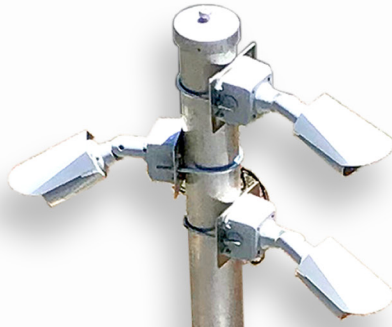




K&K Systems, inc.
Traffic Safety Products Manufacturer



WRONG WAY SYSTEMS OPERATING MANUAL



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MANUFACTURER'S WARRANTY

1. The manufacturer warrants that all products manufactured by K&K Systems, Inc. will be free from defects in material and workmanship for a period of one (1) year from date of shipment, subject to the conditions and restrictions contained herein.
2. This warranty does not apply to a product that has not been installed or maintained in accordance with the manufacturer's instructions, has been subjected to damage in an accident, abused or neglected during operation, repaired or modified by persons other than manufacturer, its employees or authorized agents, or failed to have normal maintenance.
3. The buyer expressly agrees that the buyer's sole remedy and the manufacturer's sole responsibility, in respect to a warranty claim, is exclusively limited to repair or replacement at the manufacturer's option, of product or a portion thereof found by the manufacturer to be defective. The manufacturer is not responsible for labor or other expended charges by buyer including transportation charges, and shall not be liable for any incidental or consequential damages connected with repair of a product deemed to be defective or with installation or replacement of repaired product. Further, the manufacturer disclaims any liability for any incidental or consequential damages, including lost or duplicated time or expense accruing for any reason, to the owner or user or any products sold by the manufacturer, whether claim is made in contract or in tort or under any theory of warranty, negligence or otherwise.
4. The manufacturer reserves the right to make changes in its products from time to time, without incurring any obligation to incorporate such improvements in any products previously sold or in service.
5. The terms and conditions of the warranty cannot be altered without the written consent of the manufacturer.
6. The foregoing warranty is exclusive and in lieu of all other express, statutory and implied warranties **INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE**. There are no warranties which extend beyond the language in the previous six (6) paragraphs.

If you have any further questions, please feel free to call us at our toll-free number, 888-414-3003, email info@k-systems.com or visit our website at www.k-systems.com.



THANK YOU FOR YOUR BUSINESS!

To Our Valued Customer,

K&K Systems, Inc. is excited that you have purchased our product.

Our company has been serving the traffic industry since 1997. Since that time we have risen to become a leader in the traffic industry. We offer a complete line of traffic safety products that include message boards, arrow boards, radar speed monitors, solar school zone flashers, solar 24-hour flashers and many other quality products that serve our industry today.

At K&K Systems, Inc., we strive to improve the quality of our products. We are dedicated to the concept that our customers are our most valuable resource. We strive to serve our customers as we would want to be served.

Tim Keith,
President





INTRODUCTION

As Wrong Way Drivers become more and more frequent, K&K Systems has developed multiple Wrong Way Detection and Alert Systems to keep drivers safe. K&K Systems' expandable Wrong Way Detection systems have multiple detection options to detect and determine direction violations on any type of road or in any condition. Our Wrong Way Systems can be powered using AC service or solar which allows this system to operate virtually anywhere.

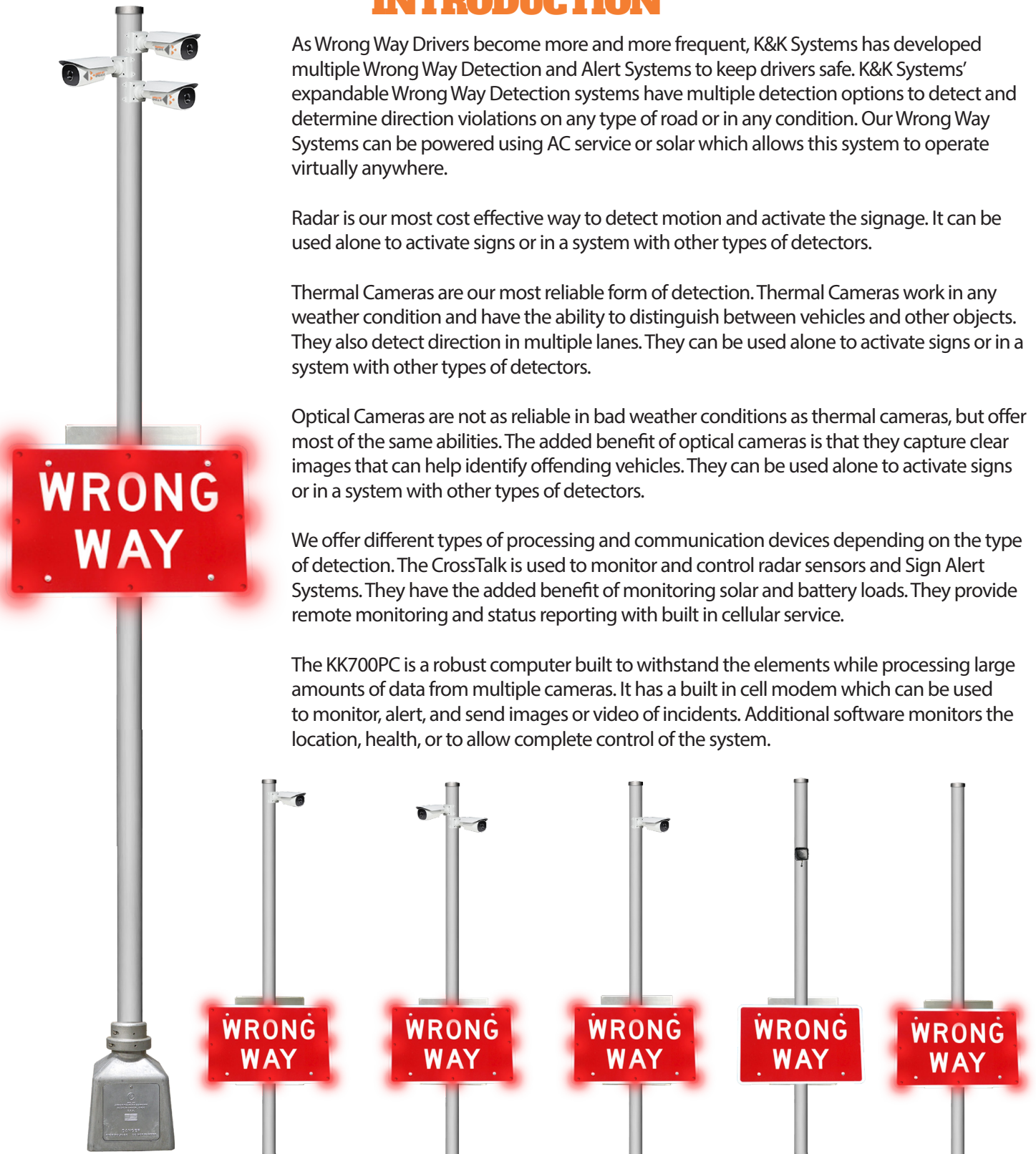
Radar is our most cost effective way to detect motion and activate the signage. It can be used alone to activate signs or in a system with other types of detectors.

Thermal Cameras are our most reliable form of detection. Thermal Cameras work in any weather condition and have the ability to distinguish between vehicles and other objects. They also detect direction in multiple lanes. They can be used alone to activate signs or in a system with other types of detectors.

Optical Cameras are not as reliable in bad weather conditions as thermal cameras, but offer most of the same abilities. The added benefit of optical cameras is that they capture clear images that can help identify offending vehicles. They can be used alone to activate signs or in a system with other types of detectors.

We offer different types of processing and communication devices depending on the type of detection. The CrossTalk is used to monitor and control radar sensors and Sign Alert Systems. They have the added benefit of monitoring solar and battery loads. They provide remote monitoring and status reporting with built in cellular service.

The KK700PC is a robust computer built to withstand the elements while processing large amounts of data from multiple cameras. It has a built in cell modem which can be used to monitor, alert, and send images or video of incidents. Additional software monitors the location, health, or to allow complete control of the system.



Thermal and (2) IR Cameras
WWS-SP/AC-1

Thermal Only
WWS-SP/AC-2

(2) IR Cameras
WWS-SP/AC-3

(1) IR Camera
WWS-SP/AC-4

Radar Sensor
WWS-SP/AC-5

24/7 Sign Alert
WWS-SP/AC-6



PRECAUTIONS, SAFETY, AND MAINTENANCE

The following are K&K Systems' recommendations for the safe and responsible use.

PRECAUTIONS

Inspect your unit upon delivery. The system arrives ready to run. However, wires and plugs may loosen during shipment causing operational issues.

Please inspect all components and test before erecting the pole. It's always easier to work on the ground. Connect the batteries and test the unit before installation for convenient working conditions.



Connect batteries and test components before erecting the pole system.



Check cardinal directions with a compass to ensure that the solar panels are **facing South** for proper charging. Check the system a few days after installation to ensure proper charging and operation.

MAINTENANCE

- Periodically inspect the poles. This includes but is not limited to the solar panels, battery, signs, and boxes.
- Check sign mounting to ensure it is tight and has not shifted as the solar panels may shift direction over time. Ensure the panel is facing South with a compass.
- Check the battery every 6 months to ensure proper charging. If below 12.3 volts, charge to keep power reserves high. Check solar system by cleaning the panels and inspecting wiring for wear and secure connection.
- K&K recommends that the user clean the solar panels every 6 months. Over time the solar panels may build up a thin layer of dust/dirt/road grime that can adversely affect their efficiency significantly. Clean with soapy water or glass cleaner and a soft cloth or sponge only.

BATTERY SAFETY

It is important that you know that, while 12V DC is not likely to cause electrical shock, batteries can produce large amounts of current that can instantly melt tool, and burn wires. Become familiar with battery operation to avoid injury.

BATTERY CHARGER SAFETY

If optional battery charger is installed the battery charger is preset in automatic position. **DO NOT CHANGE THESE SETTINGS** because of possible overcharging of batteries. Plug cord into a standard 120V AC for charging.

SOLAR SAFETY (SP MODELS ONLY)

To reduce the risk of shock or burn during maintenance, solar panels should be covered with an opaque material and power converter/battery charger should be disconnected from AC power supply.

SOLAR MAINTENANCE

- K&K recommends that the user clean the solar panels every 6 months. Over time the solar panels may build up a thin layer of dust/dirt/road grime that can adversely affect their efficiency significantly.
- Check the batteries every 6 months to ensure proper charging. If below 12.3 volts, charge to keep power reserves high. Check solar system by cleaning the panel and inspecting wiring for wear and secure connection.
- Check that the mounting is secure and has not shifted as the solar panel may shift direction over time. Ensure the panel is facing South.
- Check the system a few days after installation to ensure proper charging and operation.
- Clean the camera lenses with a microfiber cloth periodically to ensure a clear image.
- Check camera angles

CAMERA MAINTENANCE

- Periodically inspect the cameras. This includes but is not limited to the lens, sun shroud, and mounting hardware.
- Check camera mountings to ensure it is tight and has not shifted as it may shift direction over time.
- K&K recommends that the user clean the lenses every 6 months. Over time the lenses may build up a thin layer of dust/dirt/road grime that can adversely affect their visual clarity and efficiency. Clean lens cleaner and a microfiber cloth only.



COMPONENTS AND CONTROL CABINET

CONTROL CABINET

The control box is aluminum fabricated with a hinged door to protect the controller and/or batteries. It is located on the pole or at the top of the pole for ECO models.

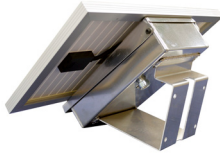


KK-700PC is a robust computer built to withstand the elements while processing large amounts of data from multiple cameras. It has a built in cell modem which can be used to monitor, alert, and send images or video of incidents. Some features may require a cellular service plan. Additional software monitors the location, health, or to allow complete control of the system.



SOLAR POWER SOURCE

Our solar powered (SP models) products incorporate a battery pack wired for 12V operation, depending on the requirements of the design. The battery bank is regulated by and protected by a solid-state charge controller/low voltage disconnect. This prevents gassing and over discharging of the batteries, which can result in premature failure. A thermal compensation and related circuitry adjusts the charge rate of the system with variances in temperature.



SIGN ALERT SIGNS are LED illuminated signs. They are operated by solar or AC power and are designed to enhance the visibility of highway signs in any weather conditions to increase road safety. All signs are MUTCD compliant. Sign Alerts utilize any the CrossTalk when paired with a Radar Sensor for activation or custom functionality. A timing module is used for 24/7 flashing units.

