MSI Concealed Weapon Detection and Touchless Gun Screening System User Manual

Concealed Weapons Detection
Installation Requirements
User Manual

Contents

Introduction

This document describes the physical, power, flooring, lighting, and other pertinent guidelines required to support the installation of a Concealed Weapons Detection (CWD) system. It also defines procedures for bolting the CWD (Model P1) to a floor or outdoor surface.
The Concealed Weapons Detection system is the integration of the Evolv Express system and the Motorola Solutions ACC system.
Evolv Express is a walk-through personnel screener designed to detect mass casualty producing metallic based threats including firearms and IEDs. Evolv Express comes in both dual- and single-lane configurations. The single-lane configuration will have the transmitter tower installed on the right or left, depending on the needs of the site.

Components

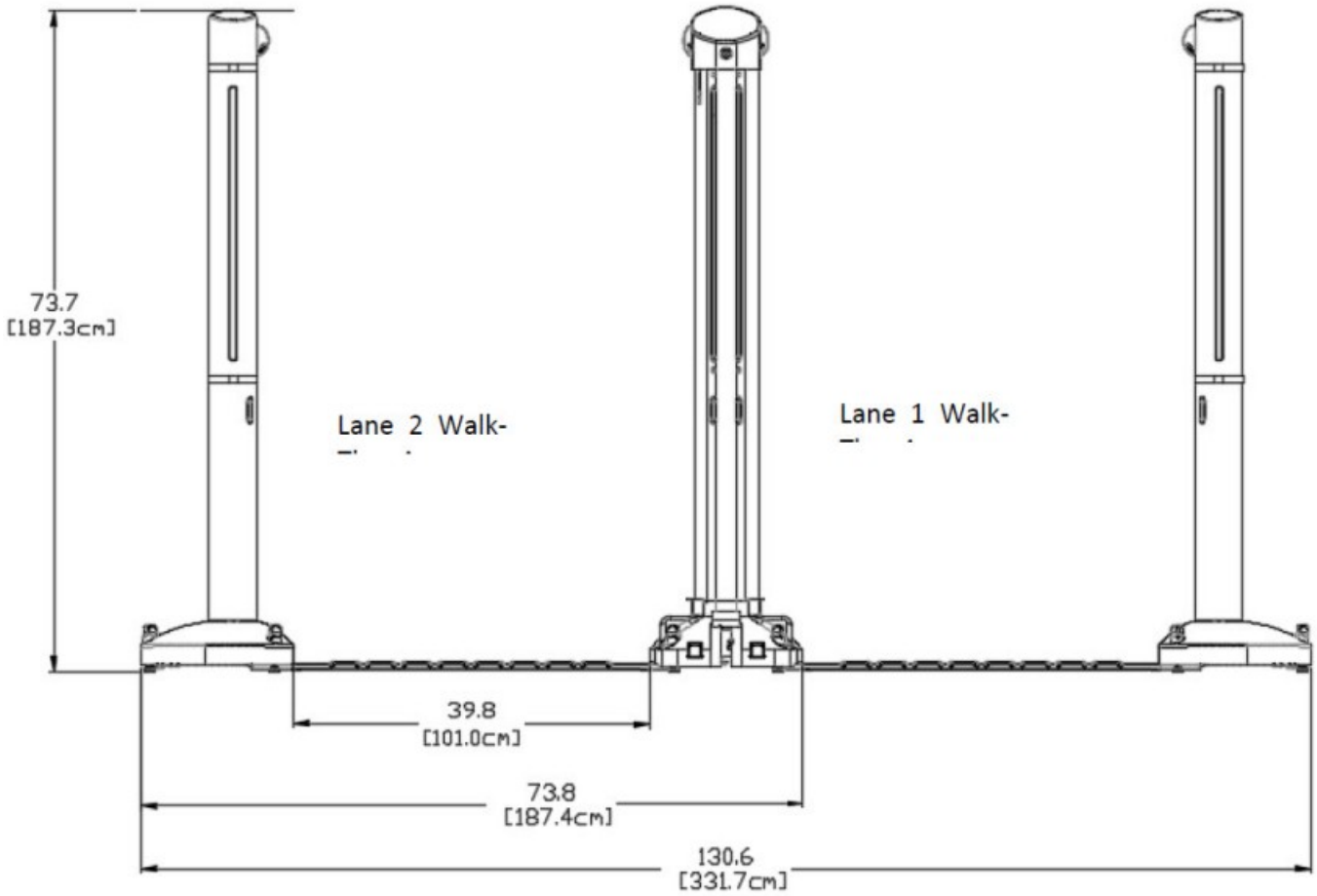
The CWD system consists of both standard and optional components. The figure below lists the components of and depicts a typical dual-lane configuration.

