Ticket Printer/Encoder
Model TTPM2

Technical Specification
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REVISION HISTORY

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<td>Page 21</td>
<td>Current consumption for OEM mechanism clarified</td>
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<td>Updated order number list</td>
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1 INTRODUCTION

The TTPM2 is a ticket printer/encoder with versatile paper handling. It encodes data on a magnetic stripe and prints text, graphics and bar codes. Finally, it cuts and ejects the ticket. The tickets can be credit card size (54x86 mm), or 54x110 mm. Fanfold or roll ticket stock, or single tickets can be handled, in one or two ticket feed tracks.

Already printed and encoded tickets can be read and re-encoded, and print can be added, for example to change the ticket validity.

1.1 Versions and configurations

The TTPM2 comes in two basic versions, the desktop printer with enclosure and built-in power supply, and the OEM printer mechanism for kiosk applications. Both these versions are available in a number of configurations, and can also be modified according to customer requests.

![Figure 1. Front view, desktop printer, and OEM printer mechanism](image1)

![Figure 2. Rear view, desktop printer, and OEM printer mechanism](image2)
A TTPM2 with card dispenser loads sheet cut tickets into the lower track of the printer, leaving the upper track for single ticket handling.

The card dispenser can be ordered with an optional paper low switch.
To avoid paper jam, the TTPM2 has a straight paper path where tickets pass virtually without bending.

The input module has two ticket tracks:

The upper track is normally used for single tickets, but there is a printer version in which the upper track is configured for consecutive ticket stock. The upper track is also used for handling of tickets inserted through the front load entry/exit.

The lower track always handles consecutive ticket stock. Both fanfold, roll, and card dispenser ticket stock can be used. The lower track ticket entry is at the back of the printer. Ticket stock in lower track can be retracted to a standby position to clear the paper path for tickets from the upper track, then automatically loaded again when needed.

Tickets can be parked in an active position ready for being encoded, decoded, printed or cancelled.

The magnetic stripe encoder/decoder has separate heads so that it can encode, read and verify the data in one single sweep.
1.2 Installation considerations

The TTPM2 OEM printer mechanism is designed to be installed in some kind of enclosure such as a self service kiosk.

Preventing ESD and ground currents from affecting the printer operation requires proper connection of the printer chassis to protective ground through a mounting platform or through a separate ground conductor.

Trouble free printer operation also requires that the printer’s optical sensors be shielded from ambient light.

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

1.2.1 Power supply

The printer mechanism requires +5 Vdc 0.35 A, and +24 Vdc 2 A continuous, 6 A peak. At standby, no current is drawn from the +24 Vdc.

With a Swecoin power supply unit (see ordering information on page 32, and dimensions drawing on page 26), just connect the cable from the power supply to control board connector J5.

If you use another type of power supply unit, connect the voltages according to the following table. At the TTPM2 end of the cable, use a Molex 22-01-2065 connector housing, and six Molex 08-50-0032 contact springs:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5 V</td>
</tr>
<tr>
<td>2</td>
<td>Ground (for 5 V)</td>
</tr>
<tr>
<td>3</td>
<td>+24 V</td>
</tr>
<tr>
<td>4</td>
<td>+24 V</td>
</tr>
<tr>
<td>5</td>
<td>Ground (for 24 V)</td>
</tr>
<tr>
<td>6</td>
<td>Ground (for 24 V)</td>
</tr>
</tbody>
</table>

Figure 5. Power supply connector J5 pin assignment

NOTE! – Both the 5 V and 24 V ground, as well as the chassis of the printer, must be connected to ground potential (safety ground).
### Communications cable

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>RXD (Receive data)</td>
</tr>
<tr>
<td>3</td>
<td>TXD (Transmit data)</td>
</tr>
<tr>
<td>4</td>
<td>DTR (Data terminal ready)</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>RTS (Request to send)</td>
</tr>
<tr>
<td>8</td>
<td>CTS (Clear to send)</td>
</tr>
</tbody>
</table>

**Figure 6. RS232 serial interface connector pin assignment**

A serial communications cable is available from Swecoin. See ordering information on page 32. The cable is 1.5 m long with 9-pole D-sub connectors at both ends. 9-pole to 25-pole D-sub adapters are commercially available.
PERFORMANCE

Typical throughput: 20 tickets/minute (3s/ticket) when printing and encoding already downloaded information on 86 mm tickets.

