METROLINX

Payments (PRESTO) Sigma Ticket Vending Machine (S-TVM) Standard

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Metrolinx,

an Agency of the Government of Ontario

Preface

This is the first edition of the *Payments (PRESTO) Sigma Ticket Vending Machine (S-TVM) Standard*. This standard replaces the previous internal document titled *Sigma TVM*.

This document is for use by designers, consultants and contractors involved with the planning, design and construction of projects that include these devices. It is intended for suitably qualified professionals that are familiar with the subject matter. This document is not a substitute for all applicable local codes, standards and manuals.

The *Payments (PRESTO) Sigma Ticket Vending Machine (S-TVM) Standard* was developed by the Operational Readiness Payments Office, Payments (PRESTO) Division, Metrolinx.

Suggestions for revision or improvements, including a description of the proposed change along with information on the background of the application and any other useful rationale or justification, can be sent to the Metrolinx Payments (PRESTO) Office, Attention: Director Operational Readiness Payments. The Director of Operational Readiness Payments ultimately authorizes the changes. Proposals for revisions or improvements to include your name, company affiliation (if applicable), email address, and phone number.

November 2024

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1. Scope

1.1 Overview

1.1.1 This standard sets out the requirements during planning, design, construction, and maintenance.

1.1.2 This PRESTO device is for purchasing paper tickets and adding value (funds) to a PRESTO card. This device accepts credit, debit cards, and cash. In other contexts, this device is referred to as Ticket Vending Machine (TVM) for GO Transit and UP Express.

1.2 Purpose

1.2.1 The key objective of this standard is to provide accurate details and specifications to plan the design and execution of TVM PRESTO device infrastructure by providing installation details, civil works requirements, and power and data specifications.

1.2.2 Compliance with this standard during planning, design, construction, and maintenance will ensure that Work performed aligns with the holistic approach for Payments (PRESTO) elsewhere in the network.

1.2.3 The Contracted Party shall perform all Work in accordance with the requirements of this standard and shall support the Metrolinx commitment to always take safety seriously.

2. Definitions, Abbreviations, Interpretation, Codes, and Standards

2.1 Definitions

2.1.1 Capitalized terms used in this standard shall have the meanings prescribed in Table 1.

Table 1: Definitions

Term	Definition
"Contracted Party"	Means the party responsible for the performance of the Work of the project assignment and under contract or agreement with Metrolinx (e.g. Consultant, Contractor, Designer, Design-Builder, Project Co, Technical Advisor, or Developer).

Term	Definition
	Within this standard, wherever the term Contracted Party is used, but there is no Contracted Party, the same item shall apply directly to Metrolinx.
GO Station	Means any GO Transit station.
Metrolinx	Means Metrolinx, a non-share capital corporation continued under the *Metrolinx Act,* S.O. 2006, c.16 and a Crown Agency in accordance with the *Crown Agency Act,* R.S.O. 1990, c.48 and includes all operating divisions.
Metrolinx Standards	Means standards developed by Metrolinx as defined in Section 2.4.1.
PRESTO	Means Metrolinx's Regional Fare Card System
Transit Safety	Means the division within Metrolinx that is accountable for the enforcement of the Trespass to Property Act.
Work	Means the design, construction, maintenance, installation, testing, commissioning, and completion of the scope of the project assignment.

2.2 Abbreviations

2.2.1 The abbreviations used in this standard shall have the meaning prescribed in Table 2.

Table 2: Abbreviations

Abbreviation	Definition
ANSI	American National Standards Institute
AWG	American Wire Gauge
CMR	Communications Multipurpose Cable, Riser
I&IT	Innovation & Information Technology
ITFS	Information Technology Field Services
LAN	Local Area Network
N/A	Not Applicable

Abbreviation	Definition
NEMA Box	National Electrical Manufacturer Association Box
S-TVM	Sigma Ticket Vending Machine
TIA	Telecommunications Industry Association
U/UTP	Unshielded Twisted Pair
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus

2.3 Interpretation

2.3.1 This standard shall be interpreted according to the following provisions, unless the context requires a different meaning:

a) Unless the context specifically states otherwise, all obligations included herein are the responsibility of the Contracted Party to undertake.