Item	Description	Qty	Notes
1	Transmitter (TX) Tower	1	All tablet, power, and external connections at base of TX, either directly or through mat
2	Receiver (RX) Tower	2	Only 1 RX, left or right, for single-lane configuration
3	Floor mats with cables	2	Only 1 mat, left or right, with cables for single-lane configuration
4	Flow Control tablets on floor stands	2	See NOTICE below
5	Alarm Resolution tablets on tabletop stands	2	Not shown, see NOTICE below
6	15 ft. power cable	1	Not shown, see NOTICE below
7	20 ft. CAT6 Ethernet (PoE)	4	Not shown
8	Universal installation kit	1	Not shown

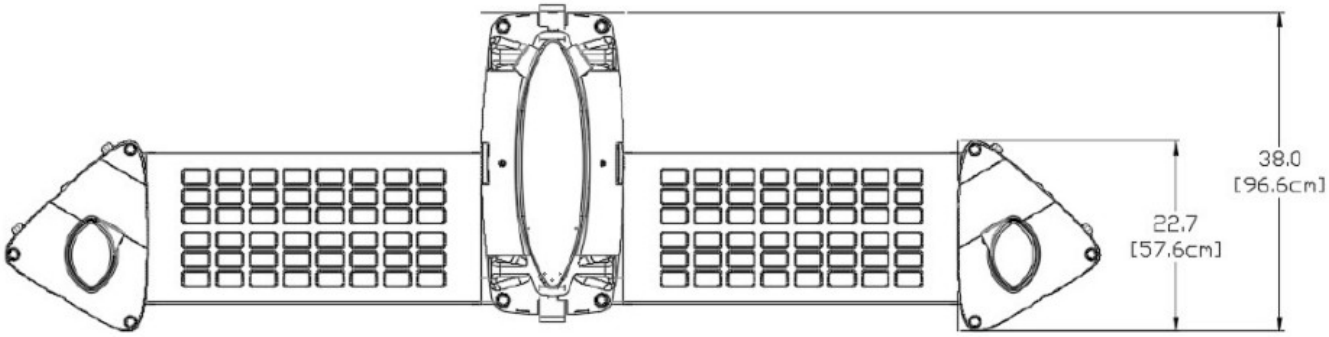
NOTICE: The standard dual-lane configuration consists of four tablets – two Flow Control and two Alarm Resolution. You can purchase up to a total of six additional tablets. The standard single-lane configuration consists of two tablets – one Flow Control and one Alarm Resolution.

Specifications

Physical Specifications
Dimensions
Front View



Top View



Depth	38.0 in. (96.6 cm)
Width	130.6 in. (331.7 cm)
Height	73.7 in. (187.3 cm)
Height (mat)	0.9 in. (2.3 cm) at top, 0.2 in. (0.5 cm) at front lip
Opening (lane width)	39.8 in. (101.0 cm) at base, 48.0 in. (121.9 cm) above base

Weights

CWD supports both standard and optional components and accessories. Some of the optional accessories are used to test or set up the system and are not part of the installation.

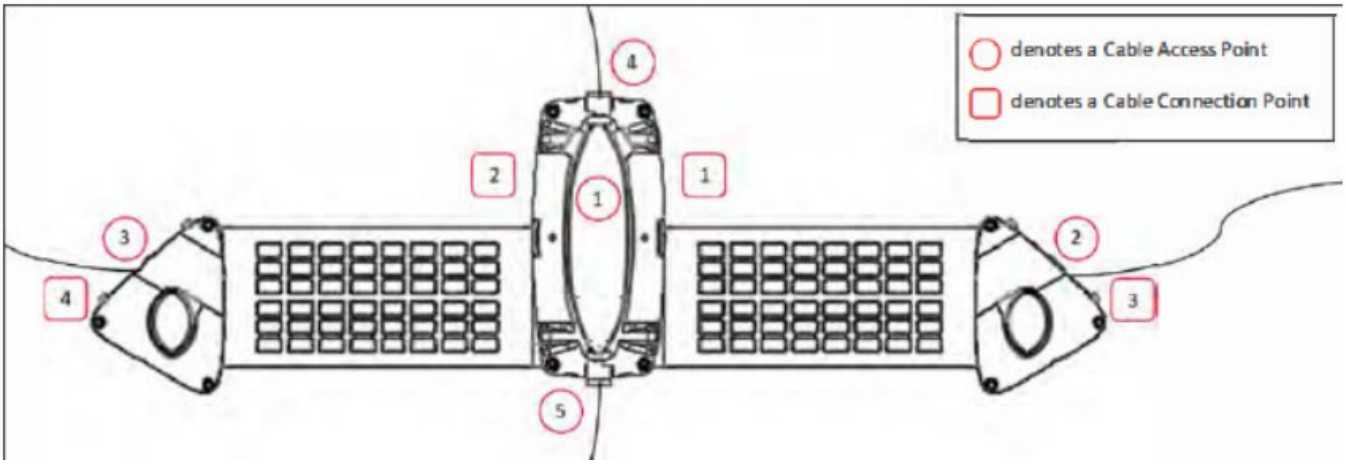
Standard Components	Weight
Transmitter (TX) Tower	210 lbs. (95.3 kg)
Receiver (RX) Tower (2)	122 lbs. (55.3 kg) / 61 lbs. (27.7 kg) each
Mat and Cables (2)	20 lbs. (9.1 kg) / 10 lbs. (4.5 kg) each
Tablet & Floor Stand (2)	57 lbs. (25.9 kg) / 28.5 lbs. (12.9 kg) each
Tablet & Desktop Stand (2)	13 lbs. (5.9 kg) / 6.5 lbs. (2.9 kg) each
System Total	422.5 lbs. (191.6 kg)