NOTE! – Data transfer time is not included in the above throughput. Typically add 0.3 s fixed time + 1 s/Kbytes of transferred data.

Read/decode speed: 150 mm/s
Cut time: 0.2 s
Bar codes: For east and west oriented bar codes, the print speed is reduced to approx. 50 mm/s

Track swapping time: In dual consecutive track printers (both from lower to upper, and from upper to lower): 1.2 s
Card dispenser: First ticket loading time: 2 s
Loading time for following tickets: Loading is concurrent with printing of previous ticket. Total throughput is not affected by card dispenser.
3  MAGNETIC STRIPE DATA

3.1  Encoding

Track combinations  ISO track 2 and ISO track 3, standard (with HiCo, only one track at a time can be used for encoding or reading)
ISO track 1 and ISO track 2
Single center track

Track density  Track 1: 210 BPI
Track 2: 75 BPI
Track 3: 210 BPI
Center Track: 75 or 210 BPI, (must be specified when ordering printer)

Special versions with 105 and 161 dpi available on request.

Coercivity  Low: 300 Oersted ISO7811-2 (standard)
High: 2750 Oersted ISO7811-6 (for household-magnet proof encoding)

Other non-standard coercivities available on request.

Encoding format  ISO 7811-2 format, or hexadecimal format. Software selectable.

Synchronization  Hex encoding: Synchronization zeroes must be added in the beginning of the message. 6 zeroes for 75 BPI tracks and 15 zeroes for 210 BPI tracks. Zeroes are automatically added from the end of the string to the end of the ticket.

ISO encoding: Sync. digits, start, stop, and check digit are automatically added.

Coding length  About 80 mm regardless of ticket length

Useful message length  Track 1: 492 bits (123 hex, or 79 6-bit characters)
Track 2: 200 bits (50 hex, or 37 5-bit characters)
Track 3: 492 bits (123 hex, or 95 5-bit characters)

Read-after-write  Automatically performed (can be disabled).

3.2  Decoding

Tracks  ISO encoded data on tracks 1—3 can be read, decoded and transmitted to the host computer.
Hex coding on track 2 can be read and transmitted to host computer.
Software selectable number of read/decoding retries.

See also "Document stock" on page 21 for specification of stripe position, etc.
4 PRINT DATA

4.1 General

- Printing method: Direct, parallel, thermal print
- Print width: 384 pixels = 51.06 mm
- Ticket size: 54x86 mm and 54x110 mm

4.2 Graphics printing

- Pixels/line: 384
- Resolution, X-axis: 7.52 pixels/mm (191 dpi)
- Resolution, Y-axis: 5.7 pixels/mm (145 dpi)
- Max graphics size: 384x400 pixels if all ticket memory is used for graphics.
- No. of graphical elements: Limited only by the size of the fixed ticket memory.

4.3 Bar code printing

- Bar code standards: EAN-13 (UPC-A): 13 digits printed as bar code. Check digit (digit 13) must be calculated in host computer and sent to the printer. Automatic wide/narrow bar ratio setting.
  - Code 39: Variable No. of characters in upper case alphanumeric coding. Leading and trailing asterisk added automatically. Independently selectable bar width (narrow or wide).
  - 2-of-5 interleaved.
- Basic height: 16 pixels (2.8 mm for north and south orientated bar codes, 2.1 mm for east and west orientated bar codes)
- Scaling: From 1 to 16 x basic height
- Orientation: North, South, East and West oriented bar codes (see also "Performance" on page 10)
- No. of bar codes: Up to 15 bar codes/ticket
4.4 Text printing

Fonts
Three mono spaced and one proportionally spaced font. Custom designed fonts can be ordered.

