range. The Darkness setting can be impacted by the Host settings as well so always cycle printer power before changing Darkness value.
- Ribbon wrinkling is usually caused by:

1) Adjustable media guides are too loose allowing the label and ribbon to move back and forth as labels are printing.

- 2) Darkness setting is too high.
- 3) Pressure dials are set unevenly.
- 4) Platen drive roller is worn or needs cleaning.
- 5) Ribbon supply spindle tension is not correct.



## 4 RF Environment – Symptoms of RF Interference

 Printer RFID encoding performance is good when physically positioned in certain areas of a plant and then very bad in other areas. This takes some run time to determine.

#### • Resolution

- Media Door on all RFID printers should be closed at all times unless changing out media. This will minimize any RF energy interfering with encoding the RFID tags.
- Pay close attention to any sources of RF energy in immediate vicinity of the printer that emit RF energy. Isolating the source is by process of elimination. Relocate the printer and see if the Void rate decreases. That tells us it's environment that's causing the problem.

## 5 Media & Ribbon Quality – Symptoms of media and ribbon quality issues

- Drastic change in Void rate and print quality when new roll of labels is loaded into the printer usually point to a change in the label top coating. Label thermal transfer topcoats have varying static properties which can cause RFID chips to fail excessively if the wrong one is applied. Test these labels on a known good working printer to see if the problem duplicates. If it does duplicate, there may be an issue with the lot of labels. If the problems do not move to known working printer, the issues may be in the printer mechanical setup or Darkness settings.
- Same principle above applies for ribbons. Zebra's use Coated Side Out Ink ribbons which means the ink is facing down and the ribbon unwinds in a clockwise direction off the supply spindle. Ribbon inks have static properties as well and can be the cause of premature chip failures.

The ribbon and label are a matched set. Always be wary when substituting ribbons. Sometimes Coated Side In Ink ribbons are installed by mistake which means the ink ink is facing up as it goes through the printer and the result is that the ink is burned to the printhead and nothing is printed.



The printhead usually burns through the printhead at this point as well and fouls the print head up with ink that must be cleaned off. A simple test is to use a piece of label or scotch tape and apply to the bottom face of the ribbon that touches the label and then peel it off. Ink should come off and stick to the adhesive if the correct Coated Side Out Ink ribbon is installed.

- Abnormal buildup of label adhesive in the printer label path signals that the converting facility applied too thick a coat of adhesive onto the label backing and should be reported.
- Labels fall off the backing prematurely OR the labels do not stick to the product they are applied to. This means the adhesive coating is too light – not enough has been applied.

## 6 Media Storage – Symptoms of Media Storage problems

 Label material is warped or puckered, Print Quality is splotchy at random and Printer may jam more frequently.

#### o Resolution

 Store RFID labels at proper temperatures—RFID labels should be stored at temperatures of approximately 72 degrees Fahrenheit (22 degrees Celsius) at 50% Humidity in environmentally stable conditions. Exposure to electro-static discharge (ESD), which can affect tag performance, should be limited. Lowhumidity environments may require the use of anti-static mats or clothing to help counter ESD.



## 7 Host Setup – Symptoms of Host Setup problems (in most likely order)

- Supplier PC Side: eBots Registry Change has not been accomplished. See <u>https://lowrysolutions.com/trane-comply/</u> Step 5 to download document on how to accomplish that.
- Supplier Side: eBots version is incorrect. Must be at V7.7.0. See Step 6 of <u>https://lowrysolutions.com/trane-comply/</u> which downloads the eBots Installation Guide and refer to Page 3 to download the latest eBots Application.
- Printer loses communication with USB or Networked printer during long periods of idle time requiring the printer power to be cycled to re-establish communication.
- Host generating spool files may not be sending RFID encoding commands to the printer. Perform the *ZT411R Encoding Check PDF* that is located on the Trane compliance website Step 12 to confirm the EPC Data matches https://lowrysolutions.com/trane-comply/
- Page Sizing errors are being generated at print time.
- Printer settings are changing at random and for unknown reasons causing light or dark print, changing print speeds and false Media or Ribbon Outs. Very common with USB connected printers.
- Plant Side label format is not set to "Vendor RFID Portrait". See Steps 7 thru 9 on the Trane compliance website <u>https://lowrysolutions.com/trane-comply/</u>



• Resolution for Page Sizing error or Printer settings are changing at random on USB (or

LAN) connections

• Open eBots Printer Services and confirm installed version of eBots Printer

Services is at V7.7.0.0:

🔚 eBizB	ots Laser Jet Printer Services	
File View	w Tools Help	
<b>6-1</b>	🗟 🖻	
About Pri	nter Services	×
<b>@</b>	eBizBots Printer Services Copyright © 2000-10 eBots, Inc	ОК
	Company: Lowry Solutions Additional Information: eB2PrintSvc - eBizBots Printer Serv Version: 7.7.0.0	Must be /7.7.0.0 or higher. Older versions
treaties. Unauthori result in s	this computer program is protected b. ized reproduction or distribution of thi: evere civil and criminal penalties, and ssible under the law.	