Optional Components	Weight
Tablet & Floor Stand	28.5 lbs. (12.9 kg)
Tablet & Desktop Stand	6.5 lbs. (2.9 kg)

Disposable Shipping Crates
CWD comes in disposable packaging, all materials are recyclable.

Crate	Length	Width	Height	Weight
Single-lane crate	47.25 in. (120 cm)	46 in. (117 cm)	82 in. (208 cm)	400 lbs. (181.4 kg)
Dual-lane crate no. 1	47.25 in. (120 cm)	46 in. (117 cm)	82 in. (208 cm)	492 lbs. (223.2 kg)
Dual-lane crate no. 2	48 in. (122 cm)	48 in. (122 cm)	82 in. (208 cm)	200 lbs. (90.7 kg)

Accessibility
CWD complies with Americans with Disabilities Act (ADA) requirements for wheelchair access.
Cables, Access Points, and Connection Points
CWD comes standard with a detachable 15 ft. power cord (shipped with the CWD system) is supplied for connecting the TX Tower to the power outlet. One end of the power cord supports an IEC 320 (S15 Variant) connector while the other end supports local AC power plug requirements. CWD also comes standard with one 20 ft. CAT6 Ethernet cable per tablet.
An “Access Point” is the location where a cable can enter the system. There are up to five optional Cable Access Points defined by the diagram and detailed in the table below. Two of the Cable Access Points are under the provided mats. Each mat provides channels for inserting and securing cables under the mat.
A “Connection Point” is the location where a cable can attach to the system. There are several Cable Connection Points defined by the diagram and detailed in the table below.



Cable Access Point options (indicated by ○ in the image above)

1. Under TX Tower (completely hidden)
2. Under Lane 1 Mat (in channel)
3. Under Lane 2 Mat (in channel)
4. From back of TX Tower (optional, can use front)
5. From front of TX Tower (optional, can use back)

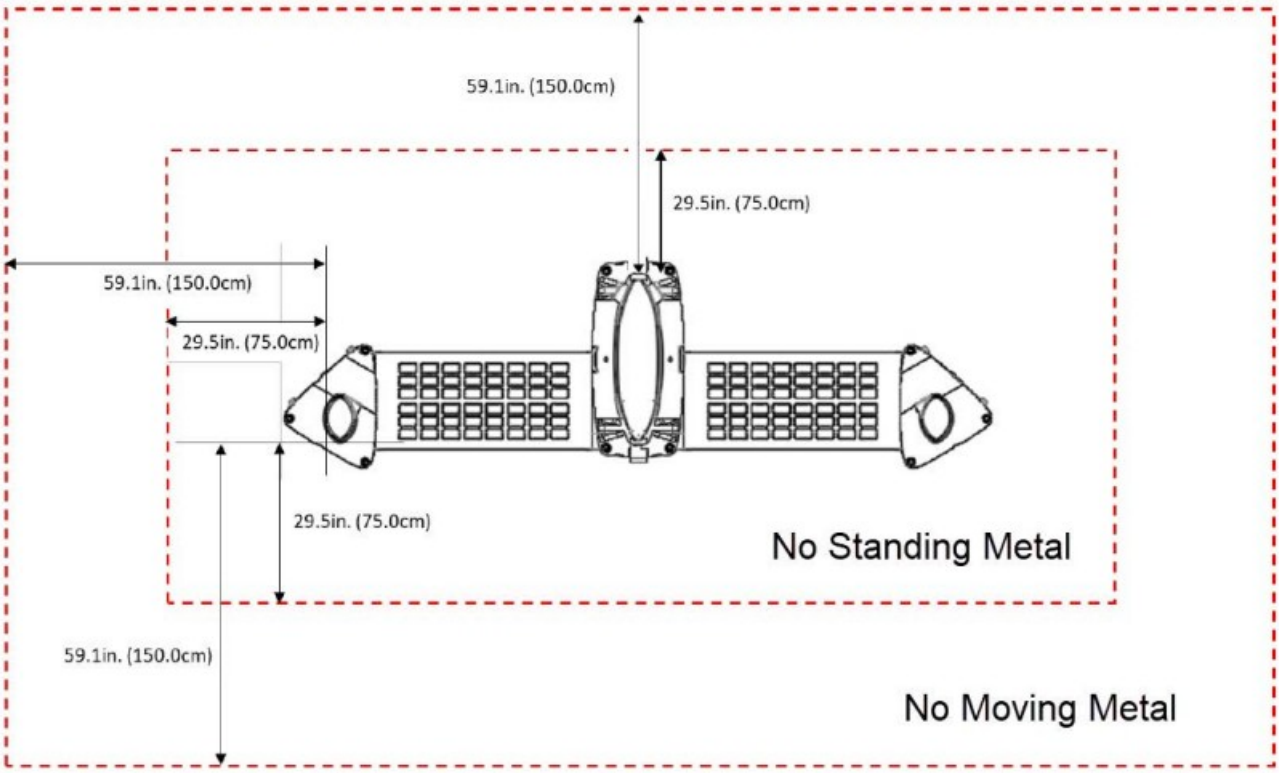
Cable Connection Point options (indicated by ▢ in the image above)