SOLAR PANEL

During operation, keep the solar panel clean of excessive dirt and debris by using soapy water or glass cleaner and a soft cloth or sponge only. Periodically check the integrity of wiring connections in the junction box. Inspect for signs of damage to the solar panel glass or frame.



LIGHTING CONTROLLER

The CrossTalk Advanced Lighting Controller are compact all-in-one solar controllers with flashers and auto-dimmers. They are compatible with all 24-7 Solar Sign Alerts and beacons. They have dry contact switches for activation via sensors such as radar. The CrossTalk allows monitoring/status reporting, and control of one or multiple systems. Some services require a cellular service plan.



AC POWER SUPPLY

Our AC systems utilize a single output power supply that works with 120V and 220V. As a class II power unit, it is housed with the UL 94V-0 rated flame retardant plastic enclosure. IP67 design.

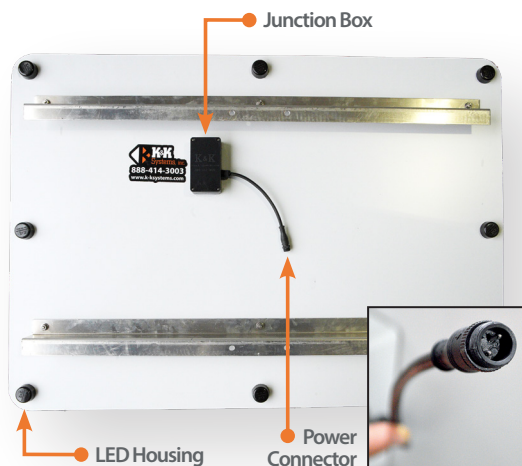


NOTE:
120V or 220V AC requirements must be specified when the system order is placed.



Diamond Grade Reflective Sheeting
Optional

LED Light Emitting Diode



Junction Box

LED Housing

Power Connector



SYSTEM DETECTION COMPONENTS RADAR



SS400 DOPPLER sign activation/speed sensor/Doppler Radar

- K-Band Doppler radar at 0.05 Watts
- 300+ feet (90+m) typical pickup range for a compact vehicle
- Ground speed tracking and measurement mode
- FCC pre-approved with CE mark
- Fully configurable via RS232 serial port for all settings
- Simple rotary switch or thumbwheel input possible to set threshold
- Wide input operating range allows solar operation
- 1.75Wx1.65Hx0.5D in (44x42x12 mm) open frame ultra-thin profile
- 1.9Wx2.1Hx0.9D in (4.5x4.8x2.4 cm) weatherproof enclosure option
- Firmware "boot loader" allows for field upgrading of firmware
- Two LED Lamp outputs to drive 1.8W LED lamps with dimming
- One photo sensor input to sense ambient light to dim LED lamps
- 100% self-test feature built-in including self power usage
- Best in class "Advanced In-Radar" traffic statistics option available
- True Average Speed feature built-in for very low cost, easy to deploy, average traffic speed measurements on the road
- IO expansion board w/ DB9 connector, rotary s/w and isolated high power output available



PD310 FMCW Milli-power radar

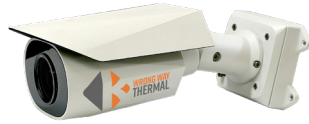
- FMCW radar. 0.18 Watts
- Simultaneously tracks up to six targets within a range of 120ft (37m).
- Available with 38x45° (PD300) or 20x60° (PD310) beam options.
- Up to 6 user-configurable lanes allows for maximum detection flexibility
- Unmatched range resolution down to 0.25 inch (0.63cm) (see manual).
- Highway & intersection optimized modes allow variety of applications.
- Six trigger outputs can be mapped to any combination of lanes.
- Companion Windows application provides intuitive GUI to set all.
- Configuration parameters and display real time plots of the targets.
- Wide input voltage range and low power simplifies solar operation.
- Firmware "boot loader" allows for field upgrading of the firmware.
- 100% built-in self-test for high confidence.
- IO break-out board available for quick evaluation.
- Built-in statistics storage memory for stand-alone data gathering.
- Full industrial temperature range. Potted for high reliability.
- FCC pre-approved with CE mark.



SYSTEM DETECTION COMPONENTS THERMAL AND IR CAMERAS

THERMAL CAMERA

The Avigilon H4 Thermal camera is embedded with a self-learning video analytics to provide long-range perimeter protection and leverages thermal technology to operate under challenging conditions while minimizing false alarms.



It is designed to detect the presence and movement of people and vehicles in areas with poor visibility, including partly camouflaged scenes, low lighting and even absolute darkness, without the need for additional light sources.

AUDIO CAPABILITIES - Available ports for external audio including sirens, microphones and/or loudspeakers for audio talk-down situations

EXPANDABLE STORAGE - Slot for either SD or MicroSD memory prevents loss of recorded video during network or server interruptions

HDSM SMARTCODEC™ TECHNOLOGY - Optimizes compression levels for regions in a scene to help maximize bandwidth savings, helping to keep internet connectivity costs down

HIGH DEFINITION STREAM MANAGEMENT (HDSM)™ TECHNOLOGY - Provides maximum image detail while minimizing bandwidth usage, helping to keep internet connectivity costs down

ONVIF® COMPLIANT - Built on an open platform to allow integration with other security solutions

RELAY I/O CONNECTIONS - Configure input/output actions and alarms for fast event response

SELF-LEARNING VIDEO ANALYTICS - Recognize threats without predefined rules to help you detect, verify and act faster

WEATHER & IMPACT RATED - IP66/7 weather rating and IK10 impact rating for vandal resistance

OPTICAL IR CAMERA

features next-generation video analytics technology to help focus your attention on potentially critical events, providing a smarter and more powerful video security solution from the moment you set it up.



Offers more reliable detection of up to 50 objects in the scene, even if they are stationary, helping to alert you of important events that are happening at any location including traffic violations.

The IR Optical Camera combines high-definition imaging, self-learning video analytics, network video recorder functionality and embedded Avigilon Control Center™ video management software to create an all-in-one video security solution.

H4ES cameras record video directly to an on-board solid-state drive, eliminate the need for a separate NVR, and reduce installation and system costs.

The H4ES camera line provides unique flexibility and versatility, with deployment options ranging from standalone installation, multi-camera solutions, to seamless integration into a conventional network video surveillance system.

As an internet of things device, the solution acts as both a camera and out-of-the-box video management software platform, providing a uniquely easy-to-install and cost-effective surveillance solution that features Avigilon Control Center™ software.

The H4ES tracks and monitors vehicles while stationary or moving and determine direction and violations.



OPTICAL IR CAMERA CONTINUED

ADAPTIVE IR - Automatically adjusts IR beam width and exposure settings based on scene conditions to help maximize image quality

AUDIO CAPABILITIES - Available ports for external audio including sirens, microphones and/or loudspeakers for audio talk-down situations

HDSM SMARTCODEC™ TECHNOLOGY - Optimizes compression levels for regions in a scene to help maximize bandwidth savings, helping to keep internet connectivity costs down

HIGH DEFINITION STREAM MANAGEMENT (HDSM)™ TECHNOLOGY - Provides maximum image detail while minimizing bandwidth usage, helping to keep internet connectivity costs down

INTEGRATED IR ILLUMINATORS* - Integrated IR LEDs provide uniform illumination, even in complete darkness
** IR models are optional*

LIGHTCATCHER™ TECHNOLOGY - Offers exceptional detail in areas with low lighting

MULTIPLE FORM FACTORS - Offers the flexibility to choose a form factor that works best for your application for ease of installation

MULTIPLE LENS OPTIONS - Choose from various lens types, including long zoom, for flexible coverage options

REMOTE FOCUS & ZOOM - Once mounted and aimed, the zoom level can be adjusted and image can be focused remotely

SELF-LEARNING VIDEO ANALYTICS - Recognize threats without predefined rules to help you detect, verify and act faster

SOLID STATE DRIVE - Operating system is on a separate solid-state drive for greater performance and reliability

WEATHER & IMPACT RATED - IP66 weather rating and IK10 impact rating for vandal resistance

WIDE DYNAMIC RANGE - Captures details in scenes with both very bright and very dark areas

5-YEAR WARRANTY - Avigilon stands behind the quality of this product with a 5-year, industry-leading warranty

AVIGILON APPEARANCE SEARCH™ SUPPORT - Enables our sophisticated deep learning AI search engine that enables you to quickly locate a specific person or vehicle of interest across an entire site

EXPANDABLE STORAGE - Slot for either SD or MicroSD memory prevents loss of recorded video during network or server interruptions

HIGH DEFINITION STREAM MANAGEMENT (HDSM)™ TECHNOLOGY - Provides maximum image detail while minimizing bandwidth usage, helping to keep internet connectivity costs down

HIGH-EFFICIENCY VIDEO CODING - Combines HEVC/H.265 video compression with HDSM SmartCodec™ technology to substantially reduce storage and bandwidth requirements while maintaining exceptional image quality

LICENSE PLATE RECOGNITION COMPATIBILITY - Works with ACC™ software for accurate license plate capture at a range of distances and speeds

MADE TO TRUST - We are proud to be a company that manufactures high quality products which our global customers can rely on

NEXT-GENERATION VIDEO ANALYTICS - Expanded object classifications and more accurate detection in crowded scenes so you can detect faster

ONVIF® COMPLIANT - Built on an open platform to allow integration with other security solutions

RELAY I/O CONNECTIONS - Configure input/output actions and alarms for fast event response



SYSTEMS COMPONENTS - KK700 PC SERVER

The KK700 PC is a rugged edge computer matching high-performance with functional adaptability for reliable operation in virtually any environment. Blazing fast Hexa-Core Coffee Lake processors and 9th Gen processors (coming soon) push the limit of what's possible with embedded computing.

The C246 chipset enables Xeon processing and ECC memory for rugged server capability at the edge and allows for real-time machine learning, object detection, and behavior recognition while minimizing the dependency on large-scale data centers for data processing and reducing the cost of data transmission over paid data networks.

We built KK700 PC to meet MIL-STD-810G, UNECE Reg. 10 E-Mark, and EN50155 rolling stock standards* to ensure stable and reliable performance to keep your application up and running even in the most challenging environments.

Our Hardshell Fanless design, medical-grade ESD and interference protections, and solid-state components allow the system to thrive where most computers would fail and support wide input voltage of 9-48VDC and operating temperature range of -40-70°C.

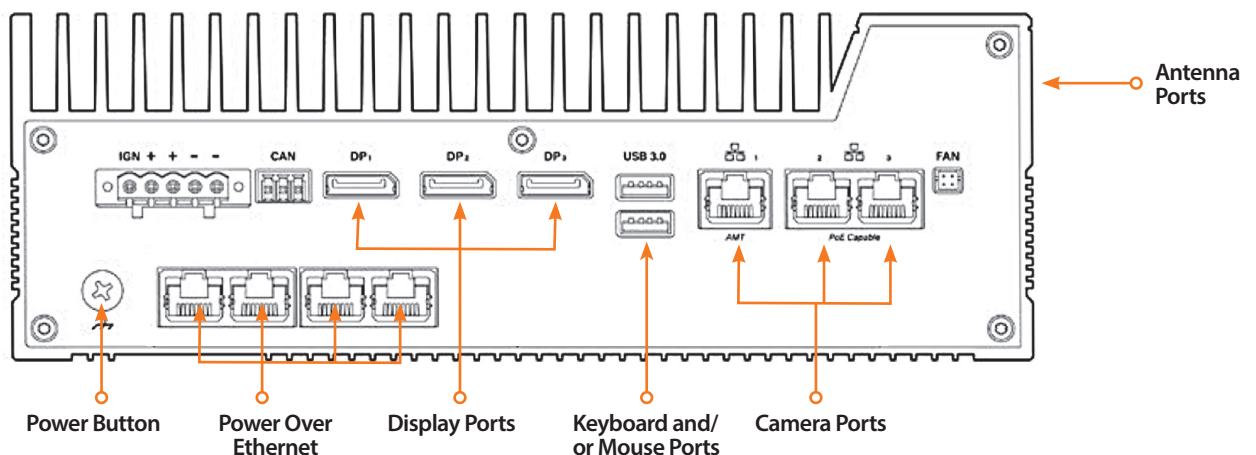
*Configuration dependent.

KK700 PC was designed for flexible and reliable performance at the edge. Standard features include integrated CAN bus and 8-bit DIO, 6 USB 3.1 Gen 1 ports, triple Gb LAN and support for triple independent displays via DisplayPort connectors. Connectivity options include 4G LTE, AC Wi-Fi, and gigabit LAN while support for up to four separate storage drives (two high-speed NVMe drives and two optional hot-swap drives) offers ample storage capacity.



