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Introduction

About this Manual

This manual will be updated as, from time to time, printer functions and features may be added or amended. You will always find the latest edition on our web site (http://www.zebra.com). If you require functions not found in this manual edition, please contact Technical Support for your region or the Zebra partner the printer was purchased from.
## Technical Support via the Internet

Technical Support via the Internet is available 24 hours per day, 365 days per year.

**Web Site:** [www.zebra.com](http://www.zebra.com)

**E-mail Back Technical Library:**
- E-mail address: emb@zebra.com
- Subject line: EmailList

**Self Service Knowledge Base:** [www.zebra.com/knowledgebase](http://www.zebra.com/knowledgebase)

**Online Case Registration:** [www.zebra.com/techrequest](http://www.zebra.com/techrequest)

### Contacts

<table>
<thead>
<tr>
<th>Which Department Do You Need?</th>
<th>The Americas</th>
<th>Europe, Middle East, and Africa</th>
<th>Asia Pacific and India</th>
</tr>
</thead>
<tbody>
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</tr>
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<td>E: China: <a href="mailto:GCCmarketing@zebra.com">GCCmarketing@zebra.com</a> All other areas: <a href="mailto:APACChannelmarketing@zebra.com">APACChannelmarketing@zebra.com</a></td>
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</tr>
</tbody>
</table>

| Key: | T: Telephone F: Facsimile E: E-mail |

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6 | 11/04/2009

P1021708-001
The TTP 2100 series of ticket printers are available both for kiosk integration and desktop use.

They print on most ticket media from 50 mm to 82.5 mm wide using direct thermal printing. The ticket media can be up to 0.25 mm thick, fanfold, roll, or single cut handfed.

The printers have integrated guillotine cutter, straight presenter, and control board. The print speed is up to 150 mm per second and the eject speed 300 mm/s to ensure high throughput.

The cut can be synchronized with:

- Gaps between tickets, or punched holes
- Black-marks on the non thermal side of the ticket stock
- Foil opacity (for labels on opaque foil backing)
- Ticket corner radius
- Label gaps (for adhesive labels on backing/liner)
You can also print fixed- or variable-length tickets without synchronization. The presenter can be set to eject the ticket into a tray or hold it by the back edge until the customer takes it. The top can easily be opened to give the operator access to the paper path, and printhead, for maintenance purposes.

**Figure 1 • Principle of Operation**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control panel on both sides</td>
</tr>
<tr>
<td>2</td>
<td>Cutter</td>
</tr>
<tr>
<td>3</td>
<td>Tickets fall (into tray)</td>
</tr>
<tr>
<td>4</td>
<td>Ticket sensor (taken/fallen)</td>
</tr>
<tr>
<td>5</td>
<td>Straight presenter</td>
</tr>
<tr>
<td>6</td>
<td>Ticket load sensor</td>
</tr>
<tr>
<td>7</td>
<td>Printhead</td>
</tr>
<tr>
<td>8</td>
<td>Upper media sensor (IR light source), adjustable sideways</td>
</tr>
<tr>
<td>9</td>
<td>Top release lever</td>
</tr>
<tr>
<td>10</td>
<td>Paper entry</td>
</tr>
<tr>
<td>11</td>
<td>Lower media sensor (IR light receiver), adjustable sideways</td>
</tr>
<tr>
<td>12</td>
<td>Control board</td>
</tr>
</tbody>
</table>
The upper media sensor is an IR light source that illuminates the media. The lower media sensor is an IR light receiver. These sensors must work together to sense media gaps or out-of-media conditions.

The printer is available with two different control boards; the TTP 2110 with serial interface and the TTP 2130 with USB interface.

A printer driver for Microsoft Windows™ is available, and the TTP 2130 interface is compatible with the Plug and Play standard.

The KPL control command language makes it easy to print directly from the ticket software without using a driver. This is especially useful for the serial interface version with its limited data transfer rate.
**Presenter**

The TTP 2100 does not loop the media. The presenter carries the media through the printer for presentation to the user.

**Eject Mode**

The ticket is ejected after being cut. The printer is designed so that the ticket always drops down. A sensor is located at the exit of the presenter to ensure that the printer can verify that the ticket drops down. To enable this functionality set “Clear presenter after print” in the driver printing preferences or enable the appropriate parameter setting if using direct print commands.