1. TX Tower, base Lane 1 side (under access door)
   a. Power inlet (1x)
   b. Tablet RJ45 (2x)
2. TX Tower, base Lane 2 side (under access door)
   a. Tablet RJ45 (4x)
   b. F/R Situational Awareness Camera RJ45 (1x)
   c. External Network RJ45 (1x)
3. Lane 1 Mat RJ45 (1x, typically for Tablet)
4. Lane 2 Mat RJ45 (1x, typically for Tablet)

Exclusion Zones
CWD hardware has two exclusion zones around the system.

- The first exclusion zone of 59.1 in. (150.0 cm) should be kept clear of large moving metal objects (for example: doors, mobility assist devices, escalators, etc.).
- The second exclusion zone of 29.5 in. (75.0 cm) should be kept clear of large metallic objects (for example: bike racks, fencing, stanchions, barrels, etc.).

The exclusion zones are measured from the outer surfaces of the TX and RX towers. These exclusion zones are intended as minimum guidelines; additional spacing might be required.
Note: Do not install the CWD hardware on floating or elevated floors that can introduce movement and vibration.



Operational Footprint

Concealed Weapons Detection screens visitors as they walk through the lanes of the unit. It is important that the visitors walk straight through and not pause. Stanchions can be used to guide visitors through the lanes. Consideration should be given to the flow of visitors into and out of the CWD.

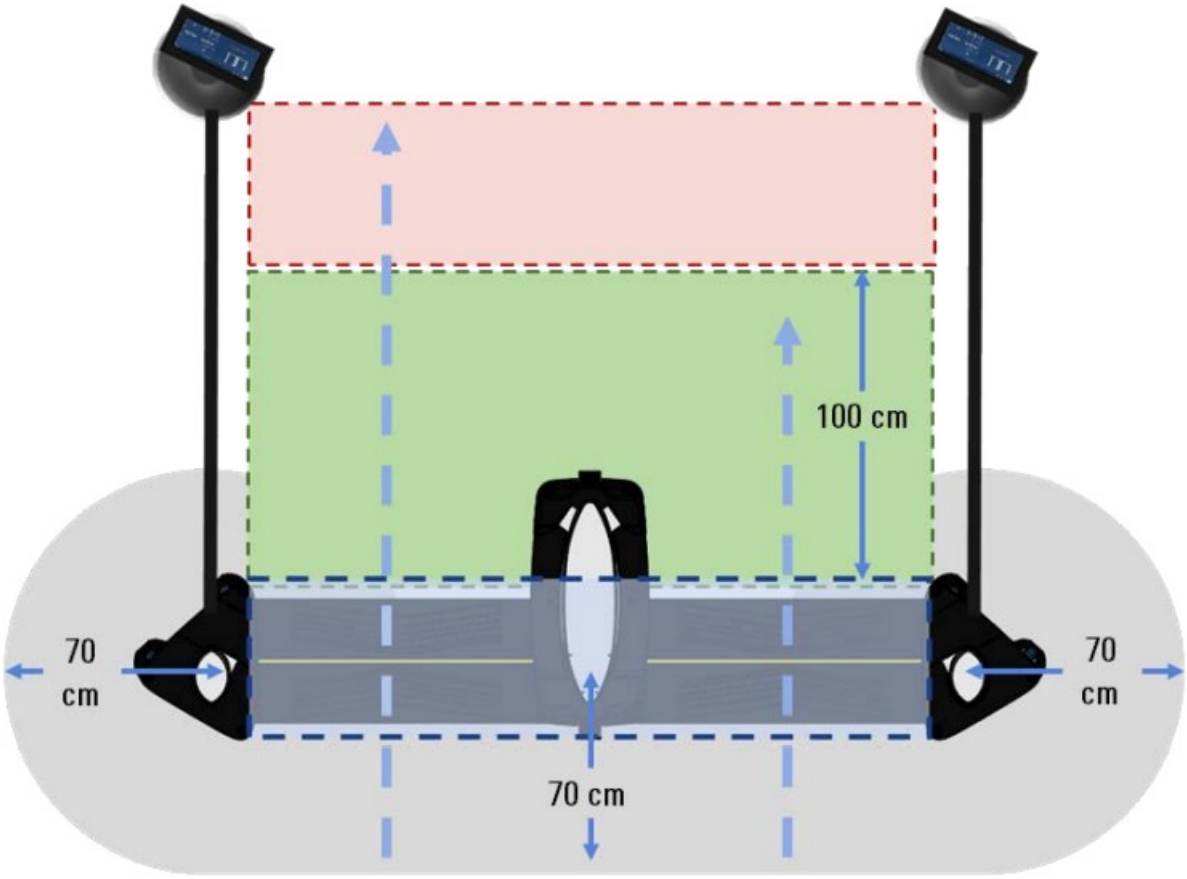
CWD systems support both Flow Control and Alarm Resolution tablets, typically one each per lane. Flow Control tablets are typically located to the rear 11.5 to 14.8 ft. (350.0 to 450.0 cm) from the back edge of the mat. Alarm Resolution tablets are typically located on a small table off to the side of each lane. Each Alarm Resolution station (table and tablet) typically requires 3.0 ft. x 4.0 ft. (91.4 cm x 121.9 cm) of space.