Character size, W x H
Font 1 and 3 = 8 x 16 pixels. Font 2 = 16 x 30 pixels. Font 4, width = 4 to 8 pixels depending on character, height = 16 pixels.

Scaling
Font 1 and 4: From 1 to 16 x nominal size. Scaling in X and Y direction are independent of each other.
Fonts 2 and 3: Width from 1 to 3 x nominal size, height from 1 to 16 x nominal size

Text orientation
The proportionally spaced font (font 4), and one mono spaced font (font 1) can be printed in any of the four orientations North, South, East and West. The other two mono-spaced fonts can only be printed in North orientation.

Text field contents
Fixed, or variable text

No. of text fields
Up to 16 text fields and 16 variable fields/ticket

Basic character set
The table below shows the basic characters stored in PROM on the printer control board. The set contains printable characters from decimal position 32 (space) through 127.

<table>
<thead>
<tr>
<th>Dec</th>
<th>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5</th>
<th>6 7 8 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hex</td>
<td>00 01 02 03 04 05 06 07 08 09 0A</td>
<td>0B 0C 0D</td>
</tr>
</tbody>
</table>
| Key | NU/
|     | ENQ  | ACK  | LF  | CR  | NAK  |

<table>
<thead>
<tr>
<th>Dec</th>
<th>16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hex</td>
<td>10 11 12 13 14 15 16 17 18 19 2A 2B 2C 2D 2E 2F</td>
</tr>
<tr>
<td>Key</td>
<td>32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dec</th>
<th>48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hex</td>
<td>30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F</td>
</tr>
<tr>
<td>Key</td>
<td>00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dec</th>
<th>48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hex</td>
<td>30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F</td>
</tr>
<tr>
<td>Key</td>
<td>00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Dec</th>
<th>48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hex</td>
<td>30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F</td>
</tr>
<tr>
<td>Key</td>
<td>00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dec</th>
<th>48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hex</td>
<td>30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F</td>
</tr>
<tr>
<td>Key</td>
<td>00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dec</th>
<th>48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hex</td>
<td>30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F</td>
</tr>
<tr>
<td>Key</td>
<td>00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F</td>
</tr>
</tbody>
</table>

Table 1 Character set used in firmware versions up to 906-360

NOTE! – Decimal 34/HEX 23 (’) cannot be used in messages as it is used as string identifier in the programming language of the printer.
From firmware version 906-370, characters 128 to 255 were added. Customer firmware (not beginning with 906) may contain other characters than the ones shown below. Cyrillic and Hebrew versions available.

| DEC | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| Hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| Key | NUL | ETX | ENQ | ACK | LF | CR | CAN | SP | ! | $ | % | & | ' ( ) * + , - . / | |
| Dec | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| Hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| Key | NUL | ETX | ENQ | ACK | LF | CR | CAN | SP | ! | $ | % | & | ' ( ) * + , - . / | |

**NOTE!** – Decimal 34/HEX 23 (" ") cannot be used in messages as it is used as string identifier in the programming language of the printer.

Table 2 Character set used from firmware versions 906-370
5 TICKET SEPARATION AND CANCELLATION

5.1 Separation

5.1.1 Gapped tickets
For specification of gapped tickets, see page 30.

Cutter
Guillotine-type, DC-motor operated, with camshaft, micro-switch controlled

Cutter position
Between encoding/decoding module and printhead

Cutter life expectancy
500,000 cuts or more

5.1.2 Non-gapped tickets
For specification of non-gapped ticket, see page 31.

Burst separator
Strikes the ticket stock across the perforation so that the tickets burst apart. DC-motor operated, with camshaft, micro-switch controlled

Separator position
Between encoding/decoding module and printhead

Separator life expectancy
1,000,000 separations or more

5.2 Cancellation

Tickets that fail magnetic encoding, and tickets that the host computer consider to be invalid, expired etc. can be cancelled by the TTPM2.