Customize the system to your exact application needs with our ModBay™ expansion technology to deploy additional gigabit LAN, PoE support, and dual mPCIe expansion with external SIM support.

This system is compatible with our Extrovert 4G LTE technology, an integrated modem pre-certified to operate on many of the world's most popular cellular carrier networks. Extrovert 4G LTE hardware is ideal for today's mobile, edge computing and Industrial Internet of Things applications. To take advantage of this feature, simply configure your system with Extrovert 4G LTE connectivity and then contact your carrier to activate.



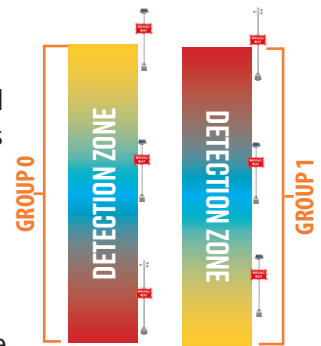


SYSTEM COMPONENTS - CROSSTALK CONTROLLER

The CrossTalk is a rugged, integrated, compact, all-in-one advanced, solar powered lighting controller, flasher, auto-dimmer and scheduler. On-board cellular technology provides a secure cloud server connection offering real-time access from almost anywhere. CrossTalk controllers can be accessed and configured with a desktop computer, laptop computer, or any smart mobile device with cellular service to control a single sign or multiple signs in multiple locations. Designed for multiple applications, CrossTalk controllers are used for a variety of traffic & safety applications including school zone safety systems, bridge navigation beacons, cross-walk / pedestrian systems, speed/radar systems and more. Utilizing solar power and both cellular and short-range wireless connectivity, CrossTalk applications can be setup quickly and provide more functionality and flexibility than traditional “wired” systems. A single CrossTalk can control multiple nodes across an entire campus and provide web connectivity for schedules, status monitoring, diagnostics, and real-time control.

NETWORKING Each CrossTalk unit has a unique network address (0-15) set easily with an on-board rotary switch. This unique address allows cellular devices (laptops, computers, smartphones) to communicate with the primary CrossTalk that communicates with secondary devices in the same group. The NET ADDR for the primary CrossTalk unit is “zero” (0). All other CrossTalk must have their own unique NET ADDR without duplication (1-15).

GROUPING A primary CrossTalk controller can monitor and control up to 15 secondary CrossTalk units (for a total of 16 grouped units). Each CrossTalk unit also has a GROUP switch (0-15) which allows CrossTalk units to be “grouped” together. All devices with same GROUP number can communicate with each other. This grouping function allows control/monitoring of each GROUP separate from other GROUPS in the same general location.



Example: Detection Zones that are within close proximity must have different Group numbers to prevent communication with Wrong Way System.

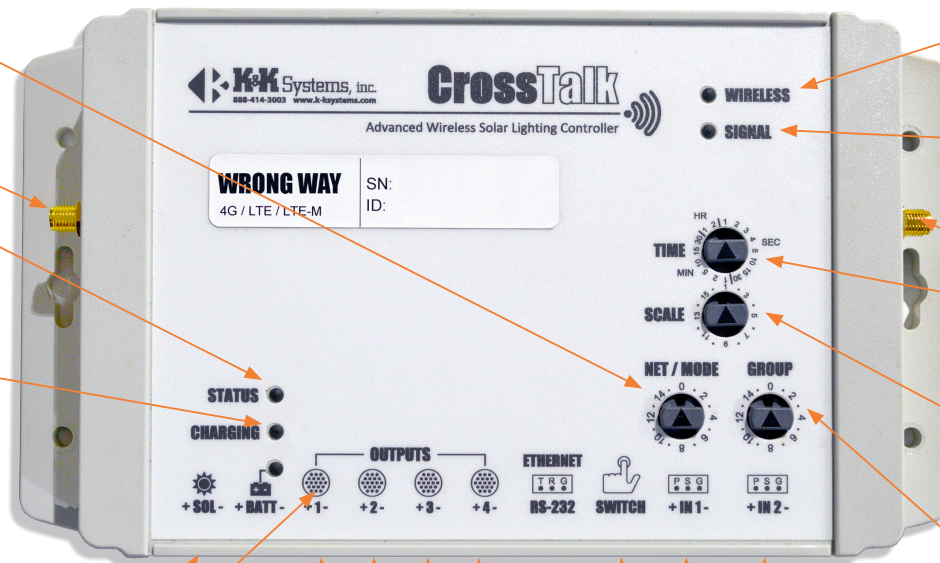
Net/Mode Setting
Sets unique address for each unit in a group

Cell Modem

Status Light
The status light flashes in sequence with the first output to indicate the flasher is active and flashing rate.

Charging Light
Solar controller status indicator shows when the battery is being charged:
Green = Charged
Amber = Charging

Solar Port
Solar connection port



Wireless Light
When lit, indicates that a wireless device is connected

Signal Light
Indicates the strength of wireless signal during communication

900 MHz Antenna

Time
Set the amount of time that lights flash in hours, minutes, and seconds

Scale
Multiplies time setting meaning:
 $TIME \times SCALE = \text{run duration}$

Group Setting
All devices with the same GROUP setting can communicate with each other.

Battery Light
Battery status light for safe accurate connections:
Green = Good connection

LED Outputs 1,2,3,4
Outputs 1 and 2 are for forward direction. *Outputs 3 and 4 are for the opposite direction for double-sided sign configuration.*

Switch
Radar trigger input for vehicle detection

In 1
For forward radar
In 2
For opposite direction radar



CAMERA HARDWARE INSTALLATION

BEFORE ARRIVING ON-SITE

Familiarize yourself with the system design and the customer network setup to streamline the setup process.

Each camera must be:

- ▶ Connected to the network system.
- ▶ Positioned in the direction specified in the system design.
- ▶ Assigned a descriptive name (i.e.: highway intersection).
- ▶ Assigned an IP address system.

Before a camera is connected to the ACC system, it can be configured from the camera web interface or using the Avigilon Camera Configuration Tool.

Inspect your unit upon delivery. The system arrives ready to run. However, wires and plugs may loosen during shipment causing operational issues.

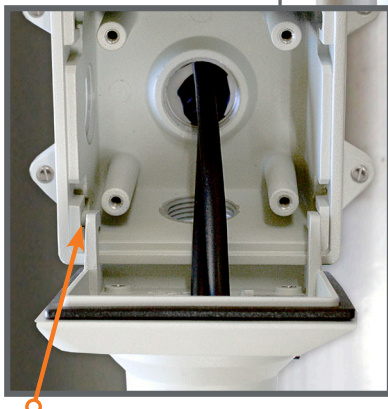
Please inspect all components and test before erecting the pole. It's always easier to work on the ground. Connect the batteries and test the unit before installation for convenient working conditions. Check cardinal directions with a compass to ensure the solar **facing South** for proper charging. Check the system a few days after installation to ensure proper charging and operation.



Connect batteries and test components before erecting the pole system.

INSTALLING CAMERAS

Install devices according to the system design. When your system arrives the camera mounting box will be mounted in place. The base of the camera housing has hooks. Place those into the slots inside the mounting box. This allows the camera to hang securely. Connect camera wiring to the wiring already installed inside the post.

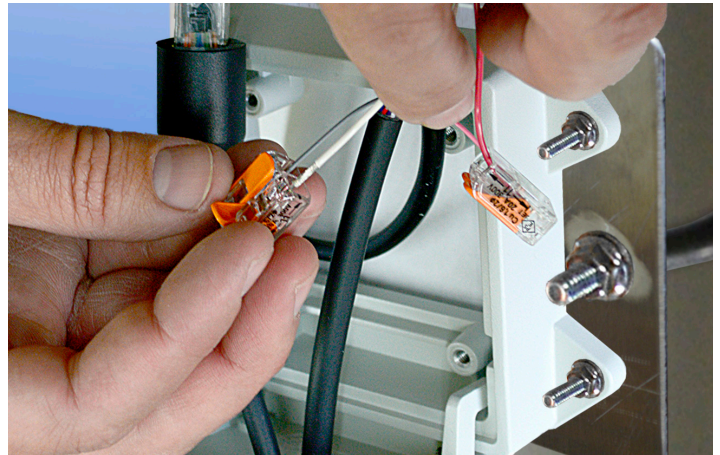


Slide hooks into housing slots.



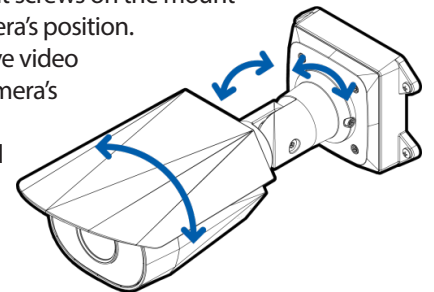
CONNECTING CAMERAS TO THE CROSSTALK CONTROLLER

- ▶ Flip up the orange lever on the connector to allow the wire to be inserted.
- ▶ Insert the **RED** wire from thicker gray wire coming from inside the pole into the connector with the **pink** wire coming from the cameras. Push down the orange lever to secure the wires.
- ▶ Insert the **WHITE** wire from thicker gray wire coming from inside the pole into the connector with the **gray** wire coming from the cameras. Push down the orange lever to secure the wires.



POSITIONING CAMERAS

- ▶ Thermal camera points toward on-coming traffic
- ▶ Systems using (2) IR cameras: Point one toward on-coming traffic and the other at going-away traffic.
- ▶ Systems using (1) IR camera: Point one toward on-coming traffic
- ▶ To aim the camera, loosen the adjustment screws on the camera mount arm, look down the body of the camera to generally aim the cameras toward the detection zone.
- ▶ Tighten the adjustment screws on the mount arm to secure the camera's position.
- ▶ Review the camera's live video stream to verify the camera's view.
- ▶ The sun shroud should be set as far forward as possible without intruding on the video image. Slide the sun shroud forward or back to protect the camera against glare from the sun.
- ▶ In the camera web browser interface or the Avigilon Control Center software adjust the camera's Image and Display settings. You can set the zoom position, focus and change the image rotation.





CAMERA SOFTWARE SETUP

SOFTWARE INSTALLATION


Your system comes with the Avigilon Control Center (ACC) preloaded. This software is the latest and most advanced version of ACC™ video management software. Designed to bring the right information to you so that you can take action, ACC provides an easy-to-use, AI-enabled user interface to help ensure critical events do not go unnoticed.

Advanced AI technology that highlights the unanticipated by automatically flagging unusual motion and activity. This edge-based intelligence technology distinguishes between typical and atypical events by continuously learning from observation of scenes over time. Unusual Motion Detection (UMD) detects atypical movement, while Unusual Activity Detection (UAD) is object-aware and detects the anomalous speed and location of people and vehicles.


LOGGING IN

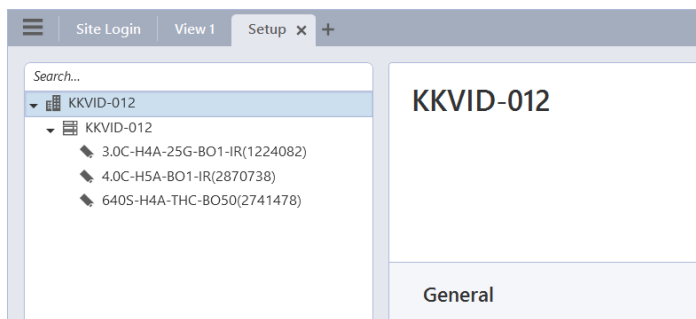
Contact K&K Systems for login information. Your system will have your specific Wrong Way System locations named and in the system.

To open the ACC Client software:

- ▶ Double-click the desktop shortcut icon .
- ▶ In the Start menu, select **All Programs or All Apps > Avigilon > Avigilon Control Center Client.**

When logging in to the site for the first time, the default credentials use administrator as the username without a password. You'll be asked to immediately enter a new password.

1. In the New Task menu , click Site Login.
2. Select your site from the list of connected sites. If you don't see your site, click Find Site... to manually search your network.
3. Enter your credentials, or select Use current Windows credentials and click Log In....



NETWORK SETUP

For most systems using Avigilon-certified network video recorders (NVRs) and NVR workstations, no network configuration is required.

TIP: For bulk configuration, use the Camera Configuration Tool available on avigilon.com. You can also use the device's web interface for configuration. If needed, use the Avigilon USB Wifi Adapter System to access the camera interface through a wifi network.