All tables are provided by others.

A 20 ft. CAT6 cable is provided with each additional tablet. All other Ethernet cables are provided by others.

The following is the operational footprint for the CWD system and describes the approximate scan zone, decisions zone, and recommended resolution zone. The exclusion zone is an area that should be free of people and moving objects, such as swinging doors.

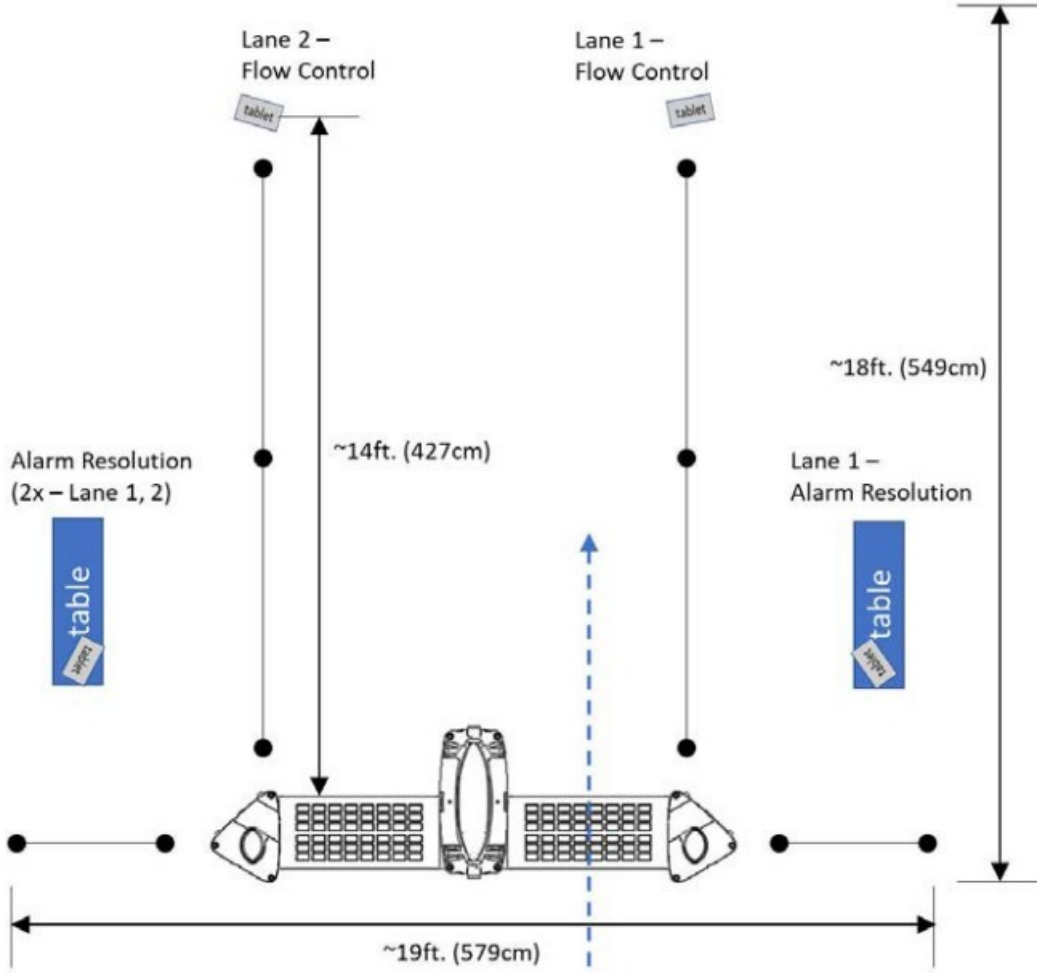
Key	Zone	Description
	Scan Zone – 58 cm (23 in)	Optimal operation is achieved if visitors walk through this zone in a straight line at a constant speed.
	Decision Zone – 10 0 cm (40 in)	A decision is provided 0.5 seconds after the visitor exits the Scan Zone.
	Exclusion Zone – 5 0 cm (20 in)	This is the area surrounding the Receiver Towers. Keep this area free of movin g objects, except those being scanned.
	Resolution Zone	Additional tablets might be necessary to maintain flow in high throughput applic ations.