**Hold Mode**

When presented, only the very end of the printout is held by the printer so the customer can easily take the printout no matter how long or short it is. If a customer is printing more than one ticket, the printer can detect when the first is taken and automatically print the next and hold that ticket until taken, continuing this process until all tickets have been printed.

**Figure 2 • The Presenter**

- **Print and drop**

- **Print and take**
The buttons and indicators are duplicated on both sides of the printer so that they are easily accessible regardless of how the printer is installed.

**Feed Button**

The **Blue** Feed button has several functions:

- Press and release will feed, cut, and present a complete page.
- Any data in the print buffer will be printed. If the buffer is empty the page will be blank. In black-mark mode, the page will be synchronized with the black-mark.
- Press and hold Feed while turning on the power will print a self-test printout (See *Making a Self-Test Printout on page 28*).
- If the printer has firmware version 3.83 or higher, press and hold the Feed button for 3 seconds to print a self-test printout.
- With no paper in the printer, hold the Feed button pressed while closing the printhead to enter TOF mark calibration mode (see *Print Setup on page 86*).
Power Indicator

- When the green power indicator is illuminated, a 24V supply is connected to the printer.

Status Indicator

- The status indicator has several functions:
  - **ON constantly** — the printer is operational
  - **Flash, flash, pause, flash, flash** — is the warning-code for paper low.
    The warning-code is reset automatically when the condition causing it is removed. This behavior is disabled by default but can be enabled by setting parameter 52 (Warning Level) to 1.
  - **Flashes rapidly** — indicates error. Hold down the Feed button and the number of flashes will reflect the status-code.

**Table 1 • Status Indicator Flash Codes**

<table>
<thead>
<tr>
<th>Number of Flashes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Presenter jam, paper cannot be ejected</td>
</tr>
<tr>
<td>2</td>
<td>Cutter cannot return to home position</td>
</tr>
<tr>
<td>3</td>
<td>Out of paper</td>
</tr>
<tr>
<td>4</td>
<td>Printhead lifted</td>
</tr>
<tr>
<td>5</td>
<td>Paper did not reach presenter sensor in time</td>
</tr>
<tr>
<td>6</td>
<td>Temp error, printhead is above 60°C</td>
</tr>
<tr>
<td>7</td>
<td>Paper jam during present</td>
</tr>
<tr>
<td>10</td>
<td>TOF mark not found (on media load)</td>
</tr>
<tr>
<td>11</td>
<td>TOF mark calibration error</td>
</tr>
<tr>
<td>Fast flashes</td>
<td>Checksum error at firmware loading</td>
</tr>
<tr>
<td>Steady light</td>
<td>Wrong firmware type</td>
</tr>
<tr>
<td>Constantly off</td>
<td>Waiting for paper in TOF mark calibration mode</td>
</tr>
</tbody>
</table>

Status codes are reset:
- When the conditions causing them are removed
- When the printer is power cycled (turned off and then on)
- For all paper jam conditions, after the jam is cleared, lifting and lowering the printhead.
3 Installation

Installing a Paper Guide

The TTP 2100 printers are delivered without paper guide fitted.

1. Open the printhead by pushing the green printhead open lever backwards and lifting up the printhead. See Clearing Paper Jams on page 34.

2. Insert the T-shaped tabs of the paper guide into the “T”-holes, and press the rear of the guide down and in.

3. Fasten the nut using the 5 mm wrench supplied.

4. Close the printhead.

Figure 4 • Fitting the Paper Guide

When a guide is fitted, make an auto calibration with the ticket media that you are going to use in the printer. Most ticket medias auto calibrate perfectly, and the printer is ready to use. Should auto calibration fail on your media, set up paper width parameter n48, and sensor selected parameter n63 to reflect your media. Then redo the auto calibration.