IP Addressing

Your system's IP Address is setup by K&K Systems. Call K&K for more information.

Network Connectivity

Ensure each server NIC is connected to a network switch port that is 1 Gbps or higher. The server NIC connected the customer's network can have a 100 Mbps connection if the expected outbound traffic is low.

MANAGING CERTIFICATES

By default, the ACC server uses a self-signed certificate for verifying client communications. Avigilon recommends using a trusted CA-signed certificate or other intermediate certificate, such as a Windows CA or custom CA certificate. You must be a Windows Administrator to make these changes.

CONFIGURE SITES & SERVERS

In the ACC software, a site can contain one or more servers depending on the license edition. Site settings control user access and system-wide events. Server settings control video and storage settings for devices connected to that server.

When there are multiple servers in a site, you can assign a failsafe connection to a backup server. This connection allows a device to continue recording if the primary server fails.

NAMING SITES OR SERVERS

Give sites and servers meaningful names to easily identify them in the System Explorer.

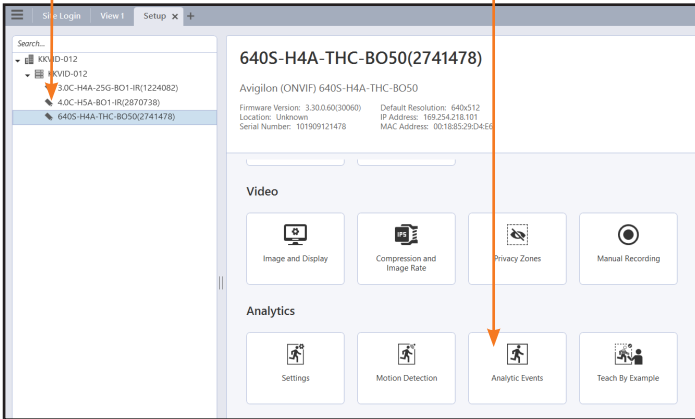
1. In the New Task menu, click Site Setup.
2. Select a site or server, then click General.
3. Enter a name, then click **OK**.



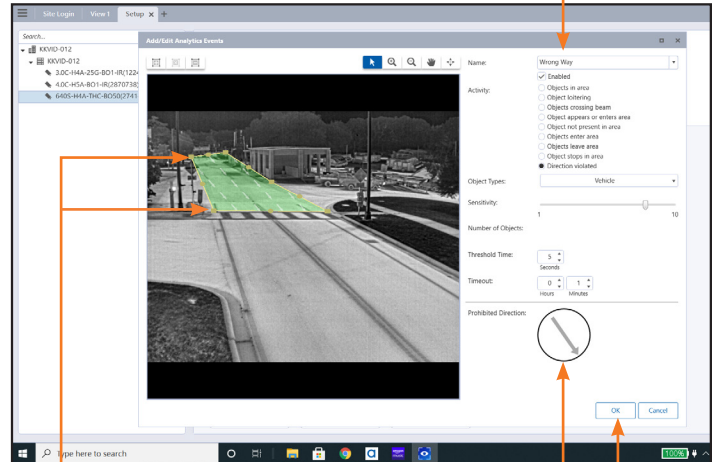
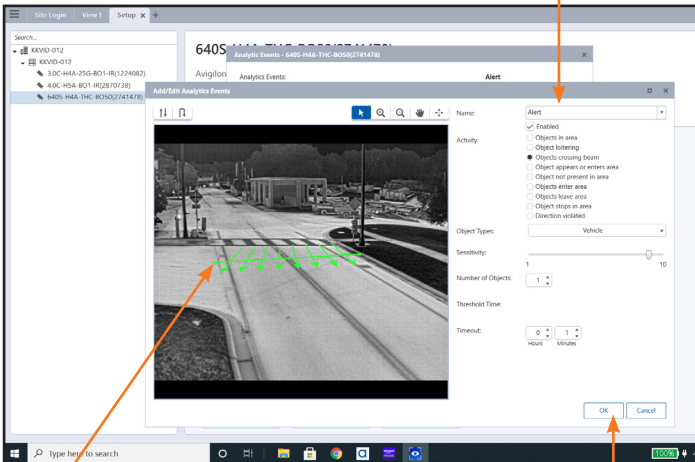
ANALYTIC EVENTS SETTINGS

SET ANALYTIC EVENTS

- 1) Under the Setup tab and select a camera from the menu.
- 2) Select Analytic Events



- 3) Choose each preloaded event.



- 4a) Click on anchor points to move the arrows to align the traffic flow.
- 5a) Verify the traffic direction is correct.
- 6) Enter a name, then click **OK**.

- 4b) Select the detection zone by clicking on anchor points to set the shape of the zone.
- 5b) Rotate the arrow with your mouse to set the Prohibited Direction.
- 6b) Click **OK**.

- 7) Continue through each event to finish setup.
- 8) Click OK on each page.





CAMERA SOFTWARE

Controlling Live and Recorded Video

When you monitor video, you can choose to watch live and recorded video in the same View tab, or only one type of video per View tab.

Once you've added cameras to the View tab, you can do the following:

- To switch all of the image panels in the View between live and recorded video, click either  **Live** or  **Recorded** on the toolbar.
- To switch individual image panels between live and recorded video, right-click the image panel and select either **Live** or **Recorded**.

Tip: If you cannot see either  **Live** or  **Recorded** on the toolbar, you may need Dual Authorization. For more information, see *Requesting Dual Authorization* below.

Adding and Removing Cameras

At any point in time, you can add and remove cameras to your View using your System Explorer.

- Click and drag a camera from the System Explorer to an empty image panel in the **View** tab.

Tip: You can view the same camera in multiple image panels to maintain different zoom levels.

- To remove the camera, in the top-right corner of the image panel click .

Maximizing Image Panels

In the top-right corner of the image panel, click  to maximize the video. Click  to return to the previous size.

Requesting Dual Authorization

If your system has enabled Dual Authorization, a second user must also log in to your ACC site before you can see recorded video.

Request permission from a user with authorization power.



1. In the System Explorer, right-click the  site then select **Dual Authorization Log In**.
2. The second user must enter their username and password.
3. Click **Log In**.

You now have access to recorded video.

Manually Recording Video

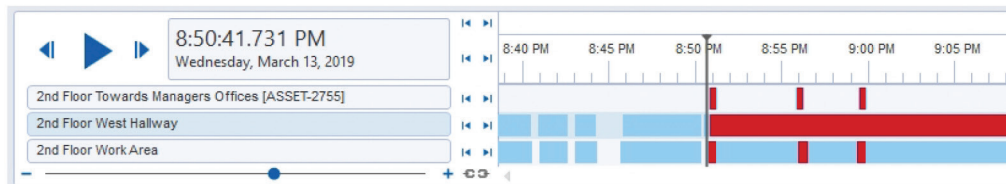
Manual Recording requires the Record Indicator overlay to be enabled. For more information, see *Video Overlays* on page 1.

From the moment that you notice unusual behavior or an event, you can begin recording.









1. In the image panel you want to record, click  in the top left corner to start recording. The blue icon indicates recording has started.
2. Click  to end recording.

Playing Recorded Video with the Timeline

The Timeline displays when video was recorded and lets you control video playback. Recorded video may be stored on the ACC Server or the archive storage location.



The colored bars on the Timeline show the camera's recording history:

-  — motion event video.
-  — recorded video.
-  — bookmarked video.
-  — protected bookmarked video.
-  — selected motion or event search result video.
-  — video archived by the Continuous Archive feature. Click the area to load archived video from that time range:
 -  — archived motion event video.
 -  — archived video.



Tip: You can also review archived video by opening the archived AVK file in the Avigilon Player software.

You can view and play through archived video, but you cannot skip between recorded events or search archived video.

- Empty areas show that there is no recorded video.

If you are missing recorded video due to a network connection or server issue, the system can recover the video from an ONVIF Profile G camera that has an SD card recording video. For more information, see *Recovering Video from Profile G Cameras* on page 1.

For more information about bookmarks, see *Bookmarking Recorded Video* on page 42.

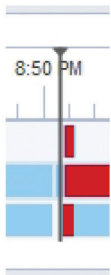



If a camera is configured with failover connections:

- The camera can appear in multiple locations in the System Explorer. Contact your system administrator to configure your privileges to view the camera under each failover connection.
- To view recorded video, select any instance of the camera in the System Explorer.

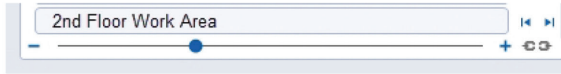
For more information, see *Failover Connections*.

Using the Timeline

Tip: To see how many days of recorded video are available, zoom out of the Timeline. To configure these settings, see *Recording and Bandwidth* on page 1.

To...	Do this...
Select a playback time	 <ul style="list-style-type: none">• Click the date and select a specific date and time.• Click a point on the Timeline. The marker appears on your selection. Drag the Timeline marker to preview video at different times.
Start playback	Click  . <ul style="list-style-type: none">• Click  to fast forward. Click again to increase the playback speed. Maximum speed is 8x.• Click  to rewind. Click again to increase the playback speed.



To...	Do this...
Stop playback	Click . <ul style="list-style-type: none">• Click ▶ to go forward one frame.• Click ◀ to go backward one frame.
Jump forward or backward	Click ⏮ or ⏭ to jump forward or backward by a day, minute, or by camera event.
Zoom in or out of the Timeline	<ul style="list-style-type: none">• Move the slider on the bottom left.  <ul style="list-style-type: none">• Place your mouse over the Timeline and scroll. <p>You can zoom in to a quarter of a second, and zoom out to see years if recorded video exists.</p>
Pan the Timeline	<ul style="list-style-type: none">• Move the horizontal scroll bar under the Timeline.• Right-click and drag the Timeline.
Center the Timeline	Right-click the Timeline, and select Center on Marker .

Synchronizing Recorded Video Playback


Synchronizing recorded video playback allows you to synchronize Timelines across multiple tabs while they are in recorded mode.

Synchronized recorded video playback is disabled by default. Once it is enabled, it will remain enabled until it is manually disabled.

Note: Tabs can only be synchronized to one time. You cannot synchronize groups of tabs to separate times.





Enabling Synchronized Playback

- To enable synchronized video playback in all new View tabs, select  > **Client Settings** > **General** > **Synchronize recorded video playback**.

The Timelines in new View tabs are automatically centered on the current time.

Enabling synchronized recorded video playback in the Client Settings dialog box will not synchronize the Timelines of previously opened tabs, it will only synchronize new tabs that are opened after enabling synchronized recorded video playback. Previously opened tabs need to be synchronized individually.



- To synchronize playback between specific tabs, click  at the bottom of each Timeline. The icon changes to  to show that it is now synchronized.

The Timeline will synchronize with the first tab you selected.

Disabling Synchronized Playback

- To disable synchronized recorded video playback in all new View tabs, clear the **Synchronize recorded video playback** checkbox in the Client Settings dialog box.

Previously synchronized tabs will remain synchronized.

- To disable synchronized video playback in individual tabs, click  at the bottom of the Timeline. The icon changes to  to show that synchronized playback is disabled.

The Timeline will continue to display the same time but will no longer be synchronized with other Timelines.

Using Instant Replay

To review an event that just occurred, you can immediately access recently recorded video through the instant replay feature.

- Right-click the image panel and select one of the instant replay options:
 - **Replay - 30 Seconds**
 - **Replay - 60 Seconds**
 - **Replay - 90 Seconds**



Viewing Unusual Events

When viewing recorded video from a video analytics device, the Timeline displays motion, Unusual Activity, and Unusual Motion events. For more information, see *Unusual Motion and Unusual Activity* on page 1.

You can filter the Timeline to display Unusual events only.

1. In the top-left corner of the Timeline, select the **Unusual Activity** or **Unusual Motion** checkbox.
2. Select the **Skip Play** checkbox to skip to the next event when playing video.
3. Select which **Anomaly Type** to display:
 - **All** — All unusual events.
 - **Speed** — Events with unusual speed.
 - **Direction** — Events with unusual direction.
 - **Location** — Events in areas where activity does not typically occur.
4. Move the **Rarity** slider to set how rare an event must be. Keep the slider towards the right to reduce noise.
5. Enter a **Minimum Duration** between 0-59 seconds to set how long an event must last. The default value is 2 seconds.
6. Use the Timeline controls to view the event video.

Unusual Activity is highlighted in yellow bounding boxes. Unusual Motion is highlighted in teal bounding boxes. Image panels without unusual events are dimmed.

You can bookmark and export unusual events like other video analytics events. For more information, see *Bookmarking Recorded Video* on page 42 and *Exporting* on page 39.