Express Dual-lane Operational Area (Typical)

The operational area of the Evolv Express is very configurable, enabling flexible installations. Below is a typical dual-lane installation.

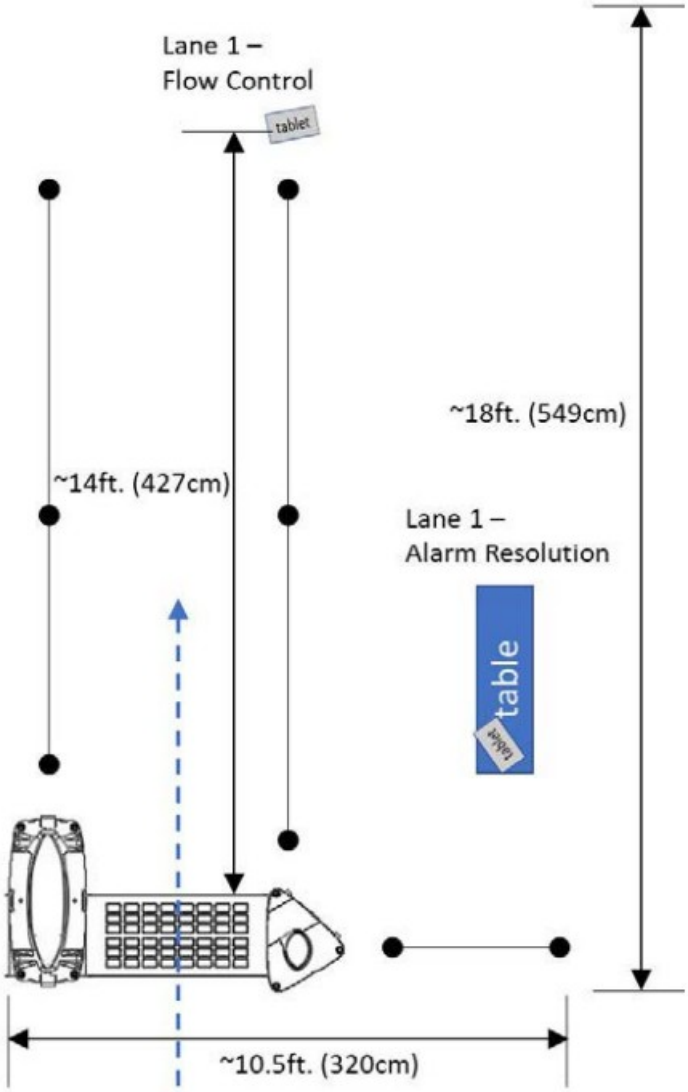
The Flow Control tablets can be located off of the TX Tower (center of the area) and the Alarm Resolution stations can be located as needed, to accommodate the physical space. The width of a dual-lane installation can be as small as the width of the dual-lane Express, 10.9 ft. (331.7 cm).



Single-Lane Operational Area (Typical)

The operational area of the CWD is very configurable, enabling flexible installations. Below is a typical single-lane installation.

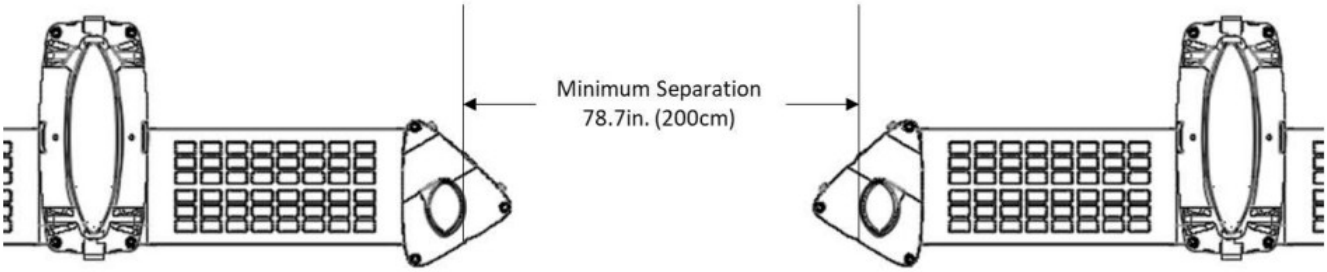
The Flow Control tablets can be located off of the TX Tower (center of the area) and the Alarm Resolution stations can be located as needed, to accommodate the physical space. The width of a single-lane installation can be as small as the width of the single-lane CWD, 6.2 ft. (187.5 cm).