Confirm Configure Service settings are correctly configured as shown below and

pressing OK:

🙆 eBizBots Laser Jet Printer Services	
File View Tools Help	
🛏 🖹 👼 🖆	
Click on File>Configure Serv	ice
Printer Services Configuration X	
Server Settings OK	
123 Cancel	"Use Default
Using a Proxy Server HTTP Test	Printer" is not
C Select printer from printer set paralog Print Test Page	the same as
• Use Default Printer	Windows
Left Margin in Units of 1/1000 inch: 0 Top Margin in Units of 1/1000 inch: 0	"Default"
Print Copies Together	printer. This
Label Options	setting is for
# of Rows Per Page: 1	eBots only
# of Columns Per Row: 1	
Vertical Gap in units of 1/1000 inch: 0	and must be
Horizontal Gap in units of 1/1000 inch: 0	set for
Others	automatic
Show Confirmation Dialog Trace Level: None	printing.
No. of Days of Log Files to Keep: 5	printing.



 Click on File>Printer Setup and confirm the screen is as shown below and press OK:

Print Setup		? ×
Printer		
Name:	ZDesigner ZT411R-300dpi ZPL	▼ Properties
Status:	Ready	
Type:	ZDesigner ZT411R-300dpi ZPL	Default for
Where:	LAN_192.168.1.14_1	Delaution
Comment		eBots only
Set this	is printer as my default printer	
-Paper		Orientation
Size:	4X6 PINK RFID V1	Portrait
Source:	Manual feed	C Landscape
Network.		OK Cancel

 NOTE: Version 5 or Version 8 ZDesigner Drivers may be installed. Version 5 ZDesigner Driver is shown below. Version 8 ZDesigner Driver settings differ and follow V5 screenshots.



V5 Driver: Confirm the printer driver Printer Properties>Advanced> Printing
 Defaults> Stocks is set for 4X6 PINK RFID V1 for the 4 X 6 RFID Label Form and
 select "Use printer settings" for printer under the Advanced Setup tab. If 4X6
 PINK RFID V1 Stocks is not listed below proceed to Trane Compliance website
 <u>https://lowrysolutions.com/trane-comply/</u> Step 4a or 4b and download the zip
 file link contained within the USB or LAN Driver Setup document. Within the zip
 file, the Driver Setup file will be contained with instructions on how to import it.

rinter Settings	Stocks	Language	Burcode [		Barcode Font	s		Comma	nd Font	s
General S	Sharing	Ports	Advanced	Custom C	ommands	Import	Export setting	gs To	ools	About
<ul> <li>Always av</li> <li>Available</li> <li>Priority:</li> <li>Driver:</li> <li>Spool prir</li> </ul>	from 1 ZDesigne	12:00 AM T T T T T T T T T T T T T T T T T T T		S D S Paper Fon	Advanced o. Of Copies: peed: arkness: tocks: nat ) cm	6			Prin	ter Memory
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Barcode Fonts			Comman	d Fonts		🗹 Use printer settings 🛛 🚽 🔤 🔤 🖉		
Custom Commands	mport/	Export setting	s To	ols	About	Backfeed		
Options Advanced Set	qu	Dithering	Stocks	Printe	er Memory	O No backfeed O Before printing		
Use printer settings Operation Mode						Default settings     After printing		
Tear off		O A	pplicator			No Pause     O After Job		
Rewind		OS	tream			◯ After Label ◯ After Interval	0	
O Peel Off		OR	FID			Labeling Software Settings		
C Linerless Peel		00	utter			Safe graphics printing		
O Linerless Cut		Grou	up Quantity:	0		Graphic Settings		
C Linerless Delay	Cut	O A	dvanced **			Use ZIP compression		
Mirror Image			iverse			Commands		
Media Type								
Thermal Transfer	er	OT	hermal Direc	:t		Enable Passthrough Mode Start sequence:	\${	
Tracking Mode						End sequence:	}\$	
Continuous		OM	lark Sensing	1		Cancel before print		
Web Sensing						Time now mode for RTC		
Adjustment						Control characters substitution		
Тор	0.00	inch				Format & control prefixes and delimiter: Star	dard	
Tear Off	0.00	inch				Rfid Setup		_
Left Position	0.00	inch		٢.		Use printer tag type setting	4	
** Only valid for use with La	abeling	Software					Close	
Applicator		Other		Cali',	rate			

 V5 Driver: Configure the printer driver Printer Properties>Printer Settings>Override Applications Default Settings and check "Use drivers settings" for printer under the Printer Settings tab. This prevents the application from making changes to the datastream going to the printer.



