Zebra Printer RFID Troubleshooting

ZT411R Printers

Trane Technologies

NOVEMBER 9, 2020

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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*

	Top 12 Problems	Mechanical Operator Setup	Calibration	Calibration RFID	Host Setup	Environment	Ribbon or Media
				More Likely	Less Likely		
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

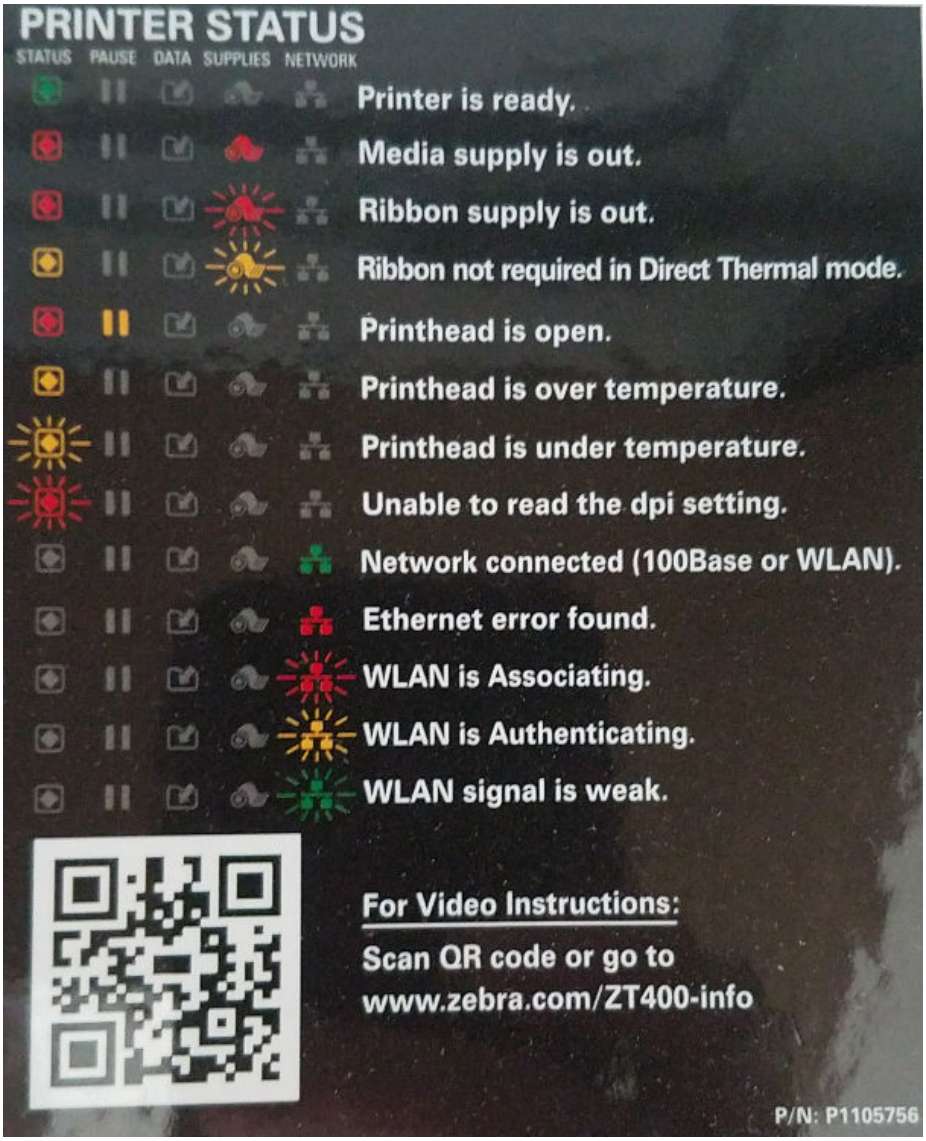
Printer Support Web page via QR Code that is printed on the printer media cover and can be displayed for any error condition.