Multiple Systems – Minimum Separation

Multiple CWD systems must be separated by at least 78.7 in. (200.0 cm).

Increase the separation between systems to handle large volumes of visitors, or to accommodate Alarm Resolution stations.



Power Specifications

System Power

The CWD power requirements are:

- Voltage: 115-230 VAC +/-10%
- Phase: single Phase
- Circuit (minimum): 5 Amps
- Consumption (typical): 170 W-200 W

The CWD comes with a standard IEC 320 (S15 Variant) inlet socket for the power connection. A detachable 15 ft. power cord (shipped with the CWD) is supplied for connecting the TX Tower to the power outlet. One end of the power cord supports an IEC 320 (S15 Variant) connector while the other end supports local AC power plug requirements.

Approximately 9 feet of the power cord will be exposed when run under a Lane 1 or Lane 2 mat.
All other power sockets, plugs, or cords are provided by others.

Tablet Power

CWD provides (6) RJ45 ports on the base of TX Tower. Each RJ45 provides communication and power via Power over Ethernet (PoE) to one Tablet. The RJ45 ports are redundant; only one port per tablet is required.
All other Ethernet cables and accessories are provided by others.
Front and Rear (F/R) Situational Awareness Cameras
CWD provides front and rear situational awareness cameras that can be connected, configured, and controlled by an external video management system (VMS). These cameras can be accessed via an independent RJ45 port labeled “FR CAM” on the base of the TX Tower. These cameras are separate from the Alarm Resolution camera(s). They are operated by an independent camera hub in the system that is only accessible via that port.
These cameras are Micro Bullet Imager Modules from the Avigilon H5A Modular Camera Line.
More information can be downloaded from Avigilon at: **https://www.avigilon.com/products/camerassensors/h5a-modular**.
Additionally,
you can view the output and configure these cameras with the Motorola Solutions Camera Configuration Tool (CCT). Download CCT at: **https://www.avigilon.com/products/camerassensors/camera**.

Specifications for Surfaces

The CWD system requires a stable and level surface to support proper operation and screening.
Cement, wood, tile, rubber, and carpeted surfaces are all acceptable; however, they must be stable with limited vibration.
The CWD can be deployed on any surface that is ADA compliant. Every effort should be made to install all three CWD towers as plumb as possible. The maximum angle of any RX or TX Tower, as measured by its largest outer surface, is 5 degrees.
Outdoor installations must be secured to a stable surface, per the “Floor Mounting an Express System (P1)” procedure.

Lighting Specifications

The CWD requires sufficient ambient lighting for capturing clear digital images of visitors walking through the system. The CWD can operate in most settings, whether there is direct natural light or artificial light; however, some very low lighting conditions may require additional lighting. If lighting needs to be added in proximity to or above the system for better visibility, use LED lighting.

Lighting Level	Typical Source	LUX	Notes
Very bright	Direct, natural light	Above -4,500	Might need to reduce LUX through shadin g
Bright	Mix of indirect, natural light	-800 to -4,500	Might need to reduce LUX through shadin g
Normal	Sufficient artificial light	-100 to -800	Determine the best setting on site
Low	Dim to relatively low artificial lig ht	-15 to -100	Might need to add artificial light
Very low	Very dim artificial light	-0 to -15	Likely need to add artificial light

Environmental Specifications

- Ingress Protection—Evolv Express supports Standard (indoor) and Outdoor rated Ingress Protection.
  – Standard IP54
  – Outdoor IP56—Power and data connectors are IP67, resisting water ingress up to 6in. (15cm)
- Operating Temperature—Range of -20 to +55°C (-4 to 131°F)
- Storage Temperature—Range of -40 to +70°C (-40 to 158°F)
- Relative Humidity—Range of 0 to 95% (Standard system – non-condensing, Outdoor system – condensing)
- Wind—mitigate the effects of wind using the following precautions:

– To reduce the risk of tipping over during wind the Evolv Express towers must be secured to the ground using bolts. If wind or wind gusts exceed 35 MPH the Evolv Express must be removed and stored in a location protected from the wind.

– To minimize the effects of wind during operation walls or wind barriers should be installed. If CWD cannot be protected from winds of 15 MPH or more alternative screening procedures may be required. This applies even if the system is secured to the ground.

See the current version of the Concealed Weapons Detection Specification Sheet for the latest environmental specifications.