Repeated read attempts
Software selectable

Cancellation print
Striping of entire print area. User defined print on top of cancellation striping, for instance "VOID".

Encoding cancellation
Magnetic code is automatically erased on cancelled tickets.

Output of cancelled tickets
Cancelled tickets are returned to the operator or, in case of printers equipped with Front Load 2 or 3 option, they can be redirected to a waste bin ticket-exit.

Retract
Printers equipped with Front Load 2 or 3 option can retract uncollected tickets and redirect them to the wastebasket inside the kiosk.
6 CONTROL BOARD

Controller 8-bit micro controller type Dallas 80C320
Firmware memory 512 Kbytes EPROM
Page memory 128 Kbytes nonvolatile (battery backed up) RAM
Backup battery Expected life: 7 years
Type: 3V Lithium (Varta CR2025 or equivalent)
Interface Serial: RS232C (V.24)
Data format 8 data bits, 1 stop bit, no parity
Transmission speed 1200, 9600, 19200, or 115200 bps, switch selectable
Handshaking Hardware (RTS/CTS) or software (XON/XOFF)

Connection

<table>
<thead>
<tr>
<th>Connector</th>
<th>TTPM2 (9 pole)</th>
<th>PC (25 pole)</th>
<th>PC (9 pole)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 RXD</td>
<td>2 TXD</td>
<td>3 TXD</td>
<td></td>
</tr>
<tr>
<td>3 TXD</td>
<td>3 RXD</td>
<td>2 RXD</td>
<td></td>
</tr>
<tr>
<td>4 DTR</td>
<td>6 DSR</td>
<td>6 DSR</td>
<td></td>
</tr>
<tr>
<td>5 GND</td>
<td>7 GND</td>
<td>5 GND</td>
<td></td>
</tr>
<tr>
<td>7 RTS</td>
<td>5 CTS</td>
<td>8 CTS</td>
<td></td>
</tr>
</tbody>
</table>

Set up DIP-switches are accessible through the service opening at the bottom of the TTPM2 enclosure. The functions of these DIP-switches are (default settings in parenthesis):

<table>
<thead>
<tr>
<th>Switch 1</th>
<th>Bits/s</th>
<th>ON</th>
<th>OFF</th>
<th>1200</th>
<th>115200</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OFF</td>
<td>19200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 Read-after-write ON = Disable for ISO magnetic track 1 or 3 data (OFF)
4 Auto clear ON = Clear all fixed and variable data during printing (OFF)
5 Handshaking ON = XON/XOFF, OFF = RTS/CTS (OFF)
6 ACK/NAK + error code ON = enabled, OFF = Silent (ON)
7 Mode Standards ON | OFF | Standard ON | DCT OFF | DCD200 ON | Test ON |
8

Standard = Consecutive lower track + single-ticket upper track
DCT = Dual Consecutive Track (formerly called SGA)
CD200 = Card dispenser mode
Test = Reserved setting, not to be used!
7 COMMAND SET

The command set is designed in accordance with industry standards and is enhanced with functions unique to this product. The command language uses only printable ASCII characters for easy adaptation to any host system.

NOTE! – This chapter is only a summary. See the "Installation and Programming Manual" for full details.

7.1 Syntax

- A command string always starts with an exclamation mark (ASCII 33 or HEX 21) serving as command identifier.

- The characters immediately following the ! (21H) is the actual command to the printer. The command consists of 1—3 characters followed, when applicable, by a sub command, formatting commands, and data separated by space characters as shown in Figure 7.

- Carriage Return and Line Feed end each command.