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

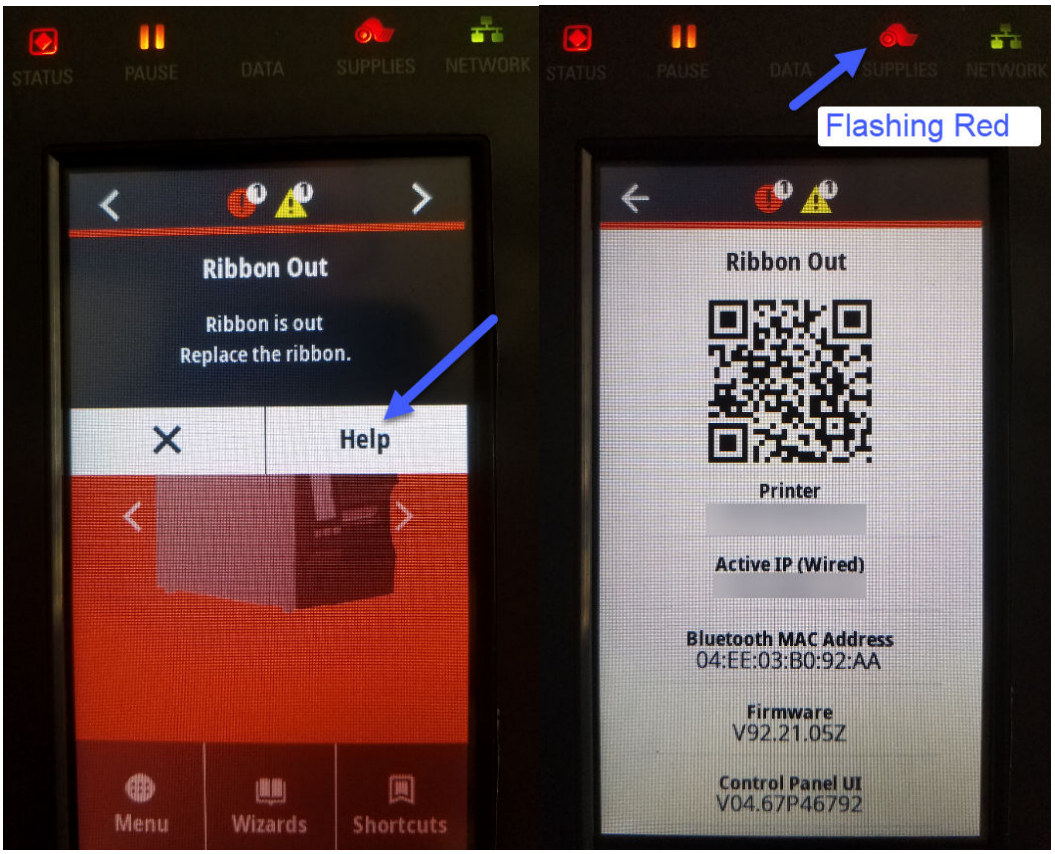
Desktop PC's

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

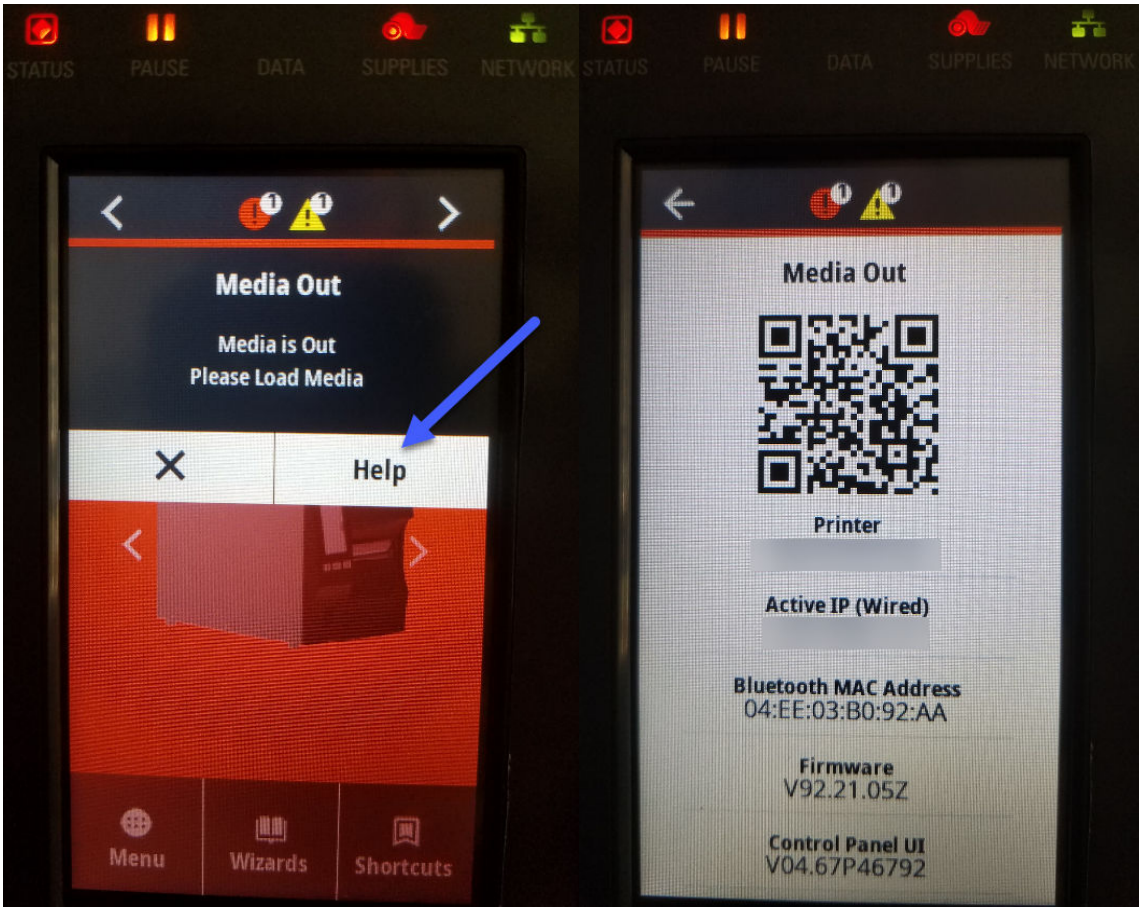


Individual QR Codes by error type (firmware dependent)

RIBBON OUT



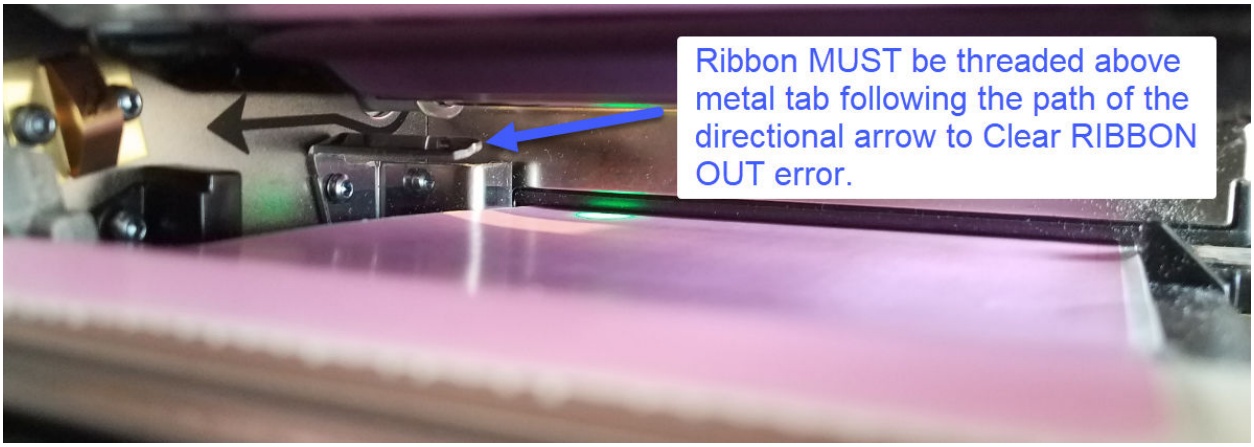
MEDIA OUT



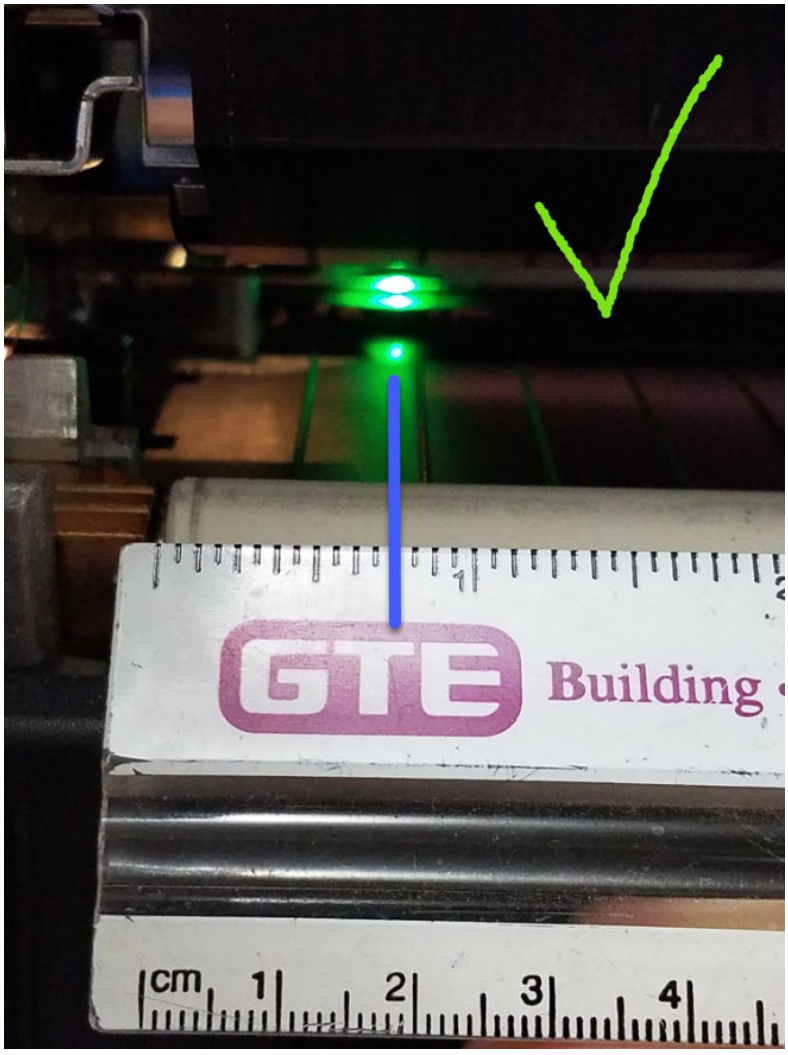
1 **Calibration – Symptoms of faulty calibrations:**

- 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: https://www.zebra.com/us/en/support-downloads/printers/passive-rfid/zt411.html
- Perform Media Calibration: **https://supportcommunity.zebra.com/s/article/ZT411-ZT421-Ribbon-Media-Sensor-Manual-Calibration?language=en_US**
- Perform RFID Calibration: **https://supportcommunity.zebra.com/s/article/ZT411-ZT421-RFID-Calibration?language=en_US**