2.4 Codes and Standards

2.4.1 All systems, equipment and materials required for Work relating to this standard, shall be provided in accordance with the most current edition of applicable federal, provincial, municipal, and industry codes, standards, and guidelines, including:

a) Metrolinx/GO Transit standards and guidelines (the "Metrolinx Standards"), including all latest version documents on the GO Site, including amendments and bulletins (http://www.gosite.ca/engineering_public/);

b) National Building Code of Canada (NRCC 51690), latest version;

c) Ontario Provincial Standard Specifications (OPSS), latest version;

d) Ontario Provincial Standard Drawings (OPSD), latest version;

e) Canadian General Standards Board (CGSB), latest version;

f) Canadian Standards Association (CSA), latest version;

g) American National Standards Institute (ANSI), latest version; and

h) Telecommunications Industry Association (TIA), latest version.

3. Installation Parameters

3.1 Dimensions, Weight, and Clearances

3.1.1 The Table 3 below shows the S-TVM dimensional and weight parameters.

Table 3: Dimensions and Weight

	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
S-TVM Housing without CAP/Canopy	**2135**	**900**	**570**	**~430**
S-TVM Housing with CAP/Canopy	**2345**	**1200**	**1400**	**~430**

Figure 1: S-TVM Dimensions without CAP/Canopy

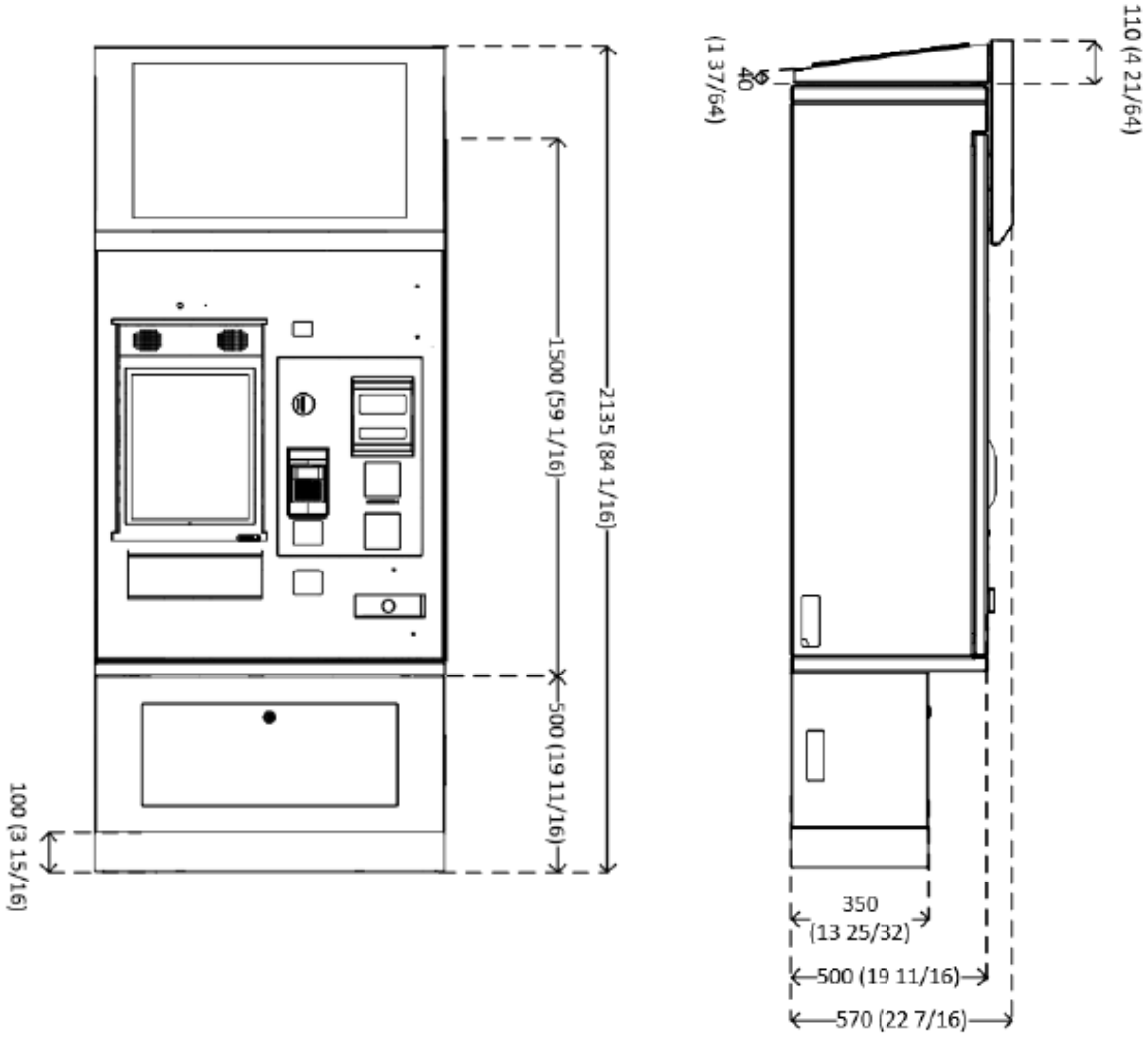
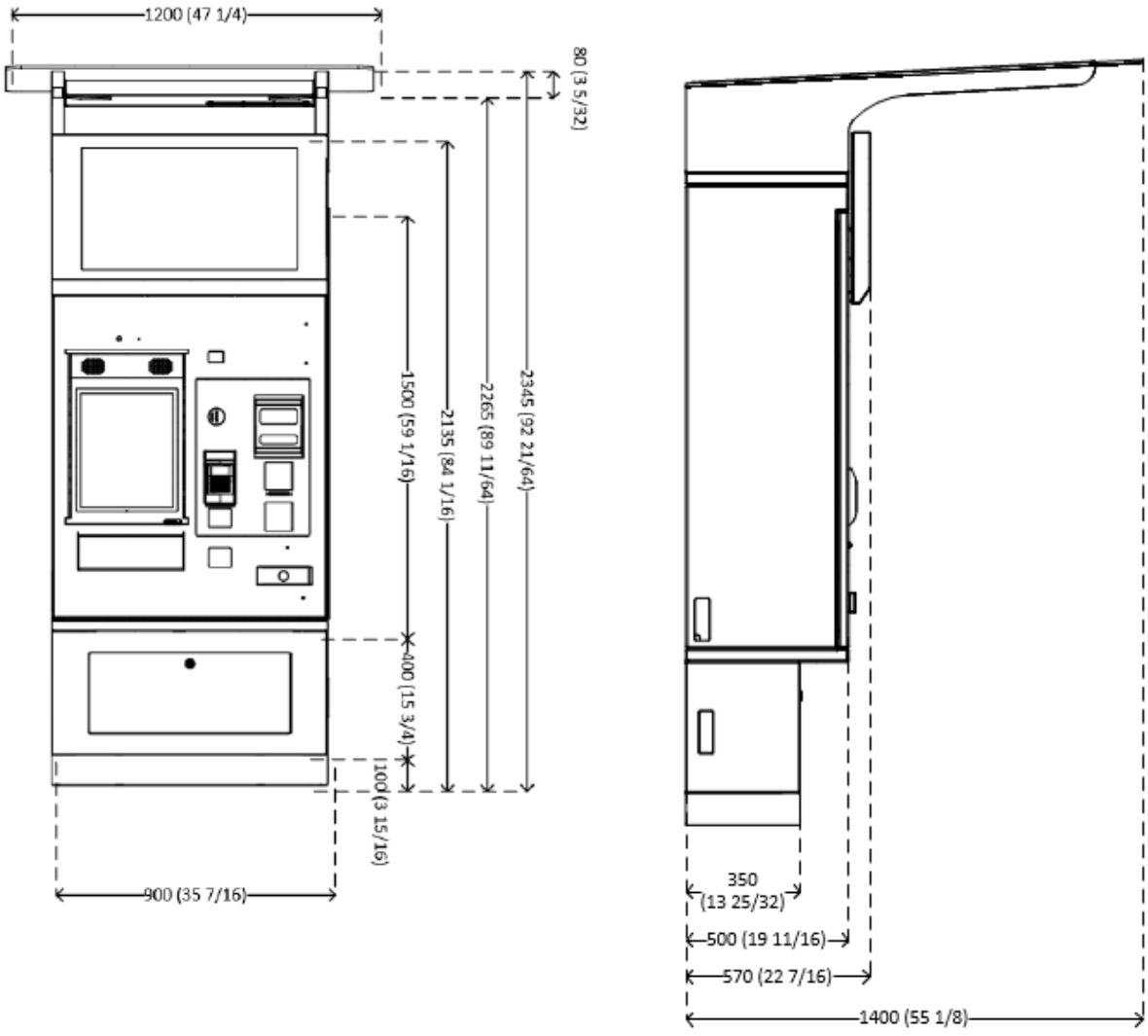