Securing the CWD System to the Floor

The CWD system must be bolted (secured) to the floor or surface for installations where the TX or RX towers are at risk for tipping or falling due to visitor traffic and/or weather.
This procedure is intended to serve as a general guideline. Variants might be required due to considerations including: different types of floors or surfaces, slopes, and whether mats are used.
The drilling and installation of anchors in this section are to be performed by others/site representatives.
Securing the CWD system to the floor is to be directed by an Motorola Solutions representative.
Note: Do not change the scanner location if ACC alarms have been created for this scanner without coordinating with the ACC System administrator. After the location settings have been defined, they should not be redefined (for example when relocating a scanner) without consulting the ACC administrator because the corresponding alarm names must also be changed.

Tools and Materials

Ensure the items below were included in your Outdoor Bolt-Down kit bag that was included with the CWD system.

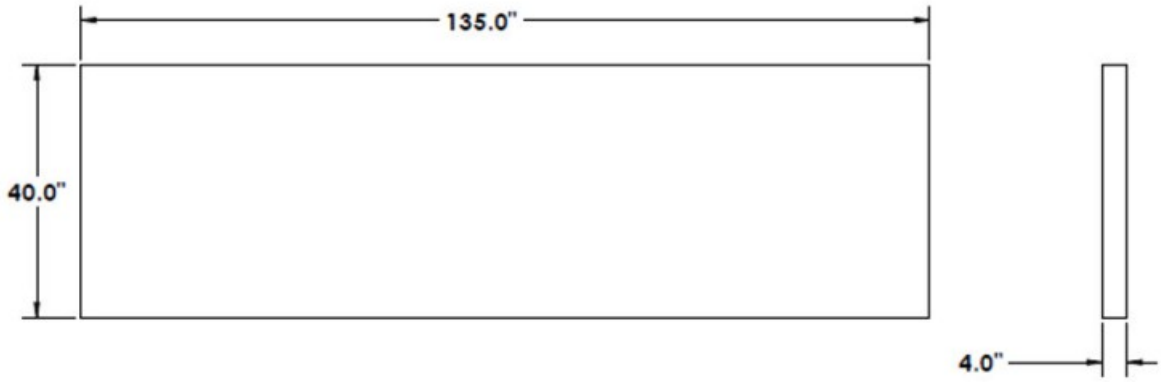
Part No.	Part No.	Qty
210-00406	210-00406	6
210-00407	210-00407	6
210-00408	210-00408	2
210-00409	210-00409	4
210-00410	210-00410	6
290-00307	290-00307	1

Other materials required for outdoor installation of the Express system are:

- Power drill (corded power drill is recommended)
- 1/2 in. Concrete drill bit
- 9/16 in. Deep socket and ratchet
- Hammer

Concrete Pad Specifications

MSI recommends pouring a concrete pad with the dimensions illustrated below before installing concrete anchors. The concrete used should have with a minimum compressive strength of 4000 psi. The top surface of the concrete slab should be as flush with the surrounding surface as possible.



Anchoring the CWD System

1. Mark the locations for the threaded anchors by one of the following methods:
   l Using the dimensions in the image in the section titled Securing the CWD System to the Floor, mark the locations for the threaded anchors in the concrete.
   l Set up the CWD system in its desired location, and mark the locations for the threaded anchors on the surface by sticking a punch or permanent marker through the holes in the base plates.
2. Using the ½" concrete drill bit, create a ½" bore to a minimum depth of 1-9/16" (1.5625").
3. Clean out the hole of any debris.
4. Using the provided anchor tool, drop the anchors into the ½" bore and hammer the anchors down until the shoulder of the anchor tool is flush with the top of the anchor. Alternatively, you can use this video link as guidance **https://www.youtube.com/watch?v=t6eENSixo94**.
5. Move the CWD system to the desired location, check that the anchors line up with the pre-drilled holes in the base plates.
6. Every foot on each tower must be in its correct position.
   The bottom of the base plate on each tower should be roughly 1.5" above the ground, depending on the type of floor or surface and how level it is.
7. Bolt the TX Tower down using two of the 3/8" Hex head bolts and two of the 3/8" fender washers.
8. Bolt both RX towers down with two 3/8" Hex head bolts and two standard 3/8" washers per RXTower (four total bolts and four total washers)
9. Secure the RX and TX Towers using two bolts on each tower. While tightening the bolts, ensure that the tower maintains its position by checking the feet relative to the marks and confirming that it is still level. Adjust the height and location of the feet, as necessary.
10. Complete the installation, as required.

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Concealed Weapons Detection
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Documents / Resources

	**MSI Concealed Weapon Detection and Touchless Gun Screening System** [pdf] User Manual Concealed Weapon Detection and Touchless Gun Screening System, Concealed, Weapon Detection and Touchless Gun Screening System, Gun Screening System, Screening System

References

- **Camera Software Documents & Downloads**
- **H5A Modular Camera | Micro Bullet Imager Module | Avigilon**