![Command Syntax Diagram](image_url)

Figure 7. Command syntax

1 Only used with some commands
2 Graphical data starts directly without any quotation mark and ends after the specified number of bytes
7.2 Summary of commands

7.2.1 System related commands

!C   Clear all
!CA  Clear all and enable extended acknowledgement
!G   Set encoding speed
!P   Encode and print document
!P@  Encode and print document, and eject it in wastebasket (FL2 and FL3 printers)
!PE  Encode and print document, and eject it to tray (for FL3 printers)
!PS  Print slow
!PM  Print medium
!PF  Print fast
!U   Firmware version query
!S   Status request
ENQ  Status request immediate
!Q   Writes a transaction string to RAM
!V   Reads the transaction string written by !Q
!W   Reads thermal print progress indicator
!X   Set resolution
!Y   Read ticket counter
!Z   Burn time

7.2.2 Document entry related commands

!E   Ejects document through the upper rear document entry (for example after decoding)
!L1  Selects lower rear document entry, and waits if paper is out (for units with dual consecutive entries)
!L2  Selects upper rear document entry, and waits if paper is out (for units with dual consecutive entries)

---

1 Added in firmware version 01789-406
2 Added in firmware version xxxxx-399s
3 Added in 3.39zb
4 Added in firmware version xxxxx-332
5 Only in firmware 01660-xxx
6 Added in firmware version xxxxx-360
7 IL1, IL2, IL17 or IL18 must be selected on units with dual document entries
![L3] Loads document through front entry
![L4] Ejects document through front entry
![L5] Transports document to waste bin (only for printers with front load 2 and 3)
![L17] Selects lower rear document entry and signals if paper is out (for units with dual consecutive entries ¹)
![L18] Selects upper rear document entry and signals if paper is out (for units with dual consecutive entries ²)
![T] Sets timeout for retract function ³

7.2.3 Print-parameter related commands

![F T] Print text
![F G] Print graphics
![F C] Print bar code
![F M] Specifies No. of retries + cancellation text to be printed if encoding fails

7.2.4 Magnetic encoding/decoding related commands

![D] Reads and decodes data in ISO format from track 2 (or center track)
![D1] Reads and decodes data in ISO format from track 1
![D3] Reads and decodes data in ISO format from track 3
![I] Defines data to be encoded in ISO format on track 3
![J] Defines data to be encoded in ISO format on track 1
![K] Defines data to be encoded in Hex format on track 1 or 3 (as applicable)
![M] Defines data to be encoded in ISO format on track 2 (or center track)
![N] Defines data to be encoded in hexadecimal format on track 2 (or center track)
![N+] Same as !N but reverses the bit order ³
![O] Reads data in hexadecimal format from track 2 (or center track)

---

¹ Introduced in firmware version 3.75

² ![L1], ![L2], ![L17] or ![L18] must be selected on units with dual document entries