Figure 2: S-TVM Dimensions with CAP/Canopy



3.1.2 S-TVM Clearance Requirements

Table 4: Clearances

	Height (mm)	Width (mm)	Depth (mm)
S-TVM Housing without CAP/Canopy	2250	1100	670
S-TVM Housing with CAP/Canopy	2450	1200	1400

3.2 S-TVM Infrastructure Requirements

3.2.1 For GO Transit and UP Express sites, infrastructure requirements for the S-TVM are as follows.

3.2.1.1 **Power and Data Conduits**

a) The S-TVM is designed to accept power and data conduits either through the device base or through the device back.

3.2.1.2 **Mounting Surface**

a) The S-TVM shall be installed on a solid surface;

b) The ground shall be level and horizontal to allow the system to be affixed correctly;

c) The maximum flatness defect of the floor between the highest point and the lowest point shall not exceed 1%; and

d) The recommended is a concrete surface, flushed to the top of the adjacent surface where the customers will be standing or locating the mobility devices while using the TVM, (Cement C20/25).

See Figure 3 & 4 for details.

3.2.1.3 **Power Requirements**

a) The S-TVM requires the following power specifications: 100V AC/30A breaker. For existing installation a 100V AC/30A breaker is acceptable.

1) Two (2) meters of slack shall be provided within the device;

2) Recommended power supply cable shall be a 12 AWG (max 8 AWG) wire gauge at the terminal block;

3) Wire gauge transitions shall not occur within the device. Transition of the wire gauge will need to occur at the closest junction box to the device, not in the device;

4) Provide Dedicated Neutral per device/circuit, (not shared);

5) Provide Dedicated Ground per device/circuit, (not shared); and

6) Conduit size to be determined by Civil Works Contractor.

3.2.1.4 **Data Requirements**

a) The S-TVM requires 2x CAT 6 cables with the following specifications:

1) CAT 6 cables run between demarcation and device/equipment shall not exceed 90 m (300 ft) (within conduit run, not including service coil);

2) The cable shall be dedicated and not shared;

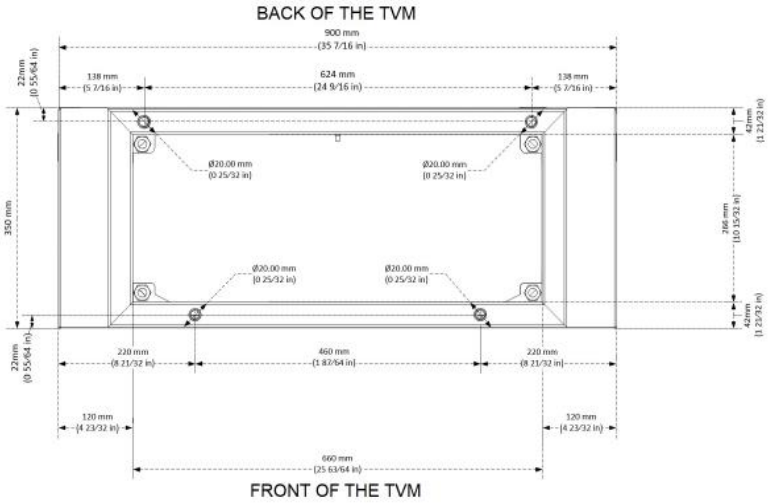
3) RJ45 connector type shall be provided, per Metrolinx I&IT standards; and

4) Cat 6 data cable type shall be provided, per Metrolinx I&IT standards.