2 RFID Calibration – Symptoms of faulty RFID Calibrations

- Excessive voiding > 5% -10% range or higher than normal or 100% Void rate

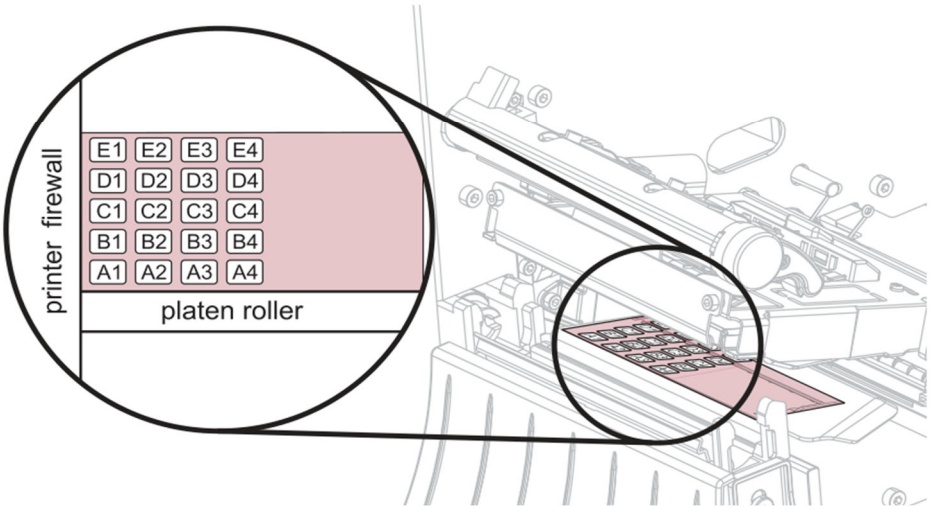
○ Resolution

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

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

Values:

E1, E2, E3, E4
D1, D2, D3, D4
C1, C2, C3, C4
B1, B2, B3, B4
A1, A2, A3, A4



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

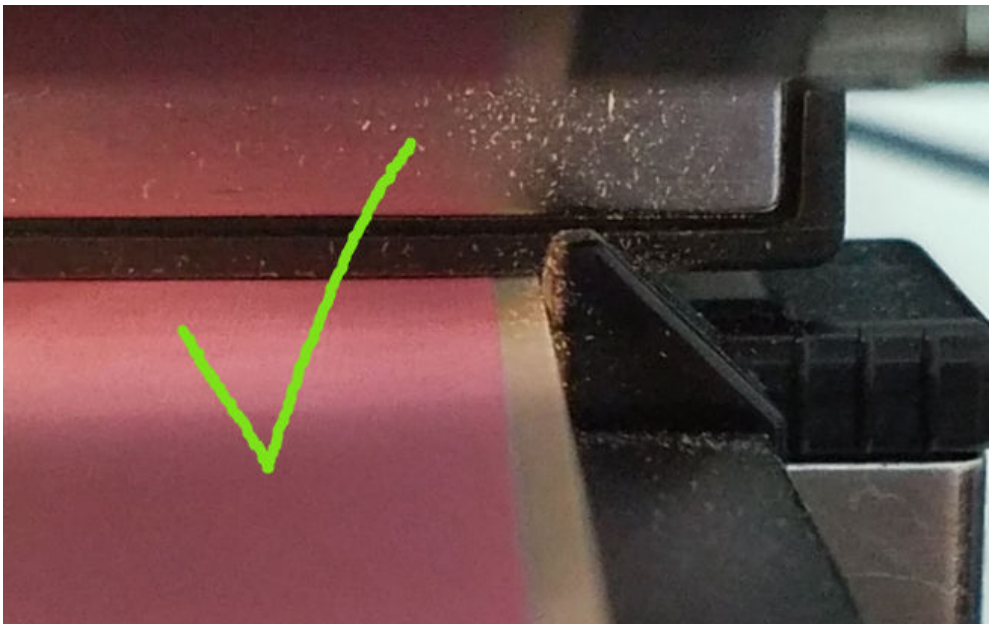
PROG POS.	ANTENNA	READ PWR	WRITE PWR
F2	A4	20	20
F2	A4	19	19
F2	A4	19	19
F2	A4	21	21
F2	A4	20	21

3 Mechanical Printer Setup – Symptoms of Mechanical printer setup problems

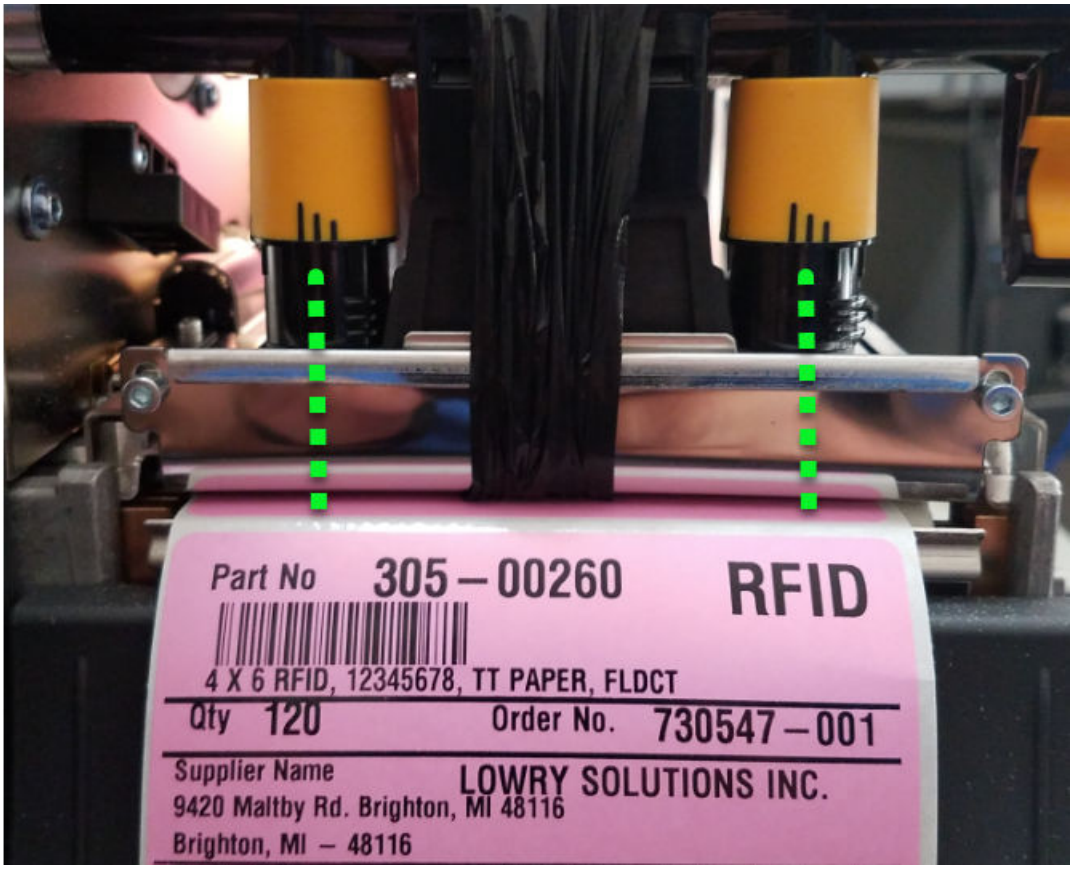
- Light or Dark Print Quality, Ribbon wrinkling, splotches in print, Labels skewing or crunching in the label path during printing. False Ribbon Out errors.

o 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.