Zooming and Panning

To get a better look at events in video, you can zoom or pan to focus on a section of the camera's field of view.

Tip: Fisheye and panomorph video automatically dewarps when you zoom and pan.

Zooming

- Scroll the mouse wheel inside an image panel.

Panning

- Right-click and drag inside an image panel.

You can also use the Zoom   and Pan  icons on the right side of the toolbar.

For more shortcuts, see *Keyboard Commands* on page 45.





Controlling PTZ Cameras

Pan, Tilt, Zoom (PTZ) controls allow you to control cameras with PTZ features, including cameras with fisheye and panomorph lenses. You can control a PTZ camera by using the on-screen controls or by using the tools in the PTZ Controls pane.

For other ways to use the PTZ Controls, see *Keyboard Commands* on page 45.

Note: For video analytics devices, classified object detection only works when the camera is in its Home position.

1. In the toolbar, click . PTZ controls are now enabled in image panels that are displaying PTZ video.
2. In the image panel, click .

The PTZ Controls are displayed in a floating pane immediately beside the image panel.

The controls may appear differently depending on the options that the camera supports.

3. To pan or tilt, do one of the following:
 - In the image panel, drag your mouse from the center to move the camera in that direction. The farther the cursor is from the center of the image panel, the faster the camera will move.
 - If the camera supports Click to Center, click anywhere on the image panel to center the camera to that point.



4. Use the other PTZ controls to perform any of the following:

To...

Do this...
















Zoom

- Click  to zoom in.
- Click  to zoom out.



To...

Do this...

	<ul style="list-style-type: none">• Click the image panel and use the mouse scroll wheel to zoom in and out.• If the camera supports Drag to Zoom, click and drag to create a green box to define the area you want to zoom in and see.• Right-click the image panel and select Zoom Out Full.
Control the iris	<ul style="list-style-type: none">• Click  to close the iris.• Click  to open the iris.
Control the focus	<ul style="list-style-type: none">• Click  to focus near the camera.• Click  to focus far from the camera.
Program a PTZ preset, pattern, or tour	For more information, see <i>PTZ Presets, Patterns, and Tours</i> on the next page.
Activate a PTZ preset	Select a preset then click  .
Return to the Home preset position	If the PTZ camera supports a Home preset position, click  to return the camera to its Home position.
Activate a PTZ pattern	<p>In the PTZ Controls pane, select a pattern number and click .</p> <p>The pattern will repeat until the pattern is stopped or another pattern is run.</p>
Activate a PTZ tour	<p>In the PTZ Controls pane, select a tour number and click .</p> <p>The tour will repeat until stopped or until other PTZ controls are used.</p>
Activate an auxiliary command	<ol style="list-style-type: none">1. Select an aux command number and click .2. Click  to turn off the auxiliary output.
Display the PTZ camera on-screen menu	<ol style="list-style-type: none">1. Click .2. To move through the menu options, click any of the following:<ul style="list-style-type: none">• Click  to move down the options.• Click  to move up the options.• Click  to confirm your selection.• Click  to cancel your selection.



To...

Lock the PTZ controls

Do this...

Click .

Other users will be unable to use the PTZ controls for this camera until you unlock the controls or log out.

Users ranked higher in the Corporate Hierarchy will be able to override and re-assign the lock to themselves.

This feature is only available if all servers in the site are running the same version of the ACC Server software.



PTZ Presets, Patterns, and Tours

Pan, Tilt, Zoom (PTZ) cameras can be controlled through the image panel on-screen controls or by using the tools in the PTZ Controls pane.


Some tools and features may not be displayed if they are not supported by your camera.

Note: For video analytics devices, classified object detection and analytic events only work when the camera is in its Home position.



Accessing the PTZ Controls Pane

1. In the top-right corner of the View toolbar, click .
2. In the bottom-right corner of the image panel, click .

Adding a PTZ Preset

1. Move the camera's field of view into position.
2. In the **Presets** drop-down list, select a number then click .
3. In the dialog box, enter a name for the preset.
4. Select the **Set as home preset** checkbox if you want this to be the camera's Home preset.
5. Click **OK**.






Adding a PTZ Pattern

1. In the PTZ Controls pane, select a pattern number and click .
2. Use the PTZ controls to move the camera and create the pattern.
3. Click  to stop recording the pattern.





Adding a PTZ Tour

If supported, tours allow the PTZ camera to automatically move between a series of preset positions. You can set tours to pause at each preset for a specific amount of time for video monitoring.



1. Create all the PTZ presets you need for this tour.
2. In the PTZ Controls pane, select a tour number then click . The Edit PTZ Tour dialog box is displayed.
3. Give the tour a name.
4. In the **Tour Pause Duration:** field, enter the amount of time before the tour repeats. Tours repeat until manually stopped, or until other PTZ controls are used.
5. In the **Tour Mode:** drop-down list, select one of the following:
 - **Sequential:** the PTZ camera will go to each preset in the set order.
 - **Random:** the PTZ camera will go to each preset in random order.
6. Select the **Set as default tour** checkbox if you want this tour to run automatically.
 - The **Default Tour Idle Start Time:** field is now enabled. Enter the amount of time the PTZ camera must be idle before this tour automatically starts.
7. To add a preset to the list, click .
 - a. In the **Preset** column, select a preset from the drop-down list.
 - b. In the **Move Speed** column, enter how fast you want the PTZ camera to move to this preset. The higher the %, the faster the camera moves.
 - c. In the **View Time** column, enter the amount of time you want the PTZ camera to stay at this preset position. The view time is 10 seconds by default.
 - d. Repeat this step until all the presets for the tour have been added.
8. To remove a preset, select the preset then click .
9. To re-order a preset, select the preset then click  or . The preset order only affects tours that use Sequential mode.
10. Click **OK** to save the tour.

Activating a Preset, Pattern, or Tour

- Select a preset, then click .
- Select a pattern or tour number, then click .



Using the H4 IR PTZ Wiper

1. In the View tab, click  in the toolbar to enable PTZ controls.
2. In the bottom-right corner of the image panel, click .
3. Click **Aux**.

The camera wiper will run.

Tip: You can also use the camera web interface or set up a rule to start an Auxiliary PTZ action when a digital output is triggered in the ACC Mobile 3 application. For more information, see the camera web interface guide on help.avigilon.com or *Adding a Rule* on page 1.



Live Monitoring

Use configured features to monitor your site effectively.

Note: Some features are only available if the site has the required license, and if you have the required user permissions.

Focus of Attention

FOR ENTERPRISE EDITION

The Focus of Attention tab gives you a high-level overview of all sites and cameras you have access to.

- In the New Task menu , click  **Focus of Attention**.

If selected in the settings, active alarms are displayed and cameras are highlighted in red until the alarm is acknowledged.

As new alarms and events occur, the video appears in the Recent Events list and the corresponding camera changes color in the Overview.

The Overview

The Overview provides an abstract view of your System Explorer. Each hexagon represents a camera grouped by sites and folders. The cameras follow the order of the System Explorer from left to right and change color in response to events.

The camera color indicates the following:

- **Red** — Alarms
- **Yellow** — Face Watch List Matches, People Without Masks, License Plate Matches or Unusual Activity Detection
- **Teal** — Video Analytic Detection or Unusual Motion Detection
- **Blue** — Motion Detection
- **Green** — Highlights the camera displayed in the Recent Events list
- **Gray** — No event
- **Colorless** — Camera offline



Zooming and Panning the Overview

If you have many cameras or sites, you can zoom in and out of the Overview to pay attention to areas of interest.



- Scroll your mouse to zoom.
- Hold Ctrl and click and drag your mouse to pan.

You can also use the controls in the lower-right corner.

-  — Displays the Overview zoom and position controls.
-  — Centers the System Explorer.


Tip: Drag the Overview to a separate monitor to view Featured Event video and the Overview at the same time.

Changing Focus of Attention Settings

The Focus of Attention Settings dialog box is displayed when you first open the Focus of Attention tab. These settings only affect what the Recent Events list displays.

1. Select the events and cameras you want to view.
2. Click **OK**.

Your settings are saved.

To edit these settings later, in the top-right corner of the Recent Events list, click .

Monitoring Events





To view video:

- Double-click a camera in the Overview.
- Hover over an event in the Recent Events list and click **Replay** or **Go Live**.

To return to the Overview:

- Double-click the Overview in the bottom-right corner.

The following options are available when you hover over an image panel.

Icon	Description
	Shares the event video with a selected user.
	Opens the event video in a new tab.
	Bookmarks the event.
	Clears the image panel.



3. In the displayed panels, the Alarm Triggers box lists each time the alarm was triggered while the alarm was active. For Face Watch List Match alarms, select a timestamp to view video from a specific trigger.
4. In the displayed panels, depending on the current state of the alarm, select one of the options.
 - **Acknowledge** — Marks the alarm as being viewed and acknowledged.
 - **Assign Alarm** — Assigns the alarm to yourself.
 - **Unassign Alarm** — Removes the alarm assignment from yourself.
 - **Purge Alarm** — Clears the alarm and removes the status.
 - **Open In View** — Plays alarm video in a new View.
 - **Bookmark Alarm** — Saves the alarm within the system.

Identity Verification

FOR STANDARD AND ENTERPRISE EDITION

Note: To use this feature, your ACM identity must be imported into the ACC software and have the appropriate ACM permissions. Contact your ACM administrator to update your permissions.

If your camera is linked to a door in the ACM appliance, you can monitor authorized and unauthorized door activity in an adjacent image panel.

- In the top-right corner of an image panel, click  and select the door you want to monitor.

An identity verification image panel is displayed. The most recent activity is displayed at the top.

Tip: You can resize the badge photo using the slider at the top of the identity verification image panel.

When someone swipes an ACM badge, the identity verification image panel displays a card with the following information if available:

- Badge photo
- First and last name
- Date and time
- ACM door event

Compare the video to the badge photo to verify the person's identity and prevent unauthorized access.

Note: The identity verification image panel does not update while viewing recorded video or another tab.



Monitoring License Plates


FOR ENTERPRISE EDITION

While you monitor video in an image panel, you can also monitor license plates as they are detected by the system.

Enabling License Plate Overlays

When the license plate overlay is enabled, detected plate numbers are displayed in the bottom-right corner of the image panel.

To enable the License Plate overlay:

1. In the top-right corner of the ACC Client window, select  > **Client Settings > Display**.
2. In the Image Overlays: area, select the **License Plate** checkbox.
3. Click **OK**.

When you view live video for a camera that is configured for license plate recognition, the detected license plates are displayed.

Reviewing LPR Watch List Matches

If your system is configured to track specific license plates using a Watch List, you will be notified by a pop-up dialog box when matches are detected.

Select one of the license plate matches and do any of the following:

- Click **View this Event** or double-click the selected license plate to open a snapshot of the detected license plate in a new View.
- Click **Delete** to delete the license plate from the list.
- Click **Clear All** to empty the current match list. The list will be repopulated as new license plates are detected.

Monitoring POS Transactions

FOR STANDARD AND ENTERPRISE EDITION


If a camera is linked to a point of sale (POS) transaction source, you can monitor transactions while watching video from the linked camera. Each transaction is separated by date and time, with the most recent transaction highlighted in blue.

1. In the top-right corner of the image panel, click .
2. Select a POS transaction source, then click **OK**. Transactions will display in the next image panel.

Tip: Review previous transactions by hovering on the transaction image panel and scrolling up.



Displaying Cameras Linked to POS Sources

1. Click  in the POS transaction image panel.
2. Select a camera, then click **OK**.

Browsing the ACM Appliance in the ACC Client

FOR STANDARD AND ENTERPRISE EDITION

If a web page for an ACM appliance was configured, ACC operators can access it in the ACC Client software.

Click and drag **URL** from the System Explorer to an image panel.

The web page will display in that image panel.

- ACC operators logged in with their ACM credentials will automatically be logged in to the ACM appliance.
- ACC operators without ACM credentials may see a certificate warning when they first open the web page. Click **Trust** to continue to the log in page.

Note:


If the ACM session times out, operators will need to log in again.

- ACC operators logged in with their ACM credentials will automatically be logged in again when they close the dialog box.
- Administrators can change an operator's timeout settings in the ACM appliance.

Using a Map

FOR STANDARD AND ENTERPRISE EDITION

You can open a map in any image panel, then view video or alarms by interacting with the map.