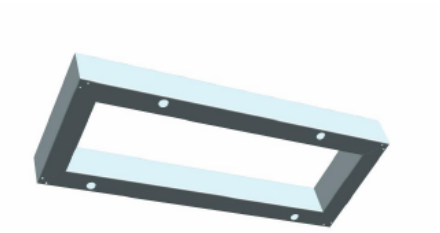
Note: *Current Metrolinx I&IT standards supersede all wiring requirements stated within this document. Refer to the latest Metrolinx I&IT standards.*

Figure 3: S-TVM Footprint and Base Opening Measurements

4.1.1 Main Pedestal



4.1.2 Additional Pedestal



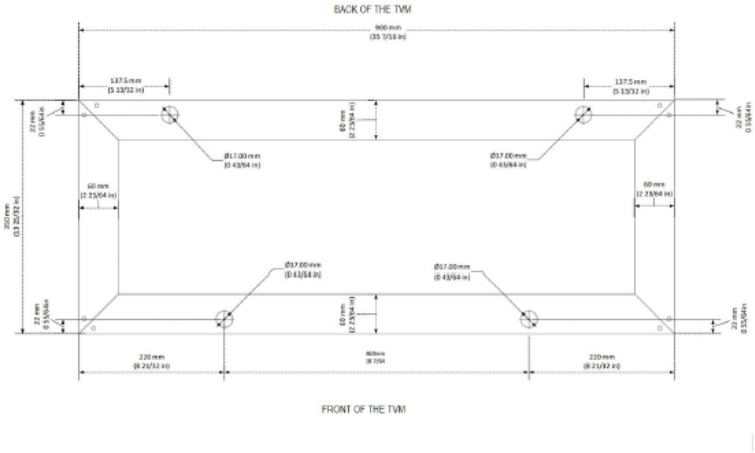


Figure 4: S-TVM Footprint and Base Opening Measurements Details

7.1 Pedestal fixing

In the figures below are shown the holes on the pedestal.

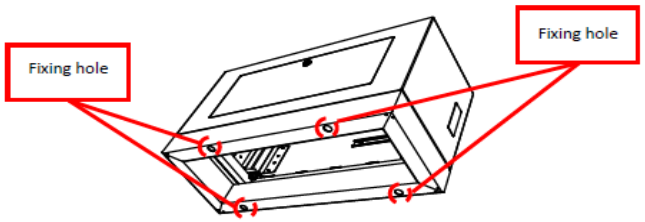


Fig. 44

To fix the pedestal on the floor use anchors according to specifications provided in the appropriate paragraph (see 6.1 anchor fixing types)

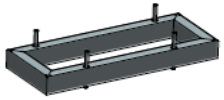


Fig. 45

Cables can also entry from below the pedestal.