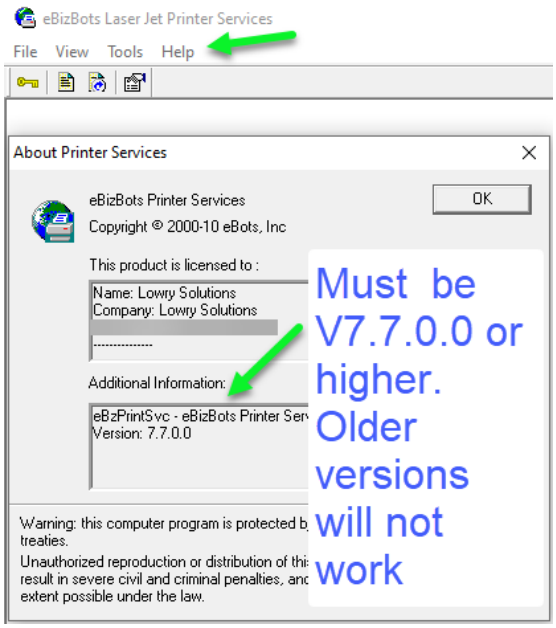
Resolution

- 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. Low-humidity environments may require the use of anti-static mats or clothing to help counter ESD.

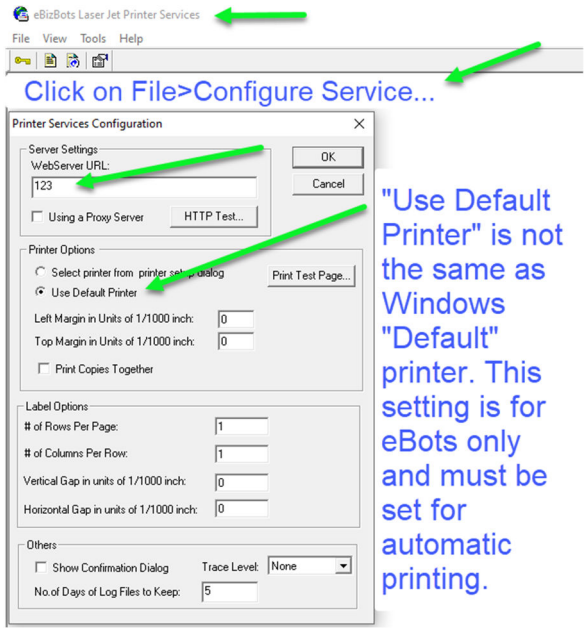
7 Host Setup – Symptoms of Host Setup problems (in most likely order)

- Supplier PC Side: eBots Registry Change has not been accomplished. See https://lowrysolutions.com/trane-comply/ 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 https://lowrysolutions.com/trane-comply/ 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 https://lowrysolutions.com/trane-comply/

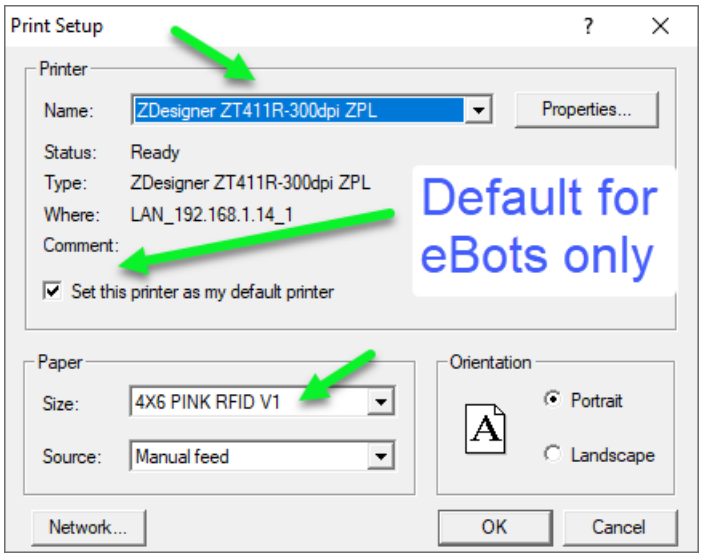
- **Resolution for Page Sizing error or Printer settings are changing at random on USB (or LAN) connections**
  - Open eBots Printer Services and confirm installed version of eBots Printer Services is at V7.7.0.0:



  - Confirm **Configure Service** settings are correctly configured as shown below and pressing OK:

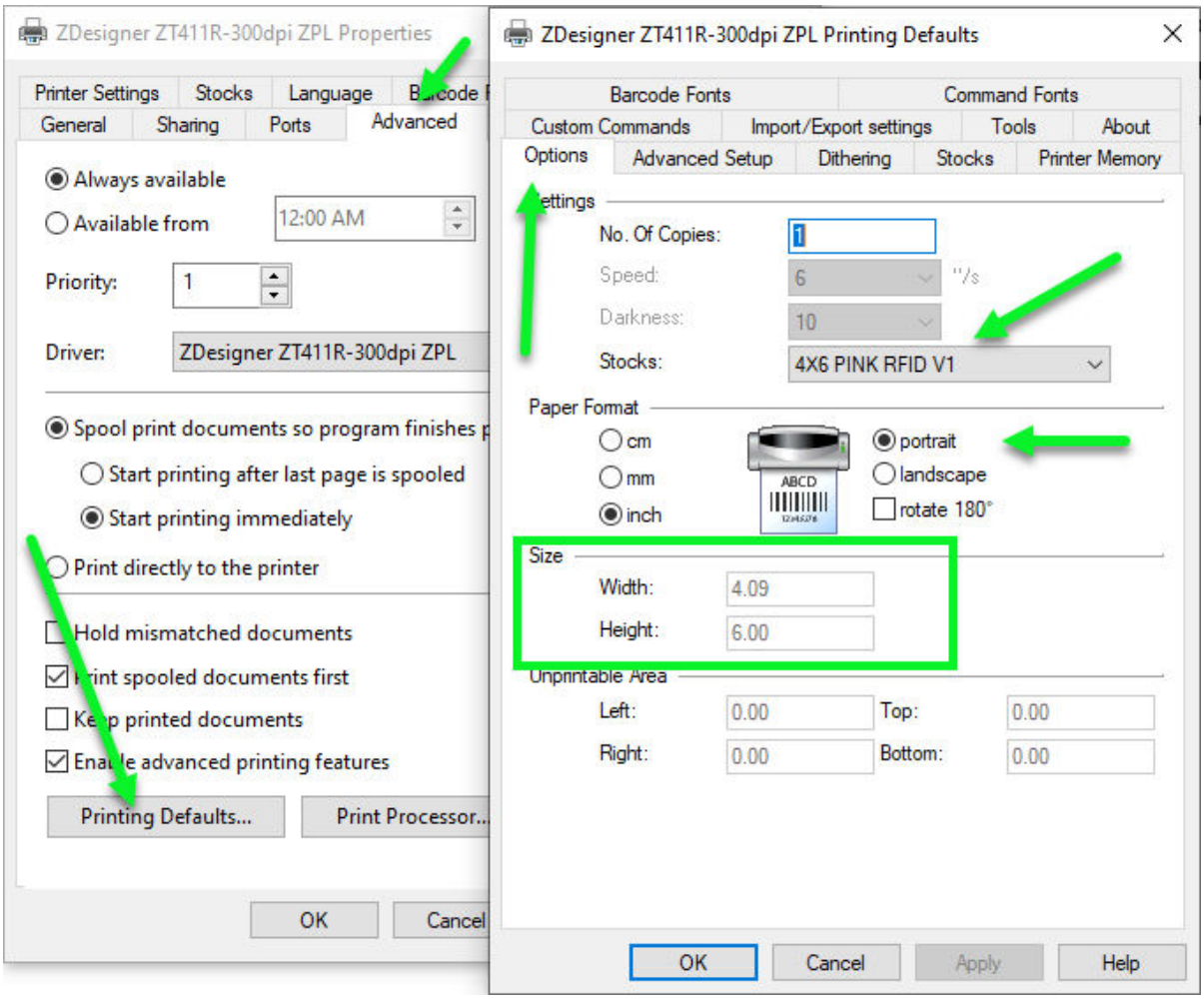


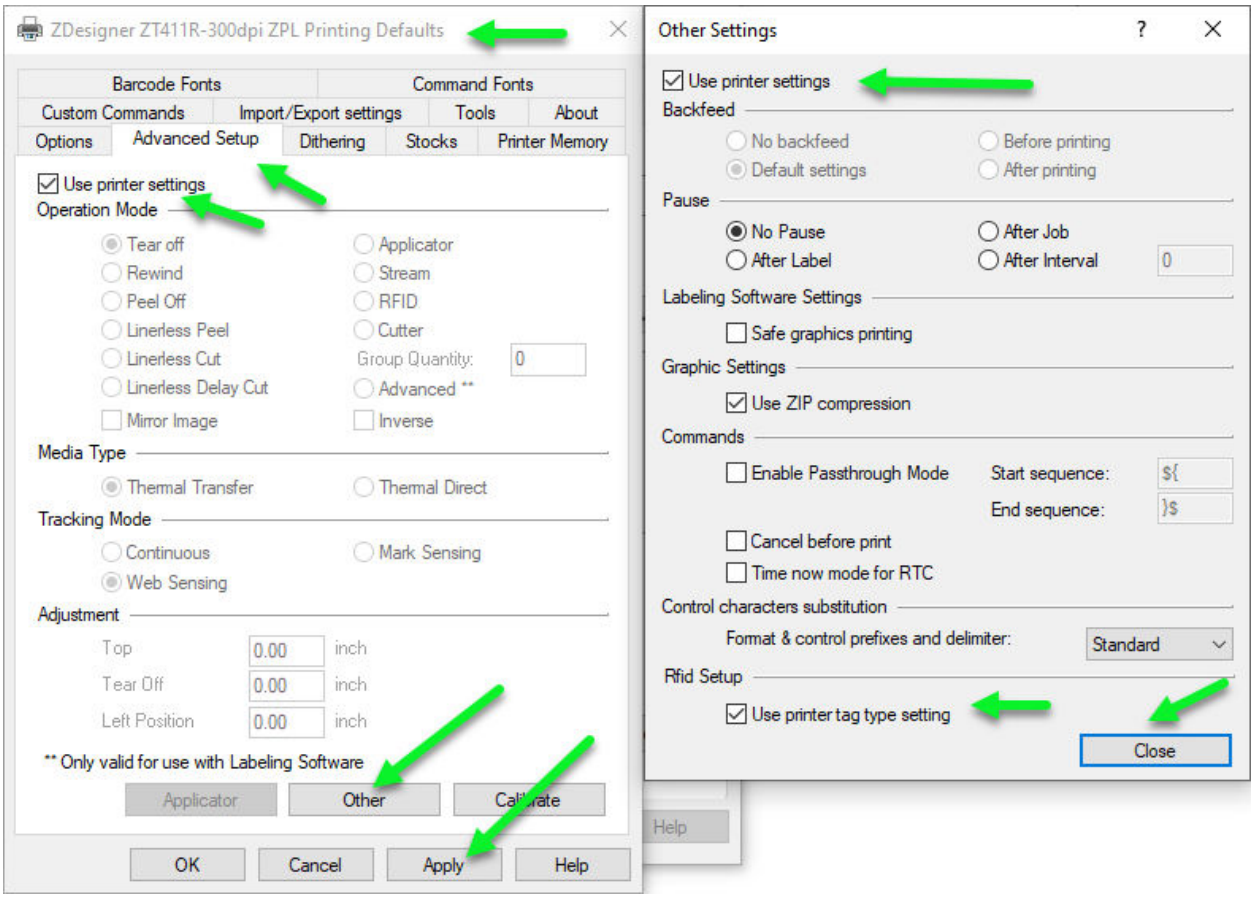
- Click on File>Printer Setup and confirm the screen is as shown below and press OK:



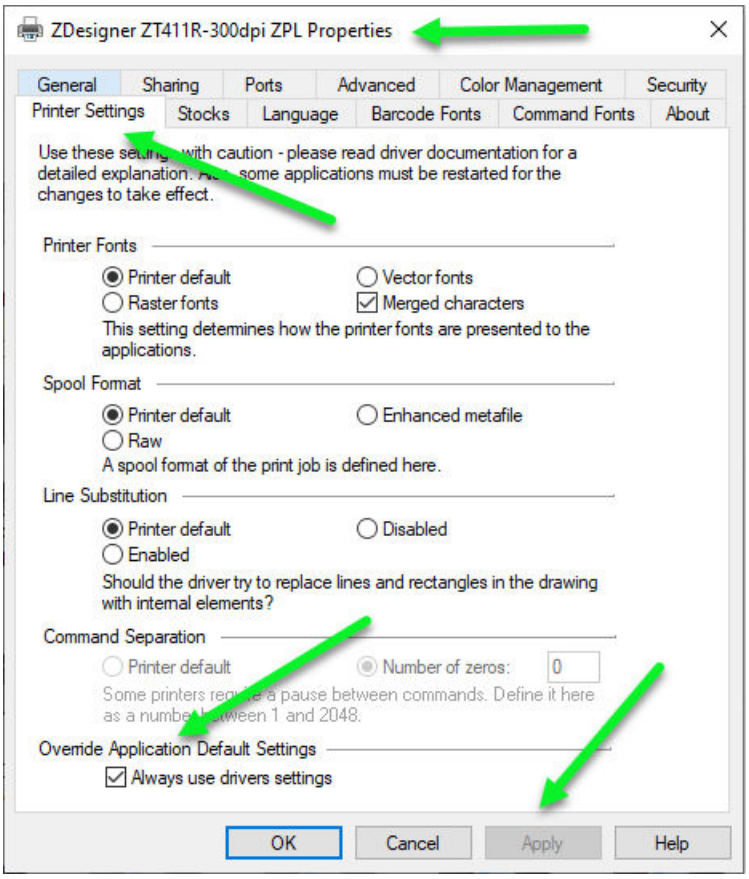
- **NOTE:** *Version 5 or Version 8 ZDesigner Drivers may be installed. Version 5 ZDesigner Driver is shown below. Version 8 ZDesigner Driver settings differ and follow V5 screenshots.*

- 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 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.

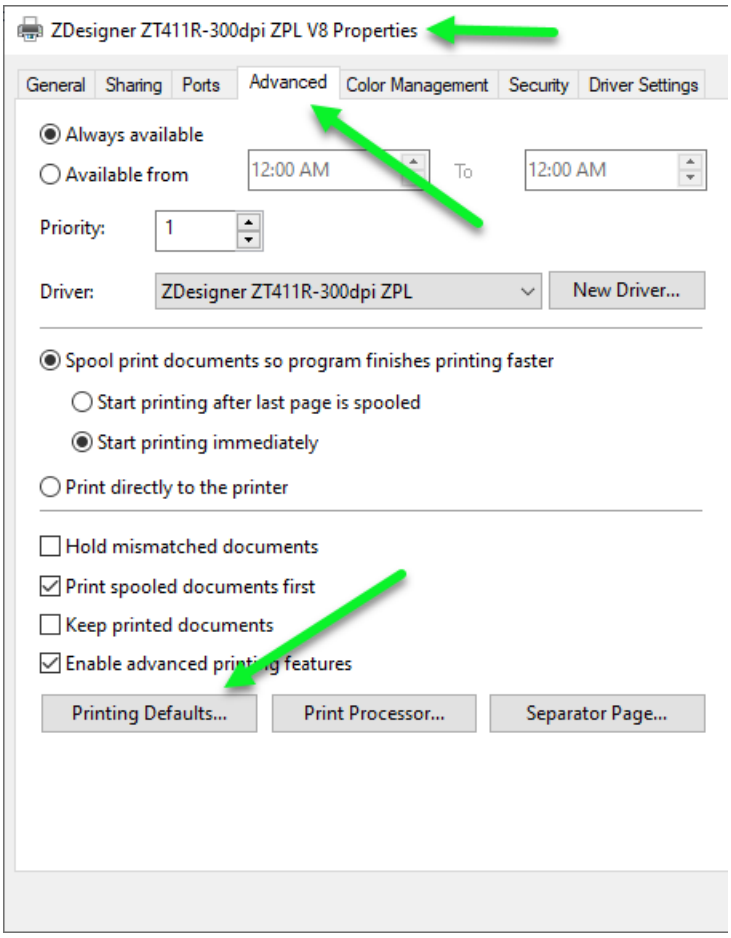


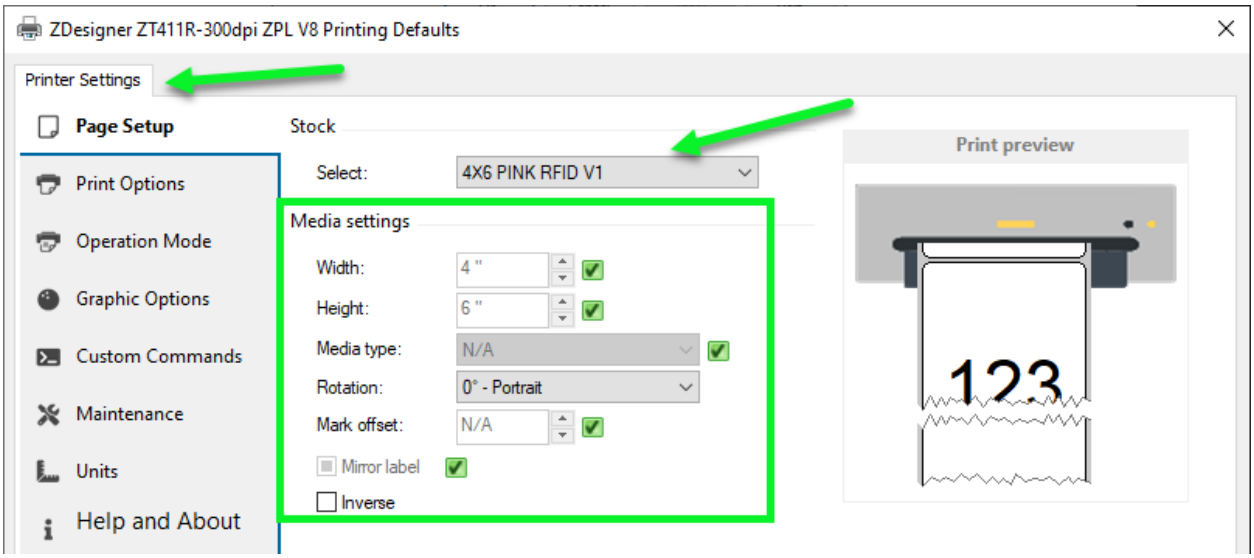


- V5 Driver: Configure the printer driver **Printer Properties>Printer Settings>Override Applications Default Settings** and check *"Use drivers settings"* for printer under the Printer Settings tab. This prevents the application from making changes to the datastream going to the printer.

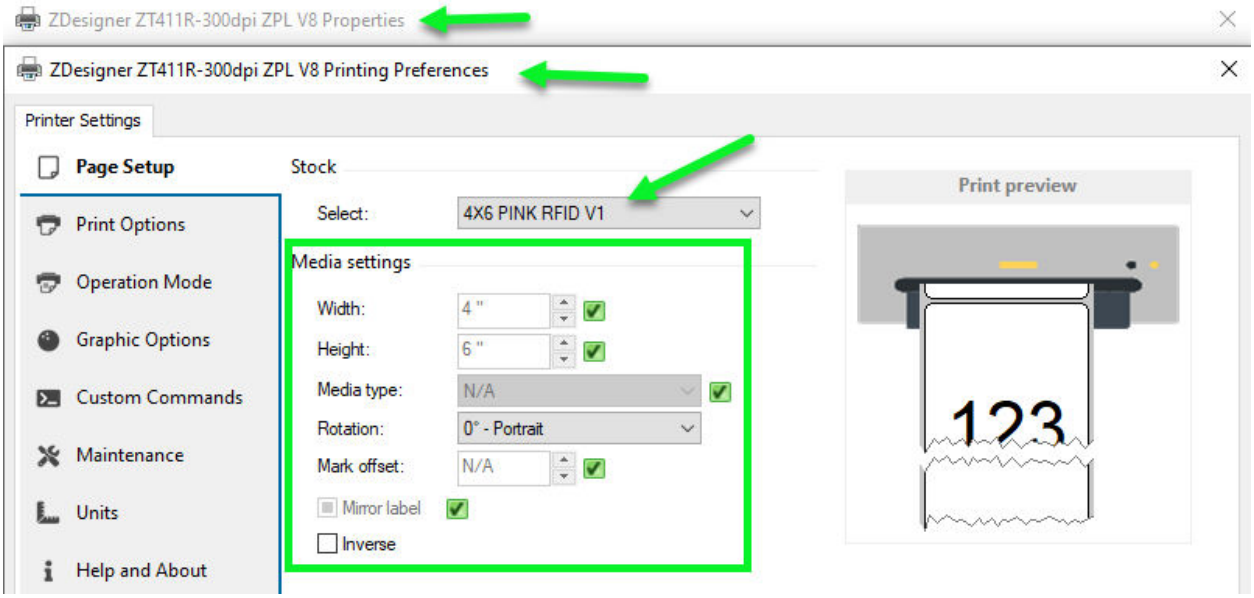


- V5 Driver: Duplicate this process above by right clicking on **Printer Preferences** this time to ensure the driver settings match up between **Preferences** and **Properties**. ***"Preferences"*** values are tied to the local Windows User that is currently logged on. "***Properties"*** values are 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.