1. To open a map in an image panel, double-click  in the System Explorer.
2. When the map appears in an image panel, do any of the following:



To...	Do this...
Review an alarm	When a camera flashes red, an alarm linked to the camera has been triggered. <ul style="list-style-type: none">Click the camera to monitor the live alarm video.
Display video from a camera on the map	<ul style="list-style-type: none">Click the camera on the map.
Display a preview of the video from a camera	<ul style="list-style-type: none">Hover over a camera in the System Explorer or on the map.
Open a linked map	<ul style="list-style-type: none">Click the map icon on the map. <p>You can use the Forward and Back buttons to move between maps.</p>
Open a linked View	<ul style="list-style-type: none">Click the saved View on the map.

Opening a Web Page

FOR STANDARD AND ENTERPRISE EDITION

If your System Explorer contains web pages for quick access to your ACM appliance or related to your surveillance system configured, you can access them in the View tab.

Click and drag **URL** from the System Explorer to an image panel.

The web page will display in that image panel.



Paused Video

FOR STANDARD AND ENTERPRISE EDITION

An image panel will stop recording and streaming video and display **Paused** if:

- A device is in Standby mode. For more information, see *Configuring Standby Mode* on page 1.

An image panel will display **Standby** if:

- A device connection is lost and it is in failover state. For more information, see *Failover Connections* on page 1.
- An encoder without any camera sources is viewed.



CROSSTALK SOFTWARE

CROSSTALK CLOUD SOFTWARE

CrossTalk cloud software allows you to monitor and control one or multiple CrossTalk units that control school zone signs, message boards, navigational beacons, and aviation beacons. CrossTalk maximizes your time by allowing you to schedule, receive notifications, and manage multiple beacons in multiple locations using any internet connected device. The CrossTalk device constantly monitors your units. Notifications via text and/or email are sent when CrossTalk detects conditions such as:

- Low Battery Voltage
- Low Solar Voltage
- An Outage

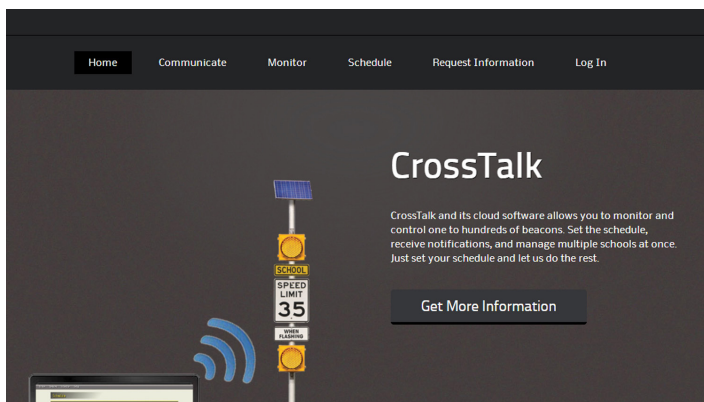
CROSSTALK ONLINE MANUAL

To start using the CrossTalk online options, access the login page located at: <http://www.kkCrossTalk.com/>

In the main menu of the website you will see six quick link tabs including the login tab on the right side. These tabs have detailed information on how the CrossTalk operates and how it communicates through both internet (long range) and radio (short range).

Upon accessing the login tab, you will be taken to a new screen that prompts you to enter a username and password that is provided by K&K Systems. Below is the link to quickly access the login screen without going through the homepage.

<http://www.kkCrossTalk.com/XTLOGIN.php>



LOCATIONS



LOCATIONS

The **Locations** menu is the default page upon login. The available units are listed in the window. The default name of each unit will be displayed. However, the names can be changed at any time to specify units or to better locate them.

DESCRIPTION

In the **Description** column the information can be edited for details that will differentiate that device from others in the same area.

DEVICE ID/IP/PORT

The **Device ID/IP/Port** column displays the information used to communicate to the device via the online server. Although the information can be edited, it should **not** be changed unless needed for changing units or IP settings. Please contact of a K&K Systems Customer Representative to assist in the event changes need to be made.

SCHEDULE PROFILE

The **Schedule Profile** column allows the user to set/change schedules of each unit. Most units will use the same schedule if they are in the same Group (*i.e.*: school zone). If different schedules are required, create a new schedule and select the specific units that will use that schedule.

STATUS ICON

The status icon provides a quick link to see the condition of each unit's components functioning status. Click the icon to inspect Lights/Beacons, Battery Voltage, Solar Voltage, Date, Time, Group, Net Address, Last Schedule, and number of times the Modem has reset itself.



CROSSTALK SOFTWARE

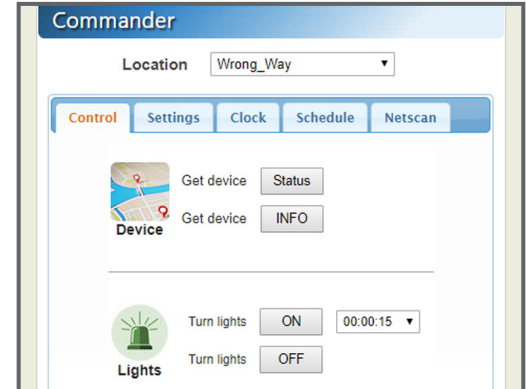
COMMANDER

The **Commander** tab in the CrossTalk main menu provides access to units.

CONTROL

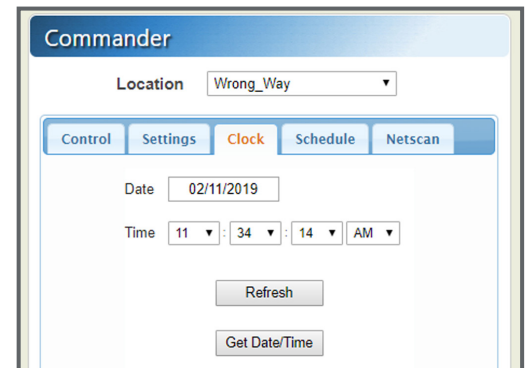
Access to the devices for:

- **Status:** summary of functions
- **INFO:** detailed summary of specific elements of the unit such as Hardware, Firmware, Device ID, Date, Time, and Modem Reset Count
- **Turn Lights ON:** manually activate lights for a set time from 5 minutes to 2 hours. Primarily used for troubleshooting or special requirements. Lights automatically turn off after the duration.
- **Turn Lights OFF:** manual control to deactivate.



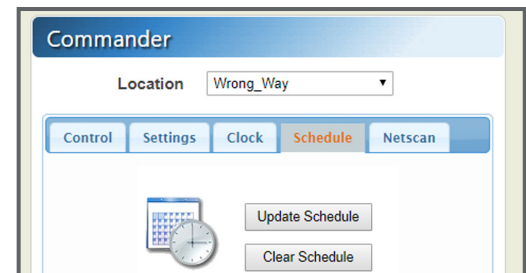
CLOCK

The **Clock** accesses the date and time. The date and time shown should match that of the device being used to access the server. The **Set Time/Date** button can be used to change the time sending the correct date and time to the CrossTalk in such cases as Daylight Savings time change. *Always set your time upon delivery of your system.*



SCHEDULES

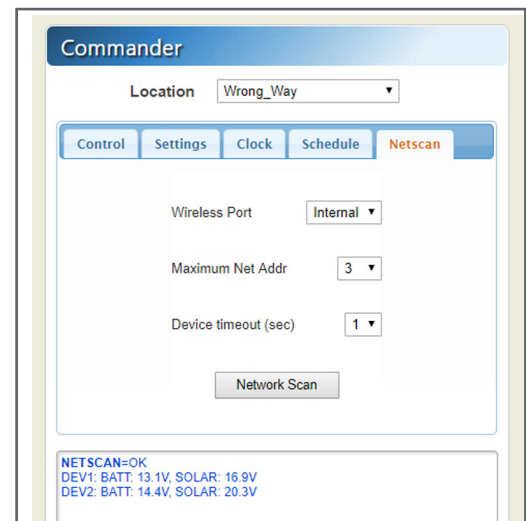
To change schedules click the **Schedules** tab. Select the schedule to be updated by clicking the corresponding box. The default is the **All** option. Click the **Update Schedules** button. *Before updating all Schedules to the CrossTalk, it is recommended that the previous schedules on all units in a group be cleared.*



NETWORK

This window gives the user the ability to communicate from the web-based server to master unit(s) and the surrounding units. Utilizing radio communication, the CrossTalk does not have the ability to communicate directly to the Server. By using the (radio) short range (900Mhz), the master CrossTalk access the other units in the Group and send a status message back to the server for the user to review.

To use the Network tab, select the **Location** (i.e.: Master) at the top and then select the **Maximum Net Address** (default: 3) and the **Device Time Out** (default: 1 second). When communicating with only 1 other CrossTalk, the default (3) should be left as is. *This can be increased or decreased depending on how many.*



NETWORK SCAN

Click the Network Scan button after selections are made. As the CrossTalk communicates with other local CrossTalks, the status of each device that has been contacted is displayed in the lower window. The first number following DEV is the Group number set on the device whereas the second number will be the Net Address that is also set on the device by dial. (i.e.: DEV00, DEV01, DEV02, DEV03). The Status shown in the Network Scan will list the Battery Voltage, Solar Voltage, and status of the lights if on or off.



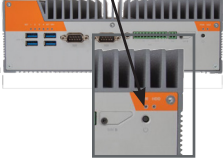
PARTS LIST

PART #	DESCRIPTION	OPTIONAL COMPONENTS	
SIGN ALERT COMPONENTS		SADG	Diamond Grade Reflective Sheeting
W10-1-4848-HI-6-D20	Sign Alert with 6 LEDs	PA-17-40	Spun Aluminum Pole - 17'
FAMUTCDCKIT	Hardware Kit	PA-20-40	Spun Aluminum Pole - 20'
MEZ32111614A	Z-Bracket	PA-C-40	Spun Aluminum Pole - Custom Lengths Avail.
CCTR-12 4-1/2"	Spun Aluminum Pole Kit with Base		
PA-15-40	Spun Aluminum Pole - 15'	LPV-150-12	150W 12V Power Supply for 220V Systems
PB-BAS-1-PX	Pole Base	ASC-L-CAM	Cellular Service Plan (number of years options)
DB-4-48	Drive Base		
CTR-PC	Pole Collar		
PAC-1	Pole Cap		
DETECTION COMPONENTS			
640S-H4A-THC-B050	Thermal Camera		
640S-H4A-THC-B024	Thermal Camera		
4.0C-H5A-B01-IR	IR Camera		
3.0C-H4A-25G-B01-IR-B	IR Camera with Server		
SS400	Doppler Radar		
CONTROLLER COMPONENTS			
KK-700PC	Built for Camera Server with Cell Modem		
CROSSTALK-CW-10	CrossTalk CW10 Controller		
CROSSTALK-CW-4	CrossTalk CW4 Controller		
CROSSTALK-SERVICE	CrossTalk Cellular Service Plan - 1 Year		
SOLAR COMPONENTS			
BAT-SW-12	Battery Switch		
BAT-12-100A	100 Amp Batteries		
BAT-12-55A	55 Amp Batteries		
BAT-12-18A	18 Amp AGM Battery		
DS-A1-120	120 Watt Solar Panel		
DS-A1-110	110 Watt Solar Panel		
DS-A1-100	100 Watt Solar Panel		
DS-A1-20	20 Watt Solar Panel		
DS-A1-10	10 Watt Solar Panel		
DS-A1-5	5 Watt Solar Panel		
SMSP-80	Solar Side Mount		
SMT-80	Solar Top Mount		
CC-SOLAR30	Solar Charger		
LPVL-150-12	150W 12V Power Supply for 120V Systems		
KKMBRK	Breaker		
STS-8Position	Terminal Strip		
CABINETS			
KKSL403615D	15x36x40 Power Bank Aluminum Cab.		
KKSL401609	9X16X40 Box		
KKSL401615	15x16x40 Box		
KKSL402415	15x24x40 Box		
ECO1-110704	Eco-Cabinet		



TROUBLESHOOTING GUIDE: CAMERA SYSTEMS

Please call 888-414-3003 for Tech Support if this guide does not solve your issue.