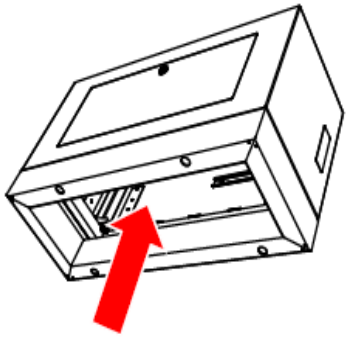


Fig. 72

3.3 Fully Installed S-TVM

3.3.1 The fully installed S-TVM is shown in the Figure below.

Figure 5: Fully Installed S-TVM

3.4 GO S-TVM Requirements

Table 5: GO S-TVM Requirements

Demarcation to Device	Requirements
Description	PRESTO vending machine is for sales of PRESTO cards, PRESTO tickets, and e-purse loads. Power and data connections shall meet or exceed Metrolinx I&IT / ITFS Standards. Consult the following documents: 1. The latest version of the *Innovation & Information Technology Telecommunication and Systems Standard* for details; and 2. *Electrical Identification and Nomenclature Specification*.
Wire Run for Power	Pull power wires through completed power conduits from the power panel to the Ticket Vending Machine (afterset). The wires shall be pulled in power conduits from UPS backed-up power panels in the communications rooms or mini-hub rooms.
Power Wires Requirement (rating)	1840 watts max. 1. Dedicated 100V AC / 30A single pole breaker/circuit; 2. For existing installation 100V AC / 30A Breaker is acceptable. The recommended gauge for the TVM device is 12 AWG (max 8 AWG) at the terminal block. Wire gauge transitions shall not occur within the device. Transition of the wire gauge shall occur at the closest junction box to the device, not in the device. Provide a dedicated neutral per device/circuit, not shared. Provide a dedicated ground per device/circuit, not shared.
Termination of Power Wires	Marretted ends; Protect all terminations from exposure, protected with an enclosure if necessary. For safety and security: 1. Label Power Distribution Panels ~6 inches from both wire ends; Labeling (Denote "S-TVM 1" for PRESTO S-TVM 1) 2. Wires shall be protected with an enclosure if necessary.
Cables Run for Comms	Pull comms cables (two cables per device) through conduit, from demarcation to device/equipment end.

	Cat 6 between demarcation and device/equipment shall not exceed 90m (300 feet) (within conduit run); cabling shall be dedicated and not shared. Two CAT 6 cable runs per device (One for the main PRESTO connection / One spare for future development) ***Note:*** *Current Metrolinx I&IT standards supersede all cabling requirements stated within this document. Refer to the latest Metrolinx I&IT standards.*
UPS	S-TVM devices are not equipped with an internal UPS. The internal backup battery shall only allow devices to close current transaction and perform a scheduled shutdown. All S-TVM devices shall be connected to UPS-backed power panels in communication rooms. Consult the latest version of the *Innovation & Information Technology (I&IT) Telecommunication and Systems Standard* for details.
Comms Cable (CAT 6)	CMR Category 6 U/UTP, four twisted pair 22-24 AWG. All communication cables shall comply with ANSI/TIA-568-B.2 comms connectivity with ends terminated. Protect all terminations from exposure, covered with an enclosure if necessary. Mini-hub rooms shall be used to span beyond the 90 m limitations of the CAT 6. Power and data connections shall meet or exceed Metrolinx I&IT / ITFS Standards. Consult the latest version of the Innovation & Information Technology (I&IT) Telecommunication and Systems Standard for details. Refer to Section 7.4.3, Metrolinx Innovation & Information (I&IT) Telecommunication and Systems Standards.
Termination of Comms Cables	CAT 6 termination type at device end: Male RJ45 Rev-connects or equivalent. CAT 6 termination type at patch panel: Female RJ45 Keystone punched down.
Wireless Solution	If a LAN connection is unavailable, S-TVM can be equipped with a wireless cellular (LTE) router. Consult with ITFS and the PRESTO team when planning for installation at such locations.
Service Coil	Power: 2-3 m (7-9 ft)

	Comms: 2-3 m (7-9 ft)
Readiness: Comms Cable (Cable Integrity/Continuity)	Fluke metre report or equivalent to validate comms continuity. Test results shall be provided to Metrolinx I&IT for review.
Data Cable Labeling	For safety and security: 1. Label network patch panels ~6 inches from both cable ends; Labeling (Denote "S-TVM1" for PRESTO Vending 1 and "S-TVM SPARE" for secondary PRESTO data cable) 2. Cables shall be protected with a protective enclosure if necessary. Post-installation data cables shall be updated with device identification (ID) at the device level and in the patch panel.

4. Handover and Commissioning

4.1 Handover and Commissioning

4.1.1 The final handover of all new assets to Metrolinx shall follow the Rail Corridor Asset Handover Protocol.

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