5. Start the utility program Zebra Toolbox. This application is available from http://www.zebra.com.

7. Select Parameter 48 (paper width) and enter the value in millimeters of the desired print width.

<table>
<thead>
<tr>
<th>Paper Width</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>82.5 mm</td>
<td>n48=80</td>
</tr>
<tr>
<td>80 mm</td>
<td>n48=72</td>
</tr>
<tr>
<td>76 mm</td>
<td>n48=70</td>
</tr>
<tr>
<td>60 mm</td>
<td>n48=54</td>
</tr>
<tr>
<td>54 mm</td>
<td>n48=50</td>
</tr>
<tr>
<td>51 mm</td>
<td>n48=46</td>
</tr>
</tbody>
</table>

8. Select Upload One.
9. Select Parameter 63 (BM Sensor) and enter the desired value. Recommended values are:

<table>
<thead>
<tr>
<th>Value</th>
<th>When Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Auto selects 1 or 4 based on width of media loaded</td>
</tr>
<tr>
<td>1</td>
<td>(edge sensor) for ATB tickets without hole in the perforation.</td>
</tr>
<tr>
<td>2</td>
<td>(center sensor) for ISO tickets, most other ticket types, and adhesive labels</td>
</tr>
<tr>
<td>3</td>
<td>17.5 mm from center sensor</td>
</tr>
<tr>
<td>4</td>
<td>12.5 mm from center sensor (for baggage tags according to IATA 740)</td>
</tr>
</tbody>
</table>

10. Select Upload One.

11. Select Store Values to Flash PROM.

12. Wait for the printer to buzz as a confirmation that the new value is stored.
Top of Form (TOF) Sensor

The TTP 2100 has a flexible top of form detection system. When delivered the printer is configured with fork (transmissive) sensor to detect holes/gaps between tickets. The holes/gaps should be in the paper center, 12.5 mm to the right of the center (according to IATA resolution 740) or at the edge of 82.5 mm wide tickets (Boarding cards).

If the TOF mark is at a suitable position, an auto calibration routine will configure everything for you.

You can move the sensor to other positions, force the printer to use a specific sensor, switch to reflex (black mark) sensor for black-mark detection by setting up the parameters in the printer.

Selecting Fork (Transmissive) or Reflex (Black Mark) TOF Sensor

The TTP 2100 can use a fork (transmissive) sensor that looks for holes between tickets, or a reflex (black mark) sensor that looks for black-marks on the back of the ticket stock. Sensor mode is selected with parameter n61, see Summary of Parameter Settings on page 83.

Positioning the TOF Sensor

The sensor board containing the lower media sensor sits on a bracket that can slide left and right in a groove. This bracket is located below the ticket entry. The IR light source (upper media sensor) sits on a similar bracket above the ticket entry. When delivered, the bracket is positioned to the far right. In this position Sensor 1 is at the right side ready to detect the corner radius of Boarding cards, Sensor 2 is at the center of the page, and Sensor 4 is 12.5 mm to the right of the center at the position determined for baggage tags in IATA resolution 740. To configure the printer for other papers that do not fall into any of the three categories, complete the following steps:

1. Loosen the screw holding the sensor 1 ½ turns.
2. Press the screw in with the screwdriver and carefully slide it to the new position making sure the cables to the sensor do not obstruct the movement.
3. Tighten the screw.
4. Move the IR light source (upper media sensor) to the same position, directly above the sensor.

Note • The standard ticket guides have holes for the following sensor positions: Center, Edge, and 12.5 mm from center, and the sensor position must correspond to these holes.
Calibrating the TOF Sensor

1. Open the printhead.
2. Remove ticket stock.
3. Press and hold the Feed button, and then close the printhead (keeping the button pressed all the time).
4. Release the button.
   The Status LED should be off.
5. Load ticket stock (slide it into the paper guide and let the printer auto load the paper).
   Note • To ensure good calibration conditions, lightly press the ticket stock towards the bottom of the input guide during calibration.
   The printer will forward the paper until it finds two TOF marks and then stop and save all TOF-mark parameters.
6. Open the printhead and remove the ticket stock.
7. Close the printhead and feed the tickets in through the paper guide again.
   The printer is ready for use.

Repeat this procedure if the calibration fails or if the printer is used with tickets that differ from the original specification.

Note • If you use the Dual guide 01990-400 on your printer, you must calibrate twice (once in the wide paper path and once in the narrow). The printer will choose the appropriate set of parameters based on which paper path contains ticket stock.
The TTP 2100 Kiosk is for embedded applications and should be installed in an enclosure such as a self-service kiosk.