PROBLEM						
	PC Not Working <i>Must be on-site to troubleshoot</i>	Battery keeps dying	Camera Blank	Connection Drops	Vehicle Detection Fails	Red X Next to Site Location Login <i>Must be on-site to troubleshoot</i>
STEP 1	<ul style="list-style-type: none"> Check that power connections are secure 	<ul style="list-style-type: none"> Check Battery Level, Must be at least 12V. If not, charge to proceed with troubleshooting. Load test battery. A bad battery will not hold a charge. 	Remote Action: <ul style="list-style-type: none"> Make sure the connection speed is set to WAN in Avigilon Control Center Software under Client Setting under Site Networking 	Remote Action: <ul style="list-style-type: none"> Restart server 	On-Site Action: <ul style="list-style-type: none"> Check that detection zone is free from obstructions. 	On-Site Action: <ul style="list-style-type: none"> Check the network connection cables are secure
STEP 2	<ul style="list-style-type: none"> Check Battery Level. Must be at least 12V. If not: Charge or replace 	If the solar voltage is negative, the polarity is backwards: <ul style="list-style-type: none"> Switch the position of the wires and check the polarity again. If voltage is positive: <ul style="list-style-type: none"> Reinstall wires 	Remote Action <ul style="list-style-type: none"> Restart the server 	On-Site Action: <ul style="list-style-type: none"> Check that antenna connections are secure 	If there are obstructions: <ul style="list-style-type: none"> Remove obstructions if possible. If not, then relocate the wrong way system to a clear zone. 	On-Site Action: <ul style="list-style-type: none"> Restart server by holding the power button for 10 seconds. 
STEP 3	If the battery level is 12V: <ul style="list-style-type: none"> Please call K&K Systems 	If voltage is low or none: <i>Depending on the time of day it may be low. Dusk or Dawn will produce low voltage.</i> <ul style="list-style-type: none"> Check voltage at the connection behind the panel and at the end of the wires. They must match. If different, the wires are bad: <ul style="list-style-type: none"> Replace and retest. 	If problem persists: <ul style="list-style-type: none"> Please call K&K Systems 	Remote Action: <ul style="list-style-type: none"> Adjust the motion sensitivity 	If no obstructions: <ul style="list-style-type: none"> Adjust camera angle to point at traffic 	If problem persists: <ul style="list-style-type: none"> Please call K&K Systems
STEP 4		Is the solar panel facing south and the sunlight unobstructed? If it is not, charging efficiency is decreased and the battery charges slowly: <ul style="list-style-type: none"> Check the solar panel direction with a compass. Clear trees so solar panels have full sun exposure. 		If problem persists: <ul style="list-style-type: none"> Please call K&K Systems 	Remote Action: <ul style="list-style-type: none"> Adjust the motion sensitivity 	
STEP 5		If problem persists: <ul style="list-style-type: none"> Please call us 			If problem persists: <ul style="list-style-type: none"> Please call K&K Systems 	



TROUBLESHOOTING GUIDE: RADAR SYSTEM

Please call 888-414-3003 for Tech Support if this guide does not solve your issue.

PROBLEM				
	Lights will not flash	Battery keeps dying	ERROR=Timeout Message = No response from remote device	Device ID Error
STEP 1	<ul style="list-style-type: none"> • Check Battery Level. Must be at least 12V. <p>If not:</p> <ul style="list-style-type: none"> • Charge the battery to proceed with troubleshooting. 	<ul style="list-style-type: none"> • Check Battery Level, Must be at least 12V. If not, charge to proceed with troubleshooting. Load test battery. A bad battery will not hold a charge. 	<ul style="list-style-type: none"> • Repeat attempt to get the status. <i>Occasionally the CrossTalk will not connect on the first attempt.</i> 	<p>Under Device ID/ Port:</p> <ul style="list-style-type: none"> • Check that Device ID matches the CrossTalk you want to communicate with
STEP 2	<p>If battery is at 12V:</p> <ul style="list-style-type: none"> • Is the battery light on? <p>If the battery light is not on:</p> <ul style="list-style-type: none"> • Check for a blown fuse in the CrossTalk. (See pages 20-21). • Check polarity of battery wires. 	<p>If the solar voltage is negative, the polarity is backwards:</p> <ul style="list-style-type: none"> • Switch the position of the wires and check the polarity again. <p>If voltage is positive:</p> <ul style="list-style-type: none"> • Reinstall wires 	<p>If no connection:</p> <ul style="list-style-type: none"> • Go check the CrossTalk • Confirm Wireless Light is ON 	<p>If ID does not match:</p> <ul style="list-style-type: none"> • Please call us
STEP 3	<p>If battery light is on:</p> <ul style="list-style-type: none"> • Check if the Status Light is flashing? <i>The status light indicates that the signs should be flashing.</i> <p>If the Status Light is flashing:</p> <ul style="list-style-type: none"> • Check the connections to the signs. Try both outputs for the direction you're using. 	<p>If voltage is low or none:</p> <p><i>Depending on the time of day it may be low. Dusk or Dawn will produce low voltage.</i></p> <ul style="list-style-type: none"> • Check voltage at the connection behind the panel and at the end of the wires. They must match. <p>If different, the wires are bad:</p> <ul style="list-style-type: none"> • Replace and retest. 	<ul style="list-style-type: none"> • Confirm antennas are on tight. • Short Antenna, White wire on the left. (Cell, only applies to Primary units) • Large Antenna, black wire, on the right. (900Mhz) 	<p>Under Device ID/ Port:</p> <ul style="list-style-type: none"> • Check that Device ID matches the CrossTalk you want to communicate with
STEP 4	<p>If the Status Light is not flashing, Radar's green light is flashing and vehicles are passing:</p> <ul style="list-style-type: none"> • Make sure the radar is aimed correctly. <i>In a sequential configuration, if the first unit in curve does not flash, the rest will not flash either.</i> 	<p>Is the solar panel facing south and the sunlight unobstructed? If it is not, charging efficiency is decreased and the battery charges slowly:</p> <ul style="list-style-type: none"> • Check the solar panel direction with a compass. • Clear trees so solar panels have full sun exposure. 	<p>If Antennas are on correctly:</p> <ul style="list-style-type: none"> • Open up the CrossTalk and ensure the SIM card is seated correctly, clean and undamaged <p>If problem persists:</p>	<p>If ID does not match:</p> <ul style="list-style-type: none"> • Please call us
STEP 5	<p>If still no connection:</p> <ul style="list-style-type: none"> • Call K&K with any questions about mode adjustments and if your lights will not flash. 	<p>If problem persists:</p> <ul style="list-style-type: none"> • Please call us 	<p>If you still cannot connect:</p> <ul style="list-style-type: none"> • Please call us 	

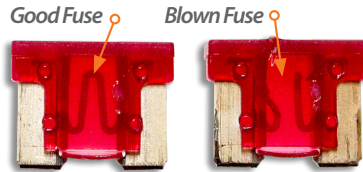


CROSSTALK FUSE LOCATION & REPLACEMENT

Access the CrossTalk components by removing the CrossTalk from the control box.

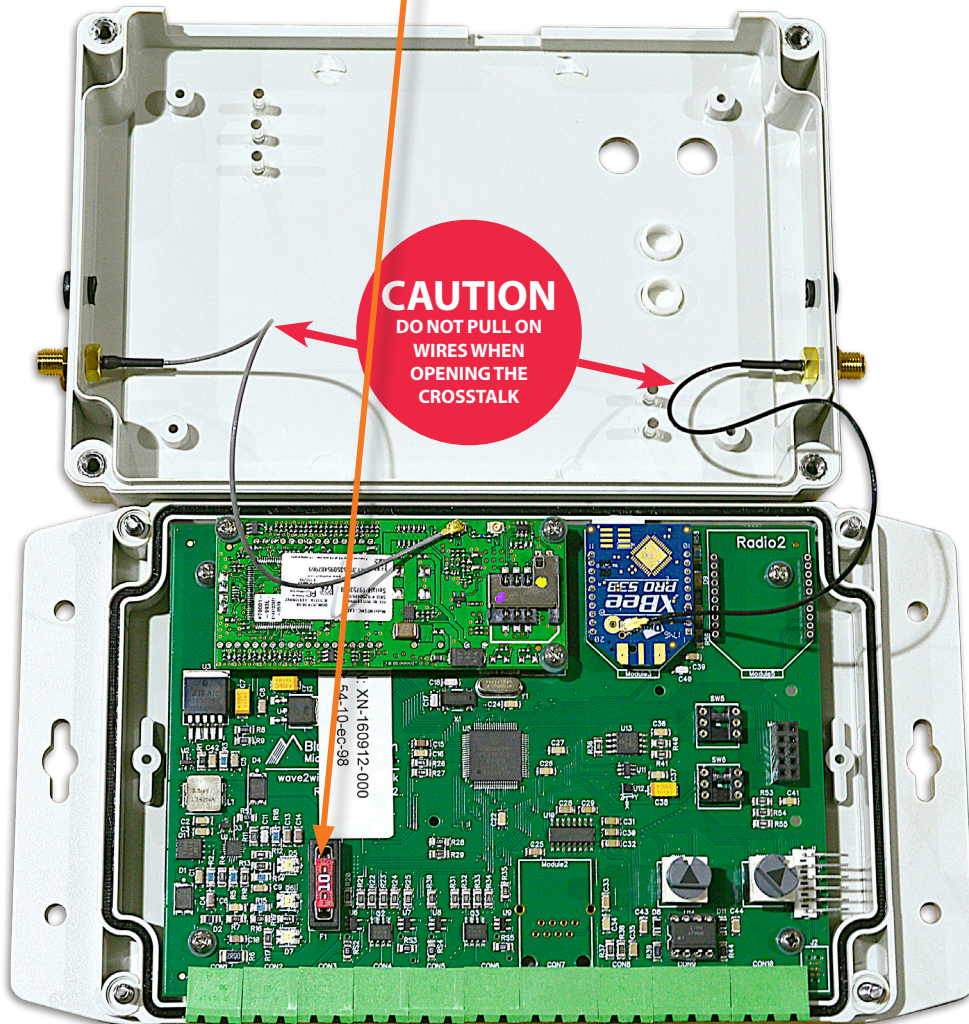
1. Turn the CrossTalk onto the face to reveal 4 screws on the backside of the housing on the corners.
2. Loosen each screw until the face cover easily separates from the back of the housing. The screws will remain in the housing.
3. Carefully lay the cover over as to not to break the connection of the aerial wire.
4. Locate the 10 amp Low Profile Mini Fuse at the bottom left of the control panel.
5. Remove the fuse by grasping with fingers and gently rocking the fuse side to side.

6. Inspect the fuse by looking through the translucent housing at flat wire in the center. If the wire is solid, the fuse is good. In a blown fuse, the wire will be broken.



Low Profile Mini Fuse

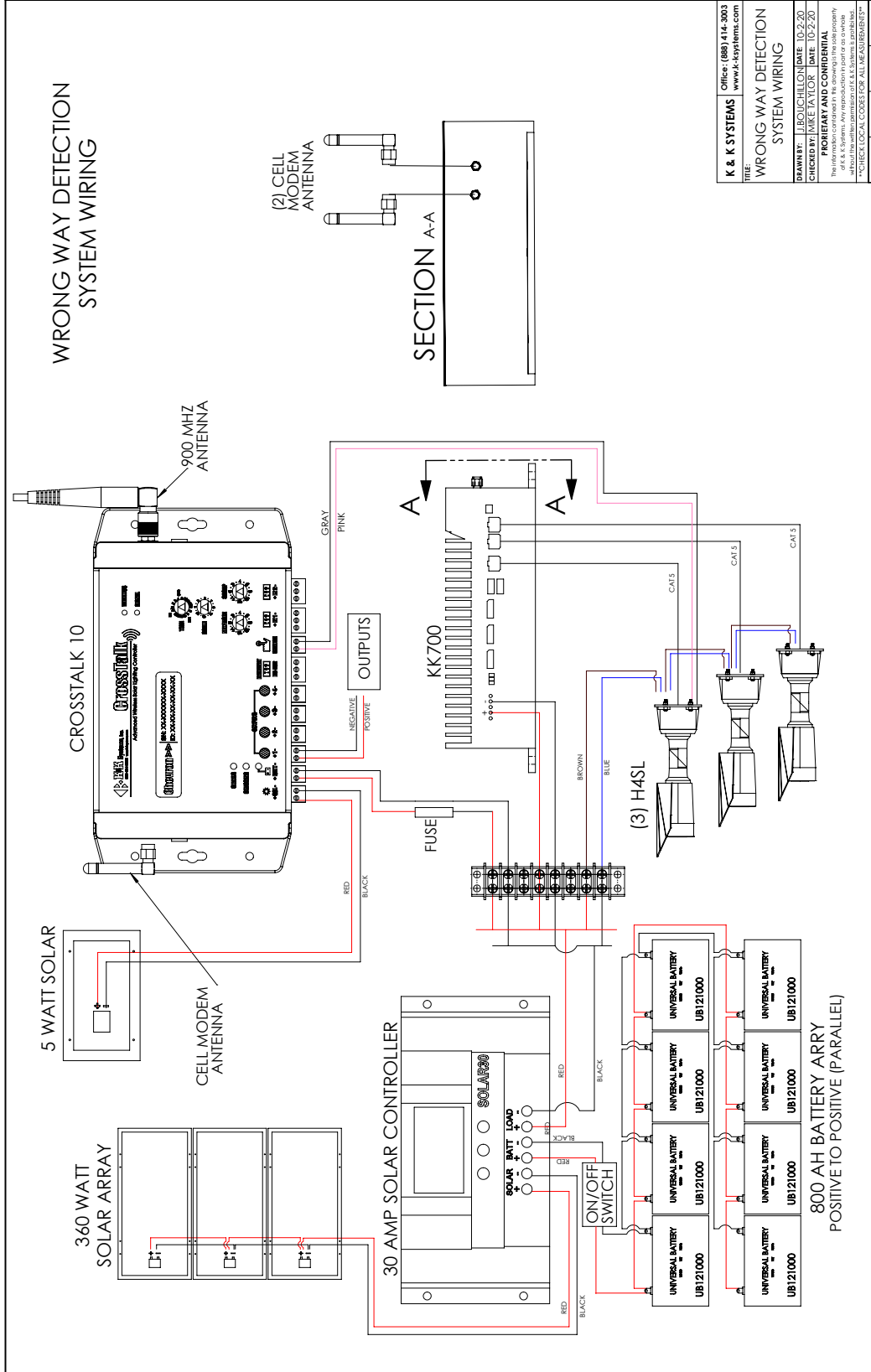
7. Replace the blown fuse with a new one by inserting into the port and firmly pressing it into place.
8. Align the covers and twist the screws until the covers are snug.
9. Remount the CrossTalk to control box.