³ Added in firmware version xxxxx-332
**ERROR CODES**

TTPM2 reports error conditions in the form of error codes. An error condition is reported as a NAK (15H) followed by a one-character error code. The error codes have been defined, starting with ASCII character "1" (31H) according to the following table:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;1&quot;</td>
<td>No paper in the input path selected with !L1, !L2, !L17, or !L18.</td>
</tr>
<tr>
<td>&quot;2&quot;</td>
<td>Paper jam when executing !L1, !L2, !L17, or !L18.</td>
</tr>
<tr>
<td>&quot;3&quot;</td>
<td>Reserved.</td>
</tr>
<tr>
<td>&quot;4&quot;</td>
<td>Cutter error. No full cut performed. Cutter blade returned to home position by reversing the cutter motor.</td>
</tr>
<tr>
<td>&quot;5&quot;</td>
<td>Cutter error. Cutter blade not returned to home position.</td>
</tr>
<tr>
<td>&quot;6&quot;</td>
<td>Cutter error. Cutter blade not moving. If this error code is received immediately after power ON, it indicates that something is wrong with the +24V supply.</td>
</tr>
<tr>
<td>&quot;7&quot;</td>
<td>Paper jam when executing the !P command.</td>
</tr>
<tr>
<td>&quot;8&quot;</td>
<td>Magnetic encoding on track 2 (or center track) failed.</td>
</tr>
<tr>
<td>&quot;9&quot;</td>
<td>Magnetic encoding on track 1 or 3 failed.</td>
</tr>
<tr>
<td>&quot;A&quot;</td>
<td>Not possible to read magnetic information with !D command.</td>
</tr>
<tr>
<td>&quot;B&quot;</td>
<td>No document inserted within time limit following an !L3 command (front load).</td>
</tr>
<tr>
<td>&quot;C&quot;</td>
<td>Document inserted (front load) but immediately retracted.</td>
</tr>
<tr>
<td>&quot;D&quot;</td>
<td>Document inserted through front load is blocked.</td>
</tr>
<tr>
<td>&quot;E&quot;</td>
<td>Document blocked in the front load input feeder during an !L3 command. Also used when combining the characters</td>
</tr>
<tr>
<td>&quot;G&quot;</td>
<td>Document found in the ticket path during power on has been erased, VOID-printed and ejected.</td>
</tr>
<tr>
<td>&quot;P&quot;</td>
<td>If !P is sent to the printer and paper is out, it replies with NAK + P and discards data.(^1)</td>
</tr>
<tr>
<td>&quot;X&quot;</td>
<td>Critical error. This is issued when the printer must be turned off, error condition cleared, then turned off again.</td>
</tr>
</tbody>
</table>

---

**NOTE!** – For TTPM2 to send ACK, or NAK + error codes, the DIP-switch 6 on the TTPM2 control board must be set to ON. The DIP-switch position OFF places the unit in a silent mode preventing these codes from being transmitted to the host computer.

---

\(^1\) Introduced in firmware version 4.13
# 9 POWER REQUIREMENTS

## 9.1 Desktop printer

Supply voltage: 115 Vac or 230 Vac, switch selectable  
Supply current: Up to 4A at 115 Vac, and 2A at 230 Vac  
Fuse: 5x20 mm 3.15A/250V slow blow. Replacement fuse inside power cable receptacle  
Power consumption: 50—190 W depending on print density  
Frequency: 50—60 Hz

## 9.2 OEM printer mechanism

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 Vdc ±5%</td>
<td>Idle: 0 mA</td>
</tr>
<tr>
<td></td>
<td>Text printing: Average 2A, peak 6A</td>
</tr>
<tr>
<td></td>
<td>All black printing: 6A</td>
</tr>
<tr>
<td>5 Vdc ±5%</td>
<td>350 mA</td>
</tr>
</tbody>
</table>

Power connector: 6-pin Molex KK type connector, 2.54 mm division. Positioned at the rear bottom of the control board.
10 DIMENSIONS

10.1 Desktop printer

Figure 8. Desktop printer dimensions. All measurements are in mm.
Figure 9. Approximate space required around the printer
10.2 Desktop printer with CD200 and Front load mechanism

Figure 10. Desktop printer, dimensions. All measurements are in mm
10.3 OEM printer mechanism

![Diagram of OEM printer mechanism]

*Figure 11. OEM printer mechanism dimensions. All measurements are in mm*

10.4 Weight

Approximately 7200g
10.5 Power supply for OEM printer mechanism

Figure 12. Power supply 38-1035-002 dimensions. All measurements are in mm
11 ENVIRONMENTAL CONDITIONS

Temperature
- Operation: +5 °C to +40 °C
- Storage: −10 °C to +50 °C (without paper)
- Transportation: −10 °C to +50 °C (without paper)

Relative humidity
- Operation: 35–75%, non-condensing
- Storage: 10–90%, non-condensing (without paper)
- Transportation: 10–90%, non-condensing (without paper)

Shock and vibration
- Vibration tolerance during operation:
  - From 5 to 18 Hz with a displacement of 0.3 mm.
  - From 19 to 100 Hz at a constant acceleration of 0.2 g, peaked, swept sine wave.
- Shock during shipping:
  - Printers that are factory packaged for shipment can tolerate a drop of 800 mm without sustaining any damage.