**Caution • NEVER use screws that go into the printer more than 4 mm! Longer screws will destroy the electronics inside.**

The “TTP 2100 Desktop” is a stand alone printer in a housing. The housings can be stacked so two or more printers can reside on top of each other to save space.
Orientation

The TTP 2100 can be installed at any angle. Horizontal is the most common use but vertical with the ticket presenting upwards can be used if you want the ticket to come up from the desk surface. Vertical with the ticket presented downwards can be used if you want to stack many tickets before picking them up.

Figure 5 • Printer Installation Orientation Options
Quick-Fit Hubs

The printers attach to the kiosk in two ways:

- using two screws
- using slides with leaf spring retainers and the quick-fit hubs.

Figure 6 • Front, Bottom View
Design Your Own Mounting

The illustration below gives an example of a printer-mounting shelf. See Dimensions on page 120, and the 3D solid models and outline drawings for CAD that are available on http://www.zebra.com.

Figure 7 • Example of a Simple Shelf for Fastening a Standard Printer Using Quick-Fit Hubs and a Leaf Spring Retainer (Order No. 01473-000)

Additional space is required for paper loading and paper jam removal. Consider mounting the printer on a movable platform so that the printer can be maintained outside the printer enclosure.

Note • We recommend you to make the output slot 97 mm wide. This way you will be able to use all paper widths that the TTP 2100 series of printers can handle.
Electrostatic Discharges and Earth Currents

Preventing ESD and earth currents from affecting the printer operation requires proper connection of the printer chassis to protective earth through a mounting platform or through a separate earth conductor. A threaded hole for an M4 earth screw is provided on the back of the printer. Use an M4 x 10 screw and two lock washers when fastening the ground cable.

![Figure 8 • Location of Earth Grounding Screw](image)

Caution • NEVER use screws that go into the printer more than 4 mm! This will destroy the electronics inside.

Note • An optional antistatic brush can be fitted to the front of the printer if required.

Ambient Light

There is an optical sensor at the paper exit at the front of the printer.

To ensure proper printer operation, design the kiosk so that it prevents direct sunlight or light from indoor lamps from reaching the sensor through the paper exit.
Installing a Paper-low Sensor (Optional)

A paper-low sensor alerts the system that the media stock level is running low. The paper-low sensor works with paper rolls and fanfold media. The purpose of this sensor is to get an early alert so that you can replace the ticket stock in time in remotely located kiosks.

Roll holders supplied by Zebra can be equipped with paper-low sensors. Attach the sensor and connect the cable to the paper low connector at the back of the printer.

Figure 9 • Paper-low Sensor Connection

Figure 10 • Location of Paper-low Connector
Connecting to the Computer

Figure 11 • Location of Interface Connector

TTP 2110

Connect a Zebra serial cable, ordering No. 10825-000, between the printer and the computer to be used. We strongly recommend using the Zebra cable because many incompatible cables are available, which may cause communication problems.

Figure 12 • Serial Interface Cable 10825-000.

Dotted leads are not connected in the printer. To be able to connect the cable in any direction, make symmetrical cables.
TTP 2130

Connect the printer to the USB port of the computer or the USB hub to be used. USB connectors can be recognized by the following symbol:

The connector on the printer is a 4-pin USB type B connector. See Table 4, *USB Connector (J13) Pin Assignment* on page 105 for pin assignment.

A suitable cable is available from Zebra, part number 105850-028.

*Figure 13 • USB Cable with Type A and Type B Connectors*
Connecting the Power

Caution • Using a non-Zebra power supply may cause excessive EMC interferences and void the EMC certifications of the printer.

Caution • To avoid electrical shock and printer damage, wiring of a non-Zebra power supply should only be done by qualified service personnel. Use ONLY a power supply which meets the following minimum requirements:

- 24 VDC ±5%
- 70W average (2.92A) and 284W peak (11.8A) power supply

Caution • On power supplies with line voltage selector, make sure it is set to your local line voltage.

Using the appropriate Zebra power supply for TTP 2100 Desktop, or Embedded (70W Power Supply on page 122):

1. Connect the cable from the power supply the power connector on the back of the printer.
2. Connect the power cable to the line outlet.
3. Turn ON the power.
In kiosk applications you may draw power from a common PSU in the kiosk if the characteristics are suitable. In such a case, cables that fit the connector on the back of the TTP 2100 are available from Zebra. If you make cables of your own, connect the voltages according to the following illustration.

**Note** • Protective ground and minus output should *not* be interconnected in the power supply.

At the printer end of the cable, use a Tyco Mate-N-Lok connector housing and two contact-sockets.

![Figure 15 • Power Connection](image)

**Table 2 • Current Consumption**

<table>
<thead>
<tr>
<th>Mode</th>
<th>58-60 mm paper width</th>
<th>80 – 82.5 mm paper width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle</td>
<td>150 mA</td>
<td>150 mA</td>
</tr>
<tr>
<td>Standard text printing</td>
<td>0.7 A average</td>
<td>1 A average</td>
</tr>
<tr>
<td>All black printing</td>
<td>4 A</td>
<td>6 A</td>
</tr>
</tbody>
</table>
Making a Self-Test Printout

A Self-Test Printout provides a printout showing information specific to the printer, including:

- Firmware version
- Control board (PCA) revision
- Paper width
- Serial number
- Installed fonts and logotypes
- Parameter settings
- Barcode support

To make a Self-Test Printout:

1. Enter Self-Test Mode using one of the following methods:

<table>
<thead>
<tr>
<th>If…</th>
<th>Then…</th>
</tr>
</thead>
<tbody>
<tr>
<td>the printer has firmware version 3.83 or higher</td>
<td>Press and hold the Feed button for 3 seconds.</td>
</tr>
</tbody>
</table>
| the printer has firmware lower than version 3.83 | a. Press and hold the Feed button just after closing the print head.  
  b. See Figure 16. Press and hold the Feed button (1) while turning on the power (2) to the printer.  
  c. Hold down the Feed button until printing starts. Each successive time the Feed button is pressed will produce an additional Self-Test printout until Self-Test Mode is exited.  
  d. Exit Self-Test Mode by power cycling the printer (turning the power off then on again). If the power switch is not easily accessible, open and close the print head. |

Figure 16 • Locate the Feed Button and On/Off Switch
Customizing the Self-Test Printout

The self test printout starts with a text line, and then a Zebra logotype. This logotype is just a printout of logotype No. 0, so if you want to personalize the self test printouts in your installation, delete all logotypes and store your own logotype as No. 0.

See also Logotypes on page 78.

Figure 17 • Logotype No. 0 is Printed on the Self-Test Printout
Installing a Printer Driver

Loading Fanfold Ticket Stock

1. Turn the tickets so that the surface to be printed (temperature sensitive side) faces upwards. Put the first ticket on the input guide and slide it up the guide into the printer.

2. The printer will feed the paper, locate the edge and reverse to printing position.

3. When ready, the yellow status led will be ON indicating that the printer is ready to be used.

Note • Remember that the thermal coating should be upwards and black-marks (if used) should face down. The printer will automatically load the tickets when the sensors detect a ticket is loaded.
Installing a Paper Roll

1. Turn the new paper roll as shown. The paper should be inserted into the printer with the temperature-sensitive side up so that the paper leaves the roll from the top.

![Figure 19 • Installing a Paper Roll](image1)

2. Tear off a full turn of the paper from the new paper roll.

**Caution** • This is important since the outer end of the paper is usually fixed to the roll with some type of glue or self-adhesive substance that might otherwise cause paper jam or even printhead damage.

![Figure 20 • Remove Outer Layer of Paper Roll](image2)

3. Make sure the printer is turned ON.

4. Insert the ticket stock through the paper entry opening at the back of the printer.

**Note** • The ticket sensor is at the center of the print width. If the ticket edge is torn off in such a way that the sensor does not see it, auto load will not be triggered. If so, reshape the edge so that the sensor sees the ticket stock.
5. Press the Feed button so that the printer feeds, cuts, and ejects a page. This ensures that the first ticket printed will have a straight edge.

Figure 21 • Example of Bad Page Edges

OK OK

Wrong! Wrong! Wrong!
Clearing Paper Jams

Should a paper jam occur, follow the procedure below:

1. Open the printer lid.
   a. Press the green release lever toward the rear of the printer.
   b. Lift the lid.

2. Remove all jammed paper, make sure the paper path is clear, and close the lid.

Figure 22 • Opening the Lid

Figure 23 • Remove Paper Trash