WIRING DIAGRAM SOLAR POWERED

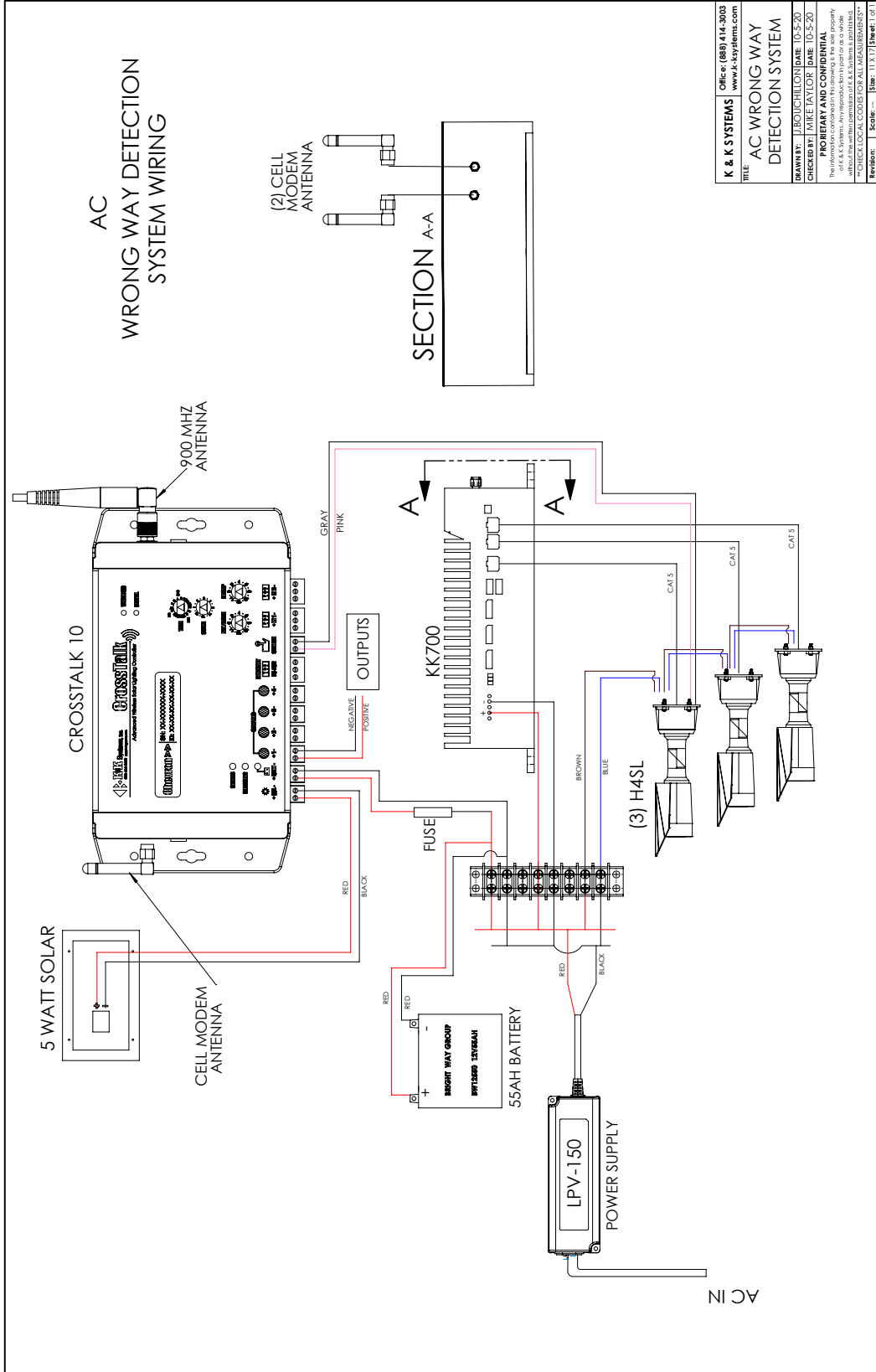
WRONG WAY DETECTION SYSTEM WIRING



K & K SYSTEMS	Office: (888) 414-3003 www.k-k-systems.com
TITLE:	WRONG WAY DETECTION SYSTEM WIRING
DRAWN BY: J. ROULCHILON	DATE: 10-2-20
CHECKED BY: MIKE TAYLOR	DATE: 10-2-20
PROPRIETARY AND CONFIDENTIAL	
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CHECK LOCAL CODES FOR ALL REQUIREMENTS	
Revision:	Page: 11 of 17 Sheet: 1 of 1



WIRING DIAGRAM AC POWERED

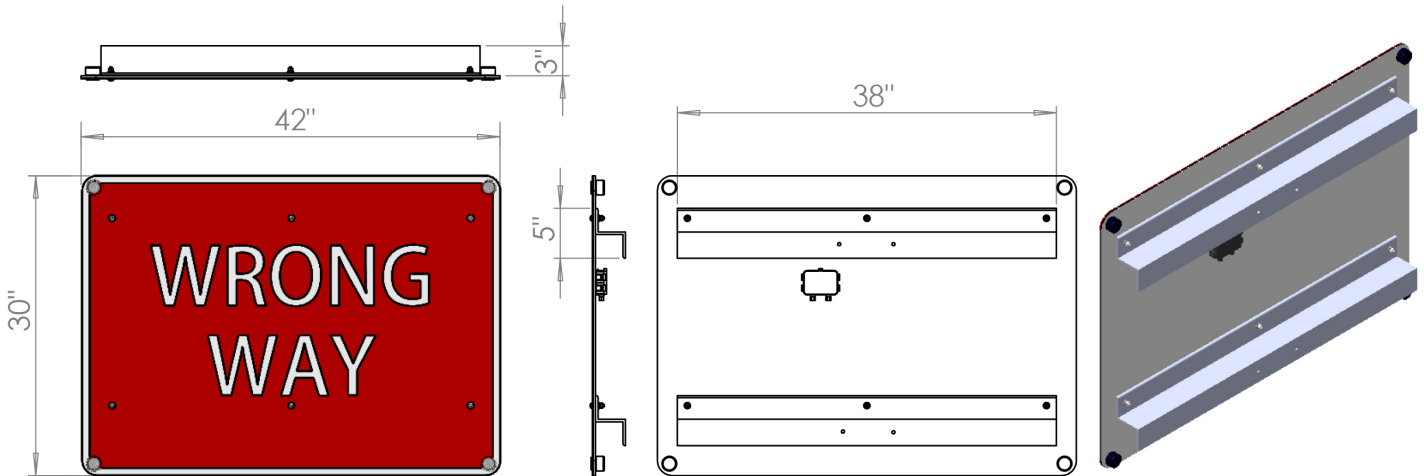




SIGN MOUNTING ASSEMBLY

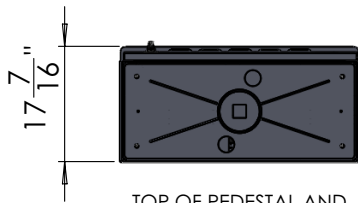
ITEM NO.	PartNo	DESCRIPTION	QTY.
1	CTR-UBS	6168 4.5" O.D. Pole Mount Sign Mount U BOLT pair	1
2	PP-15-40	15' Aluminum Pole SCH 40 (36402)	1
3	FAHN1420SS	1/4-20 "NC" FINISHED HEX NUT 18-8 SS	6
4	FALW14SS	1/4 LOCK WASHER	6
5	MEZ32111614A	3" x 2 11/16" x 1/4" Z BAR	2
6	FAFW1458SS	1/4X5/8 FLAT WASHER 18-8 SS	12
7	FAHB14201SS	1/4-20 X 1 HEX BOLT	6

K & K SYSTEMS	Office: (888) 414-3003 www.k-systems.com
TITLE: WW-SP-2 SIGN ALERT MOUNTING	
DWG. NO.	
DRAWN BY: J. BOUCHILLON	DATE: 11-19-20
CHECKED BY: MIKE TAYLOR	DATE: 11-19-20
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CHECK LOCAL CODES FOR ALL MEASUREMENTS	
Revision:	Scale: --- Size: 8.5 X 11 Sheet: 1 of 1

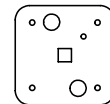
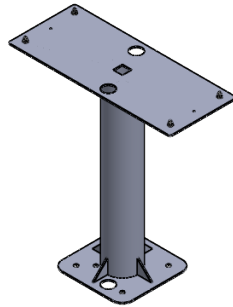




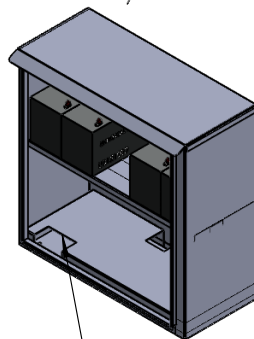
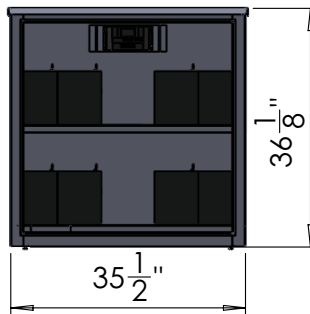
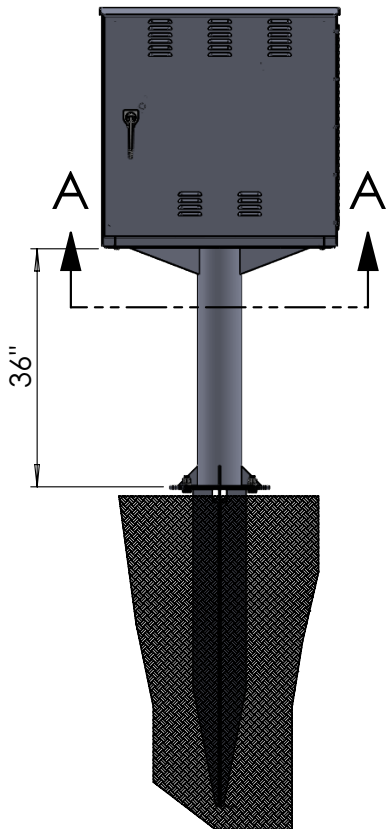
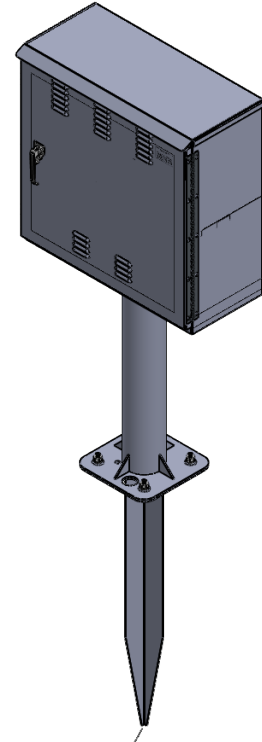
POWER PACK CABINET



TOP OF PEDESTAL AND
BOTTOM OF CABINET
A-A



OPTIONAL
MