



Zebra Printer RFID Troubleshooting

ZT410R Printers

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Top Problems

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

		More Likely ←				Less Likely →		
		Mechanical Operator Setup	Calibration	Calibration	RFID	Host-Setup	Environment	Ribbon or Media
Top 12 Problems								
1	RFID data not encoded into chip					7		
2	Print Image shifted too far Left/Right	3						
3	Label Wrap Jam/Faulty Tear Off	3						
4	RFID Tags voiding excessively or 100% fail		1	2 & 1			4 & 6	5
5	SKIPPED labels		1					5
6	MEDIA OUT errors		1					5
7	RIBBON OUT errors		1					5
8	Print image wandering into label gaps		1					5
9	LIGHT Print/POOR print quality	3 & 7 & 5					4	5
10	RIBBON wrinkling	3						
11	Labels Skewing	3						
12	Printer settings change (Windows USB Driver)					7 & 8		
	x Troubleshooting Steps below							

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

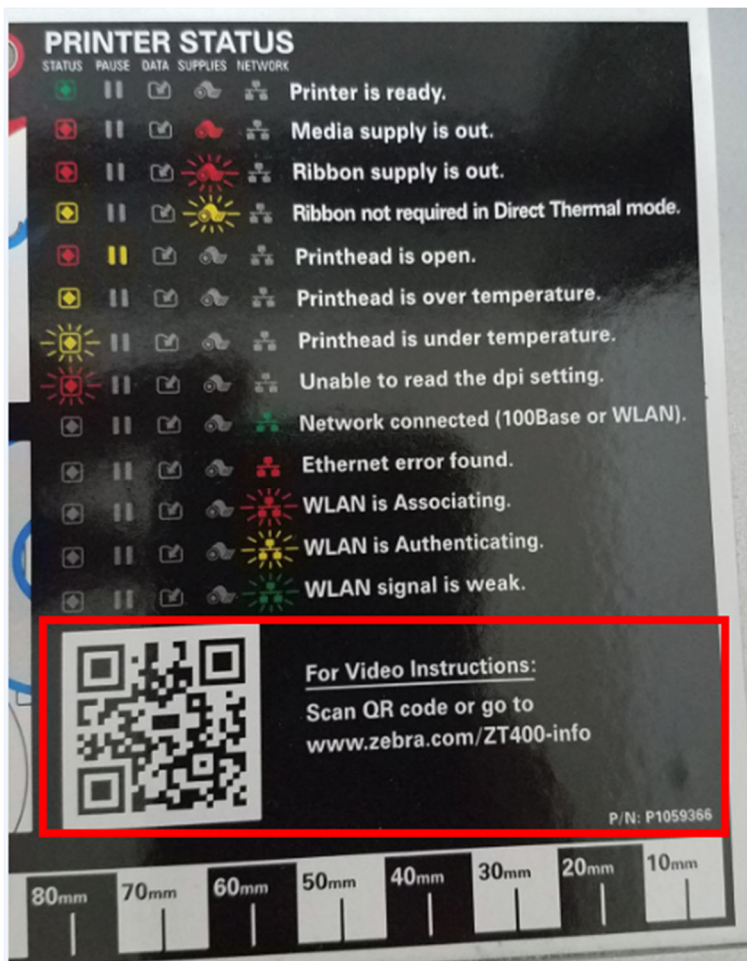
Printer Support Web page via QR Code that is printed on the printer media cover and can be displayed for any error condition.

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/m/qr-code/zt400.html>

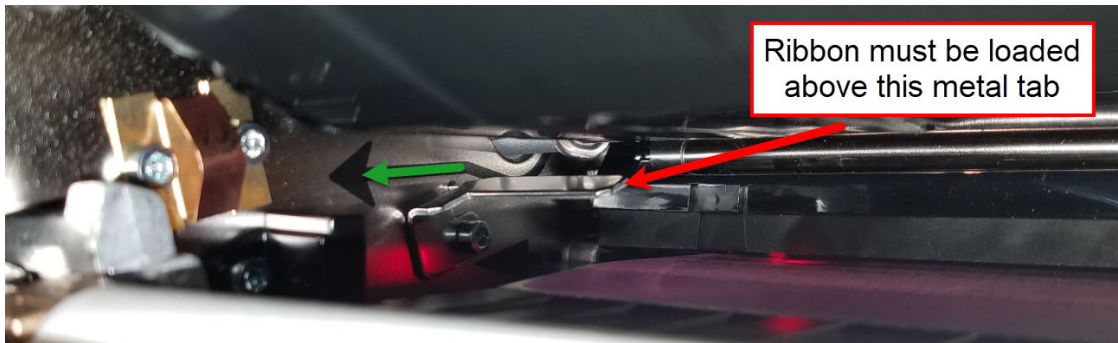


Individual QR Codes by error type (firmware dependent)

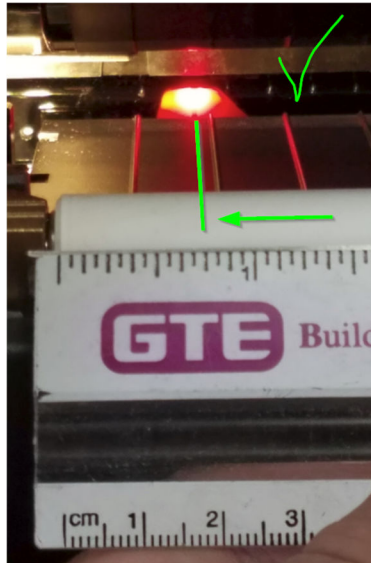


1 Calibration – Symptoms of faulty calibrations:

- 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.



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



- Clean sensors and label/ribbon path and perform a MEDIA/RIBBON Calibrate and then an RFID Calibrate to reset the printer's media sensors, calculated label length and RFID Encoding values.
- <https://www.zebra.com/content/dam/zebra/videos/en-us/industrial/zt400/how-to/manual-calibration-zt400-en.mp4>
- <https://lowrysolutions.com/ir-comply/> Step 2 c. IR ZT410 RFID Setup Video @ 2:10 mark.

2 RFID Calibration – Symptoms of faulty RFID Calibrations

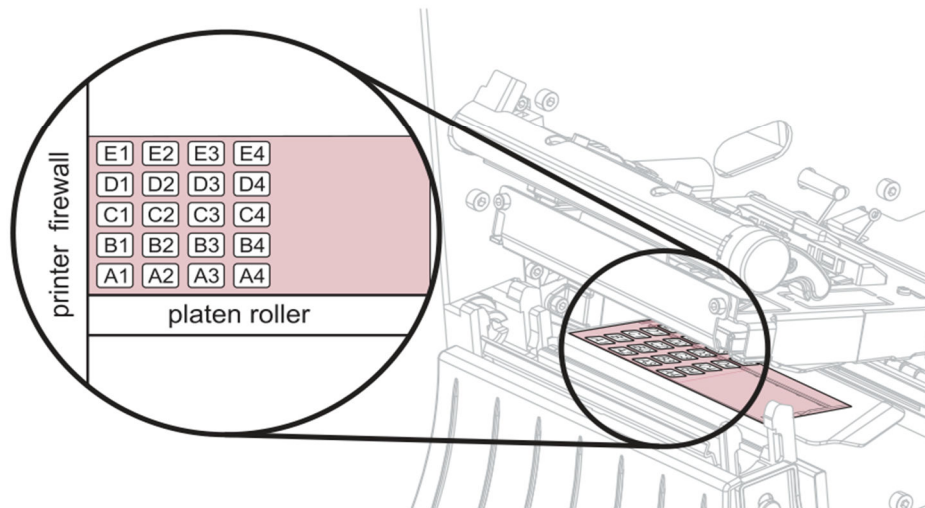
- Excessive voiding > 5% -10% range or higher than normal or 100% Void rate
- **Resolution**
 - Clean sensors and label/ribbon path and perform a MEDIA/RIBBON Calibrate and then an RFID Calibrate to reset the printer's media sensors, calculated label length and RFID Encoding values.
 - <https://www.zebra.com/content/dam/zebra/videos/en-us/industrial/zt400/how-to/manual-calibration-zt400-en.mp4>
 - <https://lowrysolutions.com/ir-comply/> Step 2 c. IR ZT410 RFID Setup Video @ 2:10 mark.

- 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



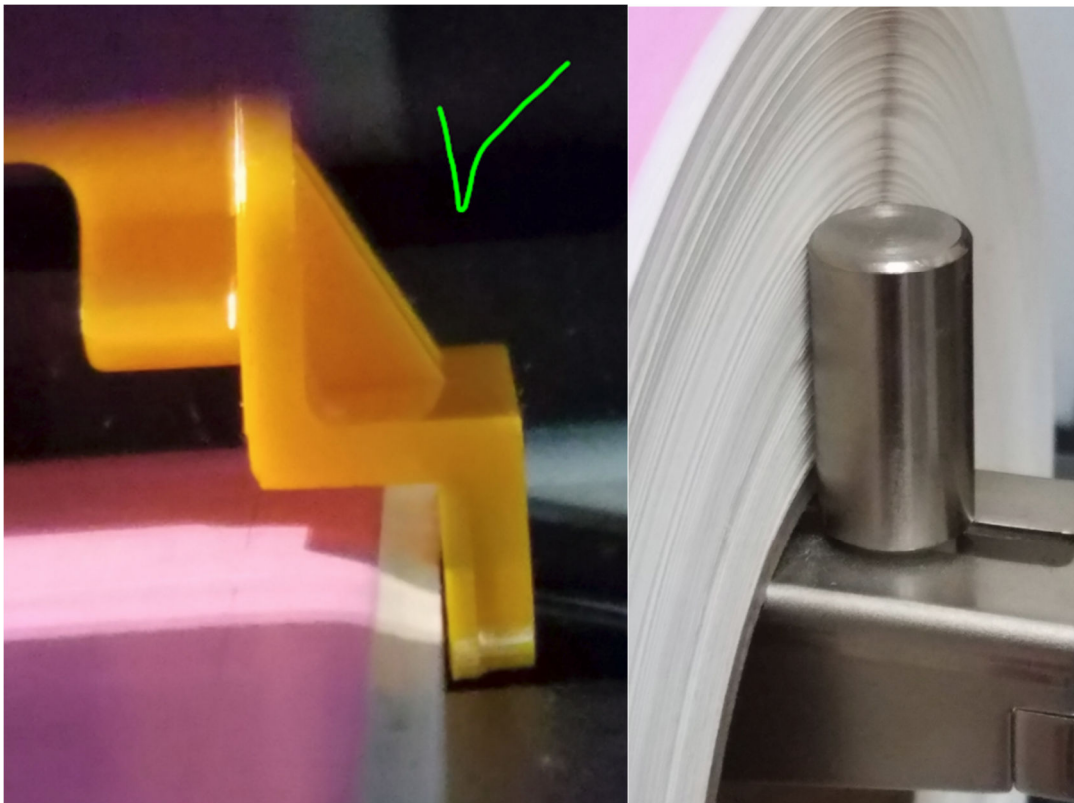
- These values are available within the RFID Submenu on the printer LCD.

PROG POS.	ANTENNA	READ PWR	WRITE PWR
F2	A4	20	20
F2	A4	19	19
F2	A4	19	19
F0	A4	26	27
F2	A4	18	18
F2	A4	21	21
F2	A4	20	21
F1	A4	21	23

F0	A2	25	25
F0	A4	24	25
F2	A4	21	21
F0	A4	24	25
F0	A4	24	25
F0	A2	23	24
F2	A4	21	21
F0	A4	23	24
F2	A4	19	20
F0	A2	24	25
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 area. 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. 2) Darkness setting is too high. 3) Pressure dials are set unevenly. 4) Worn platen drive roller 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

- Host generating spool files may not be sending RFID encoding commands to the printer. Perform the **ZT410R Encoding Check PDF** that is located on the IR Comply website Step 12 to confirm the EPC Data matches <https://lowrysolutions.com/ir-comply/>
- Supplier Side: eBots Registry Change has not been accomplished. See <https://lowrysolutions.com/ir-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/ir-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.
- 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.
- **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**
 - Intel(R) Graphics Settings

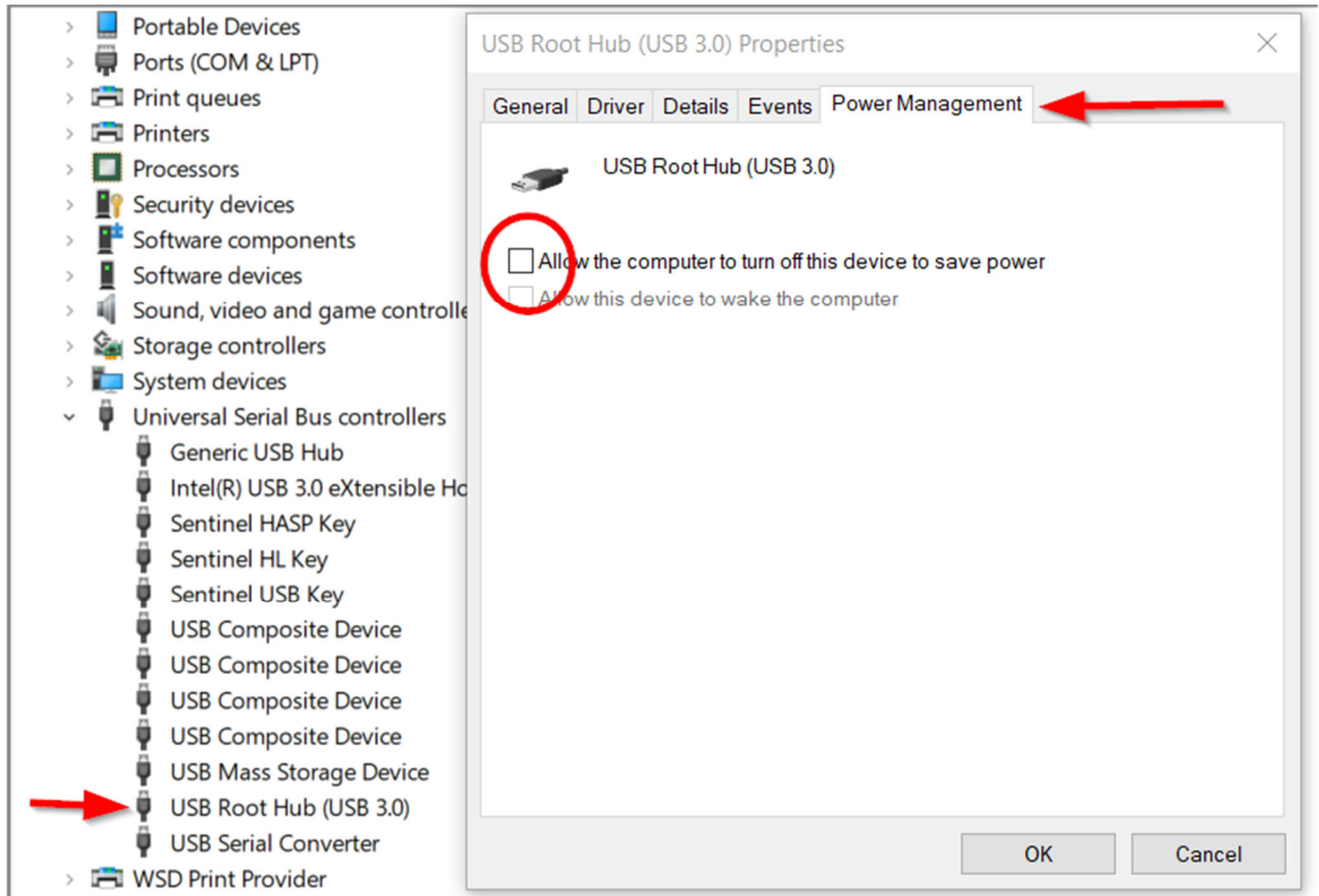
Restore plan defaults

OK Cancel Apply

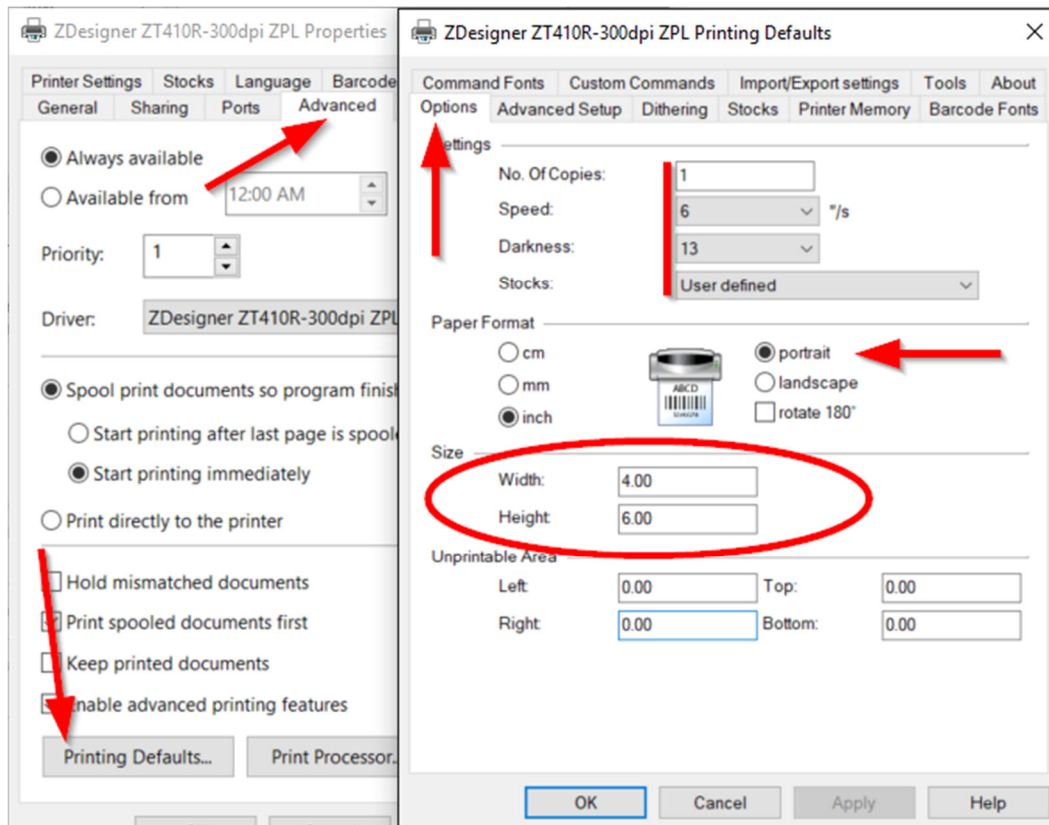
Change setting
Choose the sleep ar

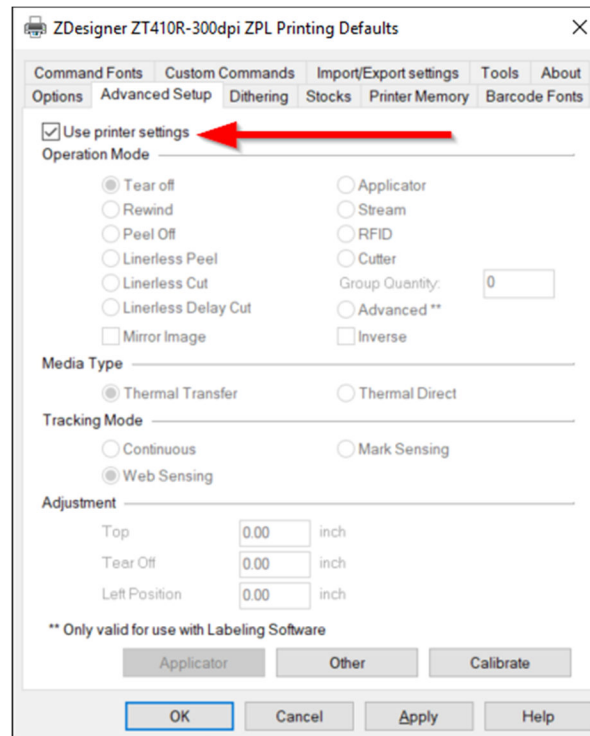
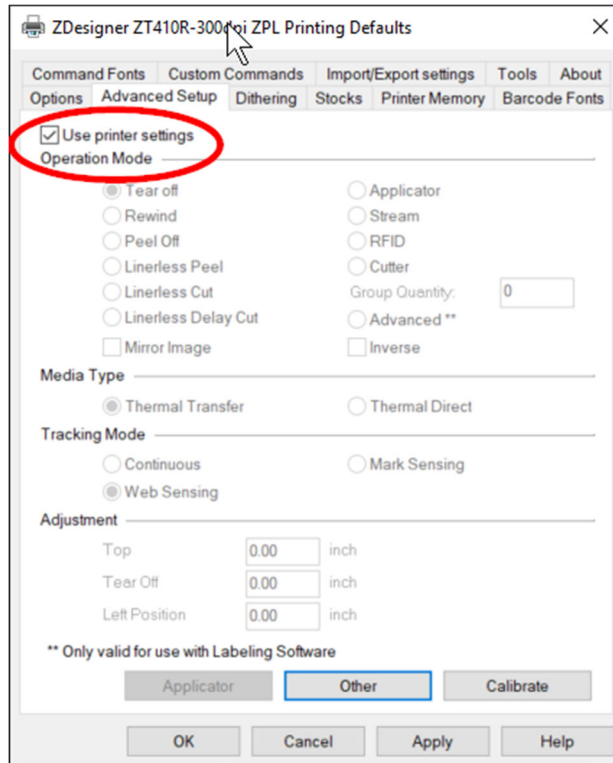
- Turn off the dis
- Put the comput
- Adjust plan bri
- Change advanced p**
- Restore default sett

- 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

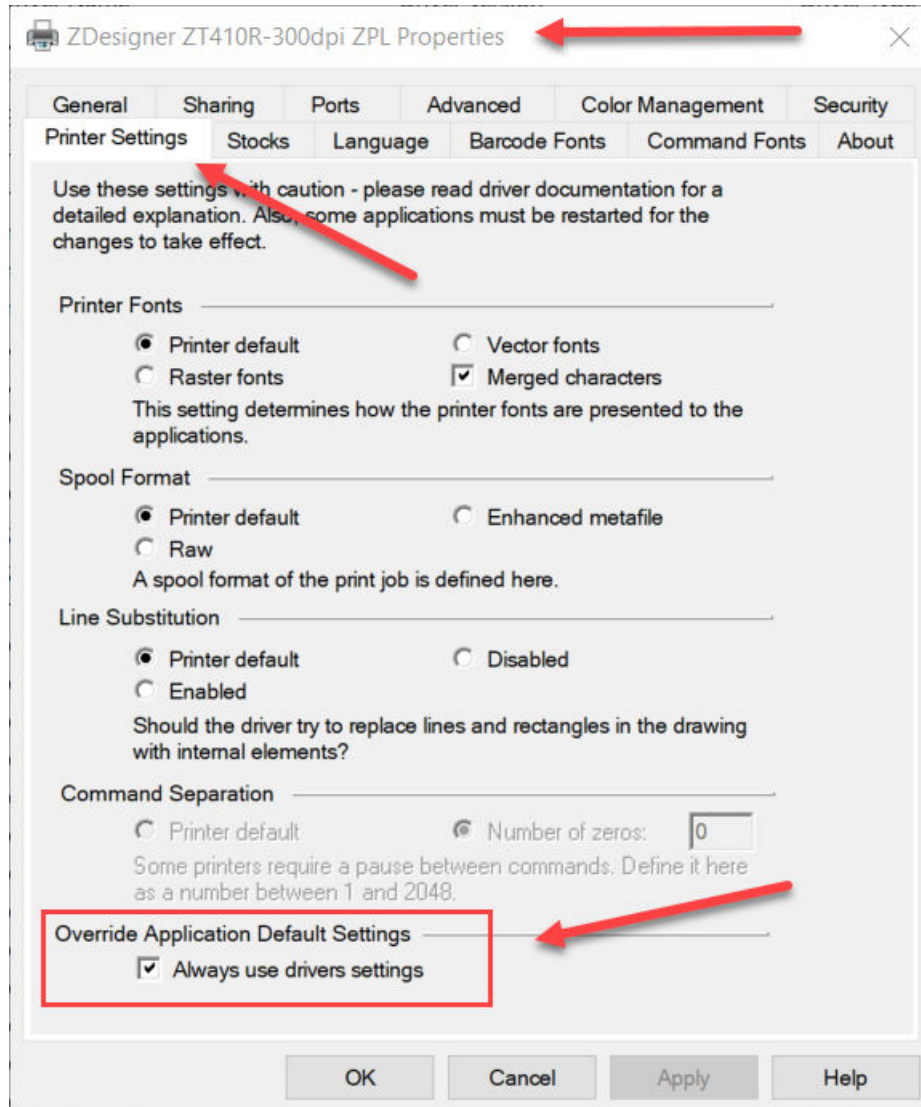


- Resolution for Printer settings are changing at random on USB (or LAN) connections
 - Configure the printer driver **Printer Properties>Advanced> Printing Defaults** for the 4 X 6 RFID Label Form and select *“Use printer settings”* for printer under the Advanced Setup tab.





- 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.



- 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.

- Resolution for Network IP Communication problems
 - On printers web page, go to **Print Server settings >TCP/IP settings** and set **IP Protocol = permanent**, Check **Default Address Enabled** and set the **ARP Broadcast Interval** to **3 minutes**. Then click **Submit** and then click on the reset link to enable the change.

TCP/IP Configuration

IP Address:

IP Protocol:

Default Address Enabled: Default Address

Subnet Mask:

Default Gateway:

WINS Server IP Address:

Connection Timeout Checking:

Timeout Value (secs):

ARP Broadcast Interval (mins):

Base Raw Port Number:

Configuration Successfully Set.

[The unit must be reset for new values to take effect.](#)

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