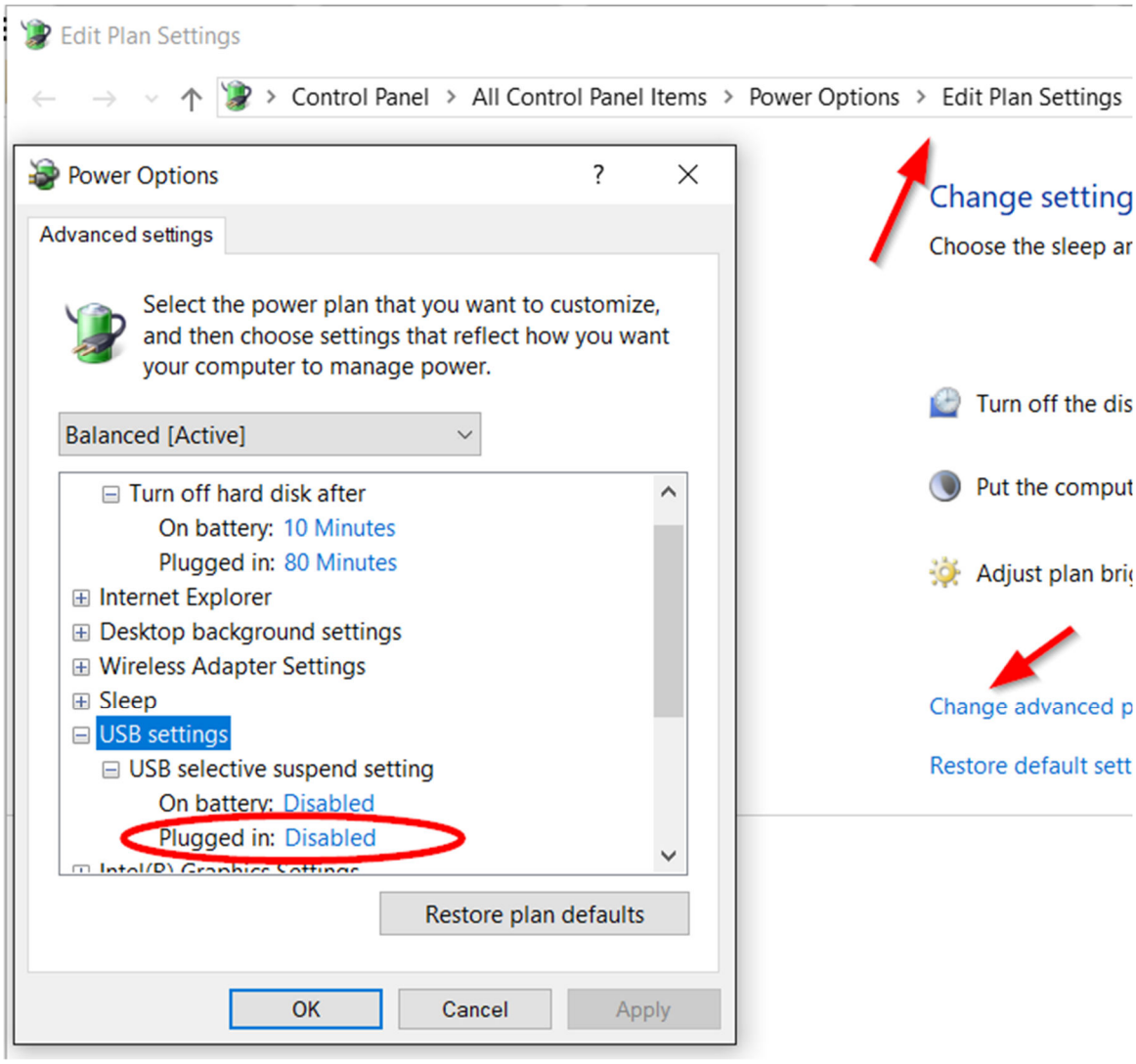

ZDesigner ZT411R-300dpi ZPL V8 Properties
General
Sharing
Ports
Advanced
Color Management
Security
Driver Settings
Always available
Available from
12:00 AM
To
12:00 AM
Priority:
1
Driver:
ZDesigner ZT411R-300dpi ZPL
New Driver...
Spool print documents so program finishes printing faster
Start printing after last page is spooled
Start printing immediately
Print directly to the printer
Hold mismatched documents
Print spooled documents first
Keep printed documents
Enable advanced printing features
Printing Defaults...
Print Processor...
Separator Page...

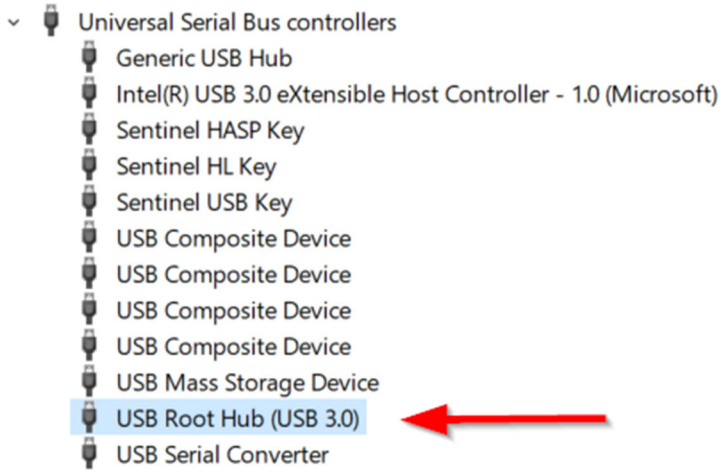

ZDesigner ZT411R-300dpi ZPL V8 Printing Defaults
Printer Settings
Page Setup
Print Options
Operation Mode
Graphic Options
Custom Commands
Maintenance
Units
Help and About
Stock
Select:
4X6 PINK RFID V1
Media settings
Width:
4 "
Height:
6 "
Media type:
N/A
Rotation:
0° - Portrait
Mark offset:
N/A
Mirror label
Inverse
Print preview
123

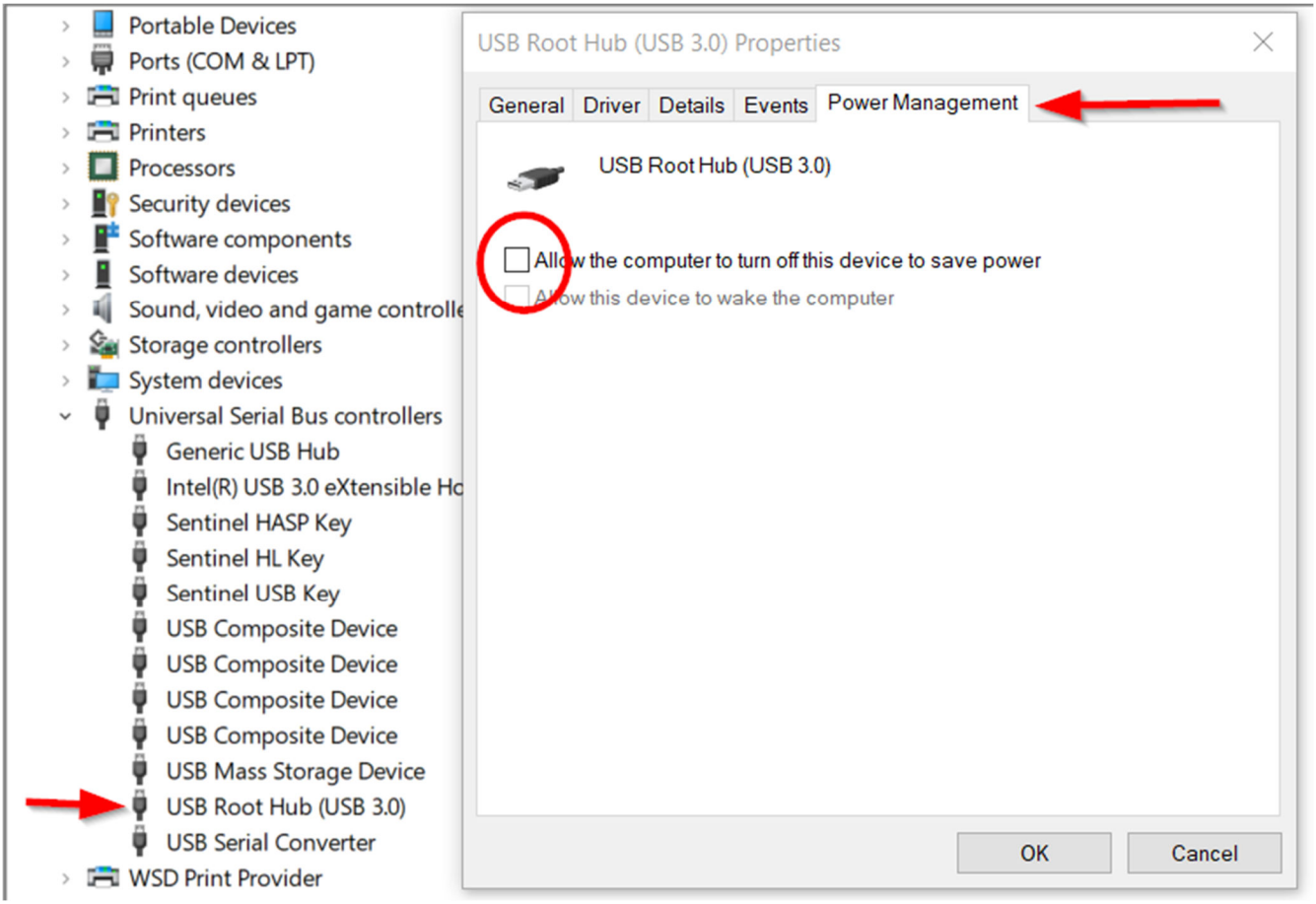
- V8 Driver: Confirm the printer driver **Printer Properties>General> Printing Preferences> Page Setup> Stock Select** is set the same way as shown below:



