

Zebra Printer RFID Troubleshooting

ZT411R Printers

Trane Technologies

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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 Like	ly 🛛	
	Top 1	2 Probl	lems				Operator Setup	Calibration	Calibration Rfills	HOST SETUD	Vironment	Ribbon or
1	MEDIA C	OUT errors						1&3				5
2	RIBBON	OUT error	s					1&3				5
3	RFID Tag	s voiding e	excessively	y or 100%	fail			1	2&1		4&6	5
4	RFID dat	a not enco	oded into	chip						7		
5	Labels Sl	cewing					3					
6	Print Ima	age shifted	l too far L	eft/Right			3					
7	Printer s	ettings cha	ange (USB	& LAN I/	′F)					7		
8	SKIPPED	/BLANK la	bels					1&3				5
9	Print ima	age wande	ering into	label gaps	5			1&3				
10	LIGHT Pr	int/POOR	print qua	lity			3&7&5				4	5
11	RIBBON	wrinkling					3					
12	Label W	rap Jam/Fa	aulty Tear	Off			3					
	7					7						
	x	Troubles	hooting St	eps belov	N							



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:

🔄 eBizBots Laser Jet Printer Services									
File View Tools Help									
🛌 🖹 📸 😭									
About Printer Services	×								
eBizBots Printer Services Copyright © 2000-10 eBots, In	с								
This product is licensed to : Name: Lowry Solutions Company: Lowry Solutions 	Must be V7.7.0.0 or higher. Older versions								
Warning: this computer program is protect treaties. Unauthorized reproduction or distribution result in severe civil and criminal penalties extent possible under the law.	red b. Will not of thi: s, and Work								

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 Ontions	Printer" is not								
C Select printer from printer set , dialog Print Test Page	the same as								
(• Use Default Printer	Windows								
Too 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	cools only								
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	Dofault 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	ts		Comma	nd Fonts	3
General S	Sharing	Ports	Advanced	Custom C	ommands	Import/	Export setting	gs To	ools	About
 Always av Available Priority: Driver: Spool prir Start p 	railable from 1 ZDesigne nt documer printing aft	12:00 AM T r ZT411R-30 nts so progr er last page	00dpi ZPL am finishes p is spooled	Options ettings - N S D S Paper Fon	Advanced	Setup 6 1 4	Dithering 0 X6 PINK RFI	Stocks "7s D V1 ortrait ndscape	Print	er Memory
Start printing immediately Print directly to the printer Hold mismatched documents				Size — V) inch Vidth: leight:	4.09		tate 180°		
🗹 🖬 rint spoo	led docum	nents first		Unprintabl	le Area —					
Ke p prin	ted docum	ients		L	eft:	0.00	Тор		0.00	
Enal le advanced printing features Printing Defaults Print Processor			R	light:	0.00	Botte	om:	0.00		



Barcode Fonts Command Fonts						🗹 Use printer settings 🛛 🚽 🔤 🔤 🖉		
Custom Commands	mport/l	Export setting	s Too	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 Pause		
Tear off		O A	pplicator			No Pause O After Job		
Rewind		OS	tream			After Label O After Interval	0	
O Peel Off		OR	FID			Labeling Software Settings		_
C Linerless Peel		00	utter			Safe graphics printing		
C Linerless Cut Grou			ip Quantity:	0		Graphic Settings		
C Linerless Delay Cut					Use 7IP compression			
Mirror Image				Commande				
Media Type							at.	
Thermal Transfer	er	OT	hermal Direc	t		Enable Passthrough Mode Start sequence:	\${	
Tracking Mode						End sequence:	}\$	
Continuous		OM	ark Sensing			Cancel before print		
Web Sensing						Time now mode for RTC		
Adjustment						Control characters substitution		
Тор	0.00	inch				Format & control prefixes and delimiter: Standa	rd	
Tear Off	0.00	inch				Rfid Setup		2
Left Position	0.00	inch		r		Use printer tag type setting		2
** Only valid for use with La	beling	Software				c	lose	
Applicator		Other		Cali	ate			

 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 Sł	naring	Ports /	Advanced C	Color Management	Security
rinter Settings	Stocks	Language	Barcode For	ts Command Font	s About
Use these setur detailed explana changes to take	is with cau ation. As s e effect.	tion - please come applicat	read driver docur ions must be rest	mentation for a arted for the	
Printer Fonts -					
Print	ter default		O Vector fonts	3	
⊖ Ras	ter fonts		Merged cha	aracters	
This se applica	tting determi tions.	ines how the	printer fonts are	presented to the	
Spool Format					
Print Rav A spool	ter default v format of th	e print job is	O Enhanced r	netafile	
Line Substitutio	n —				
Prin Ena	ter default bled		O Disabled		
Should with inte	the driver tr emal elemer	y to replace li nts?	nes and rectang	les in the drawing	
Command Sep	aration —	-	¢		
O Prin	ter default		Number of a	zeros: 0	
Some p as a nu	orinters requir imber harwe	e a pause b en 1 and 204	etween comman 18:	ds. Define it here	/
Override Applic	ation Defaul	t Settings —			
Alw 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 https://lowrysolutions.com/trane-comply/ 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	O Available from 12:00 AM To 12:00 AM €									
Priority: 1										
Driver:	Driver: ZDesigner ZT411R-300dpi ZPL V New Driver									
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🖶 ZDesigner ZT411R-300dpi ZPL V8 Printing Defaults X										
Printe	Printer Settings									
D	Page Setup	Stock Print preview								
7	Print Options	Select: 4X6 PINK RFID V1 ~								
7	Operation Mode	Media settings								
•	Graphic Options	Width: 4" 🗘 🗹								
2	Custom Commands	Media type: N/A								
*	Maintenance	Rotation: 0° - Portrait								
L	Units									
i	Help and About									



• 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 province	
🗇 Print Options	Select:	4X6 PINK RFID V1	~	Frint preview	
🖶 Operation Mode	Media settings	-			
	Width:	4 "			
Graphic Options	Height:	6 "			
Custom Commands	Media type:	N/A	~ 💌	400	
Mr. M. C.	Rotation:	0° - Portrait	~	min 2.3	
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L Units	🔲 Mirror labe			·····	
i Help and About	Inverse			 Decidentity deviation and a solution of 	

\circ $\;$ 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	> All Control Panel Items > Power Ontions > Edit Plan Settings
	All control Parler items > Power Options > Edit Plan Settings
Power Options	? ×
	Change setting
Advanced settings	Choose the sleep ar
Select the power plan that yo and then choose settings that your computer to manage po	u want to customize, reflect how you want ower.
Balanced [Active]	V Turn off the dis
Turn off hard disk after	Put the comput
On battery: 10 Minutes	
Internet Explorer	🔅 Adjust plan brig
Desktop background settings	
Wireless Adapter Settings	
	Change advanced p
USB settings	Restore default sett
On battery: Disabled	
Plugged in: Disabled	
Intol/D) Graphics Cattings	
Re	estore plan defaults
ОК	Cancel Apply
 Universal Serial Generic USE Intel(R) USB Sentinel HA 	Bus controllers 3 Hub 3.0 eXtensible Host Controller - 1.0 (Microsoft) SP Key
🏺 Sentinel HL	Key
Sentinel US	B Key
USB Compo	
USB Compo	pite Device
USB Compo	osite Device
🖣 USB Mass S	torage Device
🏺 USB Root H	ub (USB 3.0)
🛡 USB Serial C	Converter









• 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

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