12 MTBF

Complete unit
- Approximately 1.4 years for the typical user profile given below.

User profile:
- Operational: 12 month/year. Average 30 000 documents/month. Average printing density 20% black. Cleaning of printer every 2 months.

TTPM2 components
- Printhead: 1 000 000 tickets typically (54 x 86 mm)
- Control board: 65 000 hours typically
- Cutter: 500 000 cuts typically
- Read/write head: 1 000 000 tickets typically, with full tape stripe

NOTE! – Type of ticket stock and stripe material affects the life of the TTPM2 to a high degree. For maximum MTBF, avoid abrasive inks and coatings, inks with whiteners, and slurry stripes. Also clean the printer regularly.
13 DOCUMENT STOCK

The TTPM2 printers are produced and calibrated for the customers ticket stock. To ensure accurate ticket issuing, we do require 100 tickets of the customer ticket stock for each ordered printer.

13.1 Ticket base material

<table>
<thead>
<tr>
<th>Material</th>
<th>Paper, 100 % chemical pulp, no ground wood permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laminate (Triplex)</td>
<td></td>
</tr>
<tr>
<td>Plastic (PVC)</td>
<td></td>
</tr>
<tr>
<td>Stiffness</td>
<td>18—36 g/cm (in grain direction)</td>
</tr>
<tr>
<td>Thickness</td>
<td>Paper and laminate: 0.18—0.40 mm, 170—210 g/m²</td>
</tr>
<tr>
<td></td>
<td>Plastic (PVC): 0.18—0.25 mm</td>
</tr>
<tr>
<td></td>
<td>Factory setting: 0.18—0.25 mm (default)</td>
</tr>
<tr>
<td></td>
<td>0.26—0.32 mm (optional)</td>
</tr>
<tr>
<td></td>
<td>0.33—0.40 mm (optional)</td>
</tr>
<tr>
<td>Curl</td>
<td>Deviation from flatness &lt; 0.6 mm across the length, width, or diagonal of the ticket</td>
</tr>
</tbody>
</table>

13.2 Coating and preprint

| Thermal coating | Shall meet or exceed the ANSI 3.11 specification |
|                | Smoothness: Max. 75 Sheffield units             |
|                | Properties: Same as fax grade 3                 |
| Top coating    | The thermo-sensitive surface of the document stock can be provided with a protective UV or moisture proofing top coating. |
| Preprint       | Tickets can be preprinted on one or both sides. |
|                | Ink for thermo-sensitive side: Laser printer approved ink without whiteners |
|                | Ink for magnetic stripe side: Offset ink         |

**CAUTION!** – Never use abrasive inks as they reduce the life of the thermal print head.

Thermal print to preprint alignment

Tolerances in the printer, and in the ticket stock itself, can cause misalignment between the preprint of the ticket stock and the thermal print. The ticket guides in the printer are adjusted to 54.38 ± 0.05 mm. Narrower adjustment tolerances would cause

---

¹ 0.18-0.32 mm for Frontload 1 and Frontload 2 versions of the printer
paper jam when the relative humidity changes the ticket width. A ticket width of 53.98 ± 0.2 mm gives a maximum misalignment of 0.65 mm (54.38 + 0.05 – (53.98 – 0.2)).

**TIP!** – Avoid designing tickets that require close alignment between preprint and thermal print.

### 13.3 Magnetic media

- **Magnetic stripe**: Side stripe positioned according to ISO 7811/2
- **Center track** (option)
- **Magnetic media**: Full tape, transfer tape or slurry

**CAUTION!** – In case of slurry, care must be taken to avoid excess slurry material and abrasive particles that may cause unduly high degree of wear on the magnetic recording and read heads in the TTPM2

- **Coercivity**
  - Low: 300 Oersted
  - High: 2750 Oersted (option)
- Other non-standard coercivities available on request

If a ticket is perforated, for stub separation for example, the perforation shall not infringe on the magnetic track to prevent interference with magnetically encoded data.

### 13.4 Ticket dimensions and perforation

- **Stock format**: Gapped or non-gapped consecutive Fanfold form tickets.
  - Sheet-cut (single) tickets for manual or dispenser loading.
  - Roll tickets with black marks or punched holes as top of form indicators.
- **Perforation cut direction**: Perforation and cutting of ticket material must be done from the thermally sensitive side of the paper.
- **Document standard**: ISO No. 7810
- **Ticket width**: 53.98 ± 0.20 mm
- **Ticket length**: 85.6 ± 0.25 mm, or 110.0 ± 0.25 mm
- **Corner radius**: 3.15 ± 0.3 mm (preferably without minus tolerance). Used for optical detection of top-of form.
- **Perforation for stub**: Placed at the trailing end of the ticket
- **Gapped tickets**: Two tabs according to Figure 13.
- **Non gapped tickets**: Equal distance between tabs according to Figure 14.
Figure 13. Gapped tickets (for printers with cutter)
Grain direction
Transport direction

53.98 ±0.2

Magnetic stripe

0.6

L ±0.25 (see below)

0.04 max.

Figure 14. Non gapped tickets (for printers with burst separator)

Perforation not allowed within this 6 mm wide area

Transport direction

R 3.15 ±0.3

Stubs

Magnetic stripe

0.18 min.

0.4 max.

Thermal coating

Magnetic code must not cross optional perforation

6 mm

Figure 15. Both gapped and non-gapped tickets with center track can be used in printers ordered with center track option

L= 85.6 (standard as per ISO 7810)
L= 110.0 (customer special)
ORDERING INFORMATION

The modularity of TTPM2 makes it possible to create thousands of different versions of it. The TTPM2 Selection Guide (Publication No. 101193) describe the concept. Please refer to it and contact Swecoin, or a Swecoin representative for configuration help. If you need a configuration not already available, or any other modifications, don’t hesitate to contact us to see if the functions you need are possible to achieve.

<table>
<thead>
<tr>
<th>Magnetic stripe</th>
<th>Ticket type</th>
<th>Continuous feed</th>
<th>Handfed</th>
<th>Ordering No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracka 2&amp;3 75/210 bpi</td>
<td>Fanfold</td>
<td>1 rear</td>
<td>1 rear</td>
<td>02440-000 02440-001 02440-800</td>
</tr>
<tr>
<td>LoCo</td>
<td>Gapped</td>
<td>2 rear</td>
<td>-</td>
<td>02440-008 02440-018 02440-808</td>
</tr>
</tbody>
</table>

In addition to the ordering No’s above, you must also specify:
- Range for ticket thickness adjustment: 0.18—0.25 mm, 0.26—0.32 mm, or 0.33—0.40 mm
- Firmware version. If unspecified, the latest firmware version will be fitted.

<table>
<thead>
<tr>
<th>Ordering No.</th>
<th>Accessory description</th>
</tr>
</thead>
<tbody>
<tr>
<td>02293-000</td>
<td>Output tray (delivered as standard for desktop printers)</td>
</tr>
<tr>
<td>00729-000</td>
<td>Fanfold ticket paper input tray</td>
</tr>
<tr>
<td>01035-002</td>
<td>Power supply for OEM printer mechanism, 150 VA (preferred model)</td>
</tr>
<tr>
<td>10828-050</td>
<td>Power supply for OEM printer mechanism, 50 VA (obsolete, only replacement part)</td>
</tr>
<tr>
<td>10825-000</td>
<td>Serial RS232 cable, 1.5 m</td>
</tr>
<tr>
<td>102531</td>
<td>Rear control panel and ticket guide option</td>
</tr>
</tbody>
</table>

¹ The evaluation kit contains a desktop printer, all available manuals, a disk with utility programs, 50 sample tickets, and a serial cable.
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