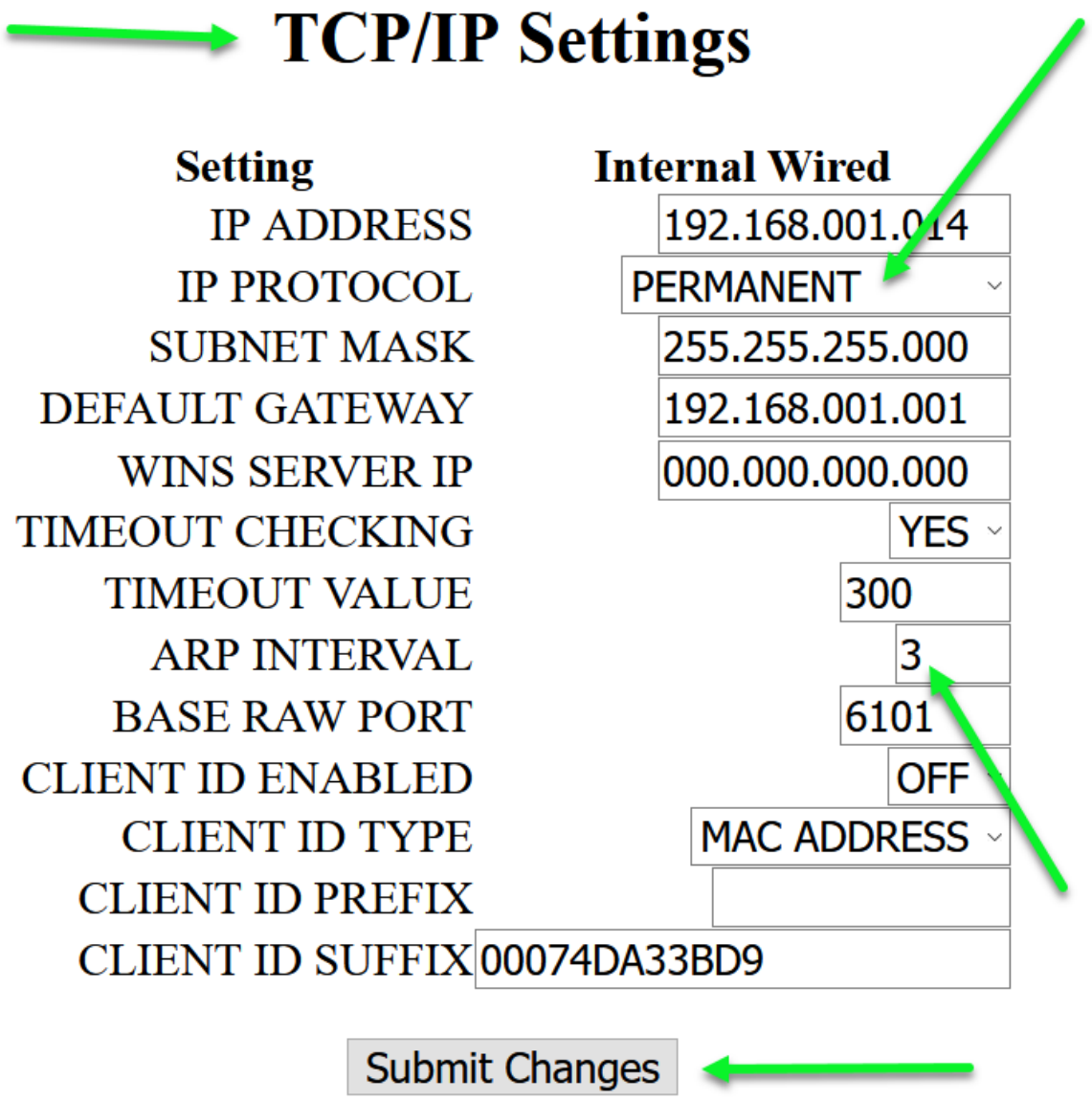
- **Resolution for Communication problems.**
  - USB Printers: Disable USB selective suspend settings in Control Panel\All Control Panel Items\Power Options\Edit Plan Settings
  - In Device Manager – ALL USB Root Hubs > Properties > Power Management, setting for *"Allow the computer to turn off this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


Edit Plan Settings
Control Panel > All Control Panel Items > Power Options > Edit Plan Settings
Power Options
Advanced settings
Select the power plan that you want to customize, and then choose settings that reflect how you want your computer to manage power.
Balanced [Active]
Turn off hard disk after
On battery: 10 Minutes
Plugged in: 80 Minutes
Internet Explorer
Desktop background settings
Wireless Adapter Settings
Sleep
USB settings
USB selective suspend setting
On battery: Disabled
Plugged in: Disabled
Restore plan defaults
OK
Cancel
Apply
Change setting
Choose the sleep ar
Turn off the dis
Put the comput
Adjust plan bri
Change advanced p
Restore default sett


Universal Serial Bus controllers
Generic USB Hub
Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
Sentinel HASP Key
Sentinel HL Key
Sentinel USB Key
USB Composite Device
USB Composite Device
USB Composite Device
USB Composite Device
USB Mass Storage Device
USB Root Hub (USB 3.0)
USB Serial Converter


Portable Devices
Ports (COM & LPT)
Print queues
Printers
Processors
Security devices
Software components
Software devices
Sound, video and game controlle
Storage controllers
System devices
Universal Serial Bus controllers
Generic USB Hub
Intel(R) USB 3.0 eXtensible Ho
Sentinel HASP Key
Sentinel HL Key
Sentinel USB Key
USB Composite Device
USB Composite Device
USB Composite Device
USB Composite Device
USB Mass Storage Device
USB Root Hub (USB 3.0)
USB Serial Converter
WSD Print Provider
USB Root Hub (USB 3.0) Properties
General
Driver
Details
Events
Power Management
USB Root Hub (USB 3.0)
Allow the computer to turn off this device to save power
Allow this device to wake the computer
OK
Cancel

- **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.



View and Modify Printer Settings

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

Save Current Configuration

Restore Saved Configuration

Restore Default Configuration

Restore Default Network Configuration

Reset Network

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Lowry Solutions, Inc.

11/9/2020