General Sh	naring	Ports .	Advanced	Color I	Management	Security
rinter Settings	Stocks	Language	Barcode Fo	onts	Command Fonts	About
Use these setur detailed explana changes to take	ation. nu s	tion - please come applica	read driver doc tions must be re	cumenta estarted	tion for a for the	
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This set applicat		ines how the	printer fonts an	e prese	nted to the	
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Line Substitutio	n					
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	the driver tr emal elemer		ines and rectar	ngles in	the drawing	
Command Sepa	aration —	_	¢			
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Override Applica	ation Defau	t Settings -			_	
Alw	ays use driv	ers settings				

- V5 Driver: Duplicate this process above by right clicking on Printer Preferences this time to ensure the driver settings match up between Preferences and Properties.
   *"Preferences"* values are tied to the local Windows User that is currently logged on.
   *"Properties"* values are related to settings on a shared network printer.
- V8 Driver: Confirm the printer driver Printer Properties>Advanced> Printing
   Defaults> Page Setup> Stock Select is set for 4X6 PINK RFID V1 for the 4 X 6
   RFID Label Form. If 4X6 PINK RFID V1 Stocks is not listed below, proceed to
   Trane Compliance website <a href="https://lowrysolutions.com/trane-comply/">https://lowrysolutions.com/trane-comply/</a> Step
   4a or 4b and download the zip file link contained within the USB or LAN
   Driver Setup document. Within the zip file, the Driver Setup file will be
   contained with instructions on how to import it.



Des ZDes	igner ZT4	11R-300	dpi ZPL V8	Properties	_	
General	Sharing	Ports	Advanced	Color Management	Security	Driver Settings
Alw	vays avail	able				
⊖ Ava	ailable fro	m	12:00 AM	То	12:00	AM 🔹
Priority	y:	1	▲ ▼			
Driver:	Z	Designe	er ZT411R-30	00dpi ZPL	~	New Driver
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🖶 Z(	🖶 ZDesigner ZT411R-300dpi ZPL V8 Printing Defaults					
Printe	er Settings					
D	Page Setup	Stock Print preview				
7	Print Options	Select: 4X6 PINK RFID V1 ~				
7	Operation Mode	Media settings				
•	Graphic Options	Width:     4 "     ▲     ✓       Height:     6 "     ▲     ✓				
2	Custom Commands	Media type: N/A V				
*	Maintenance	Rotation: 0° - Portrait Mark offset: N/A				
L	Units					
i	Help and About	Inverse				



• V8 Driver: Confirm the printer driver **Printer Properties>General> Printing** 

Preferences> Page Setup> Stock Select is set the same way as shown below:

Designer ZT411R-300dp	i ZPL V8 Printing Pre	ferences	-		>
rinter Settings			-		
Page Setup	Stock			Print preview	
🗇 Print Options	Select:	4X6 PINK RFID V1	~	Print preview	
👨 Operation Mode	Media settings	-			
	Width:	4 "			
Graphic Options	Height:	6 "			
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## • Resolution for Communication problems.

- USB Printers: Disable USB selective suspend settings in Control Panel\All Control
   Panel Items\Power Options\Edit Plan Settings
- In Device Manager ALL USB Root Hubs > Properties > Power Management, setting for *"Allow the computer to turn off this device to save power"* should be unchecked.



Edit Plan Settings     ← → × ↑      P > Control Panel > All	I Control Panel Items > Power Options > Edit Plan Settings
	reention rane nems > rewel options > Earchan Settings
Power Options	? ×
	Change setting
Advanced settings	Choose the sleep a
Select the power plan that you wan and then choose settings that reflect your computer to manage power.	ect how you want
Balanced [Active]	Turn off the di
□ Turn off hard disk after	Put the comput
On battery: 10 Minutes	
Plugged in: 80 Minutes Internet Explorer	🔅 Adjust plan bri
Desktop background settings	
H Wireless Adapter Settings	
🗄 Sleep	Change advanced
<ul> <li>USB settings</li> <li>USB selective suspend setting</li> </ul>	Restore default set
On battery: Disabled	Restore default set
Plugged in: Disabled	
Intol/P) Graphics Sattings	
Restore	e plan defaults
OK Cancel	el Apply
<ul> <li>Universal Serial Bus of Generic USB Hub</li> <li>Intel(R) USB 3.0 eX</li> <li>Sentinel HASP Key</li> <li>Sentinel HL Key</li> <li>Sentinel USB Key</li> <li>USB Composite D</li> <li>USB Mass Storage</li> <li>USB Serial Convertion</li> </ul>	eXtensible Host Controller - 1.0 (Microsoft) ey / Device Device Device Device ge Device









## • Resolution for Network IP Communication problems

On printers web page, go to Network Configuration>TCP/IP settings and set IP Protocol = PERMANENT and set the ARP Broadcast Interval to 3 minutes. Then click Submit and then click on View and Modify Printer Settings, scroll to bottom and select Save Current Configuration and then repeat and select Reset Network for changes to take effect.



Submit Changes



# **View and Modify Printer Settings**

<u>General Setup</u> <u>Serial Communications Setup</u> <u>Network Configuration</u> <u>RFID Setup</u> <u>Print Listings on Label</u> <u>Media Setup</u> <u>Calibration</u> <u>ZPL Control</u> <u>Advanced Setup</u>

Save Current Configuration

Restore Saved Configuration

Restore Default Configuration

Restore Default Network Configuration

**Reset Network** 

Author: Dave Dooling

Lowry Solutions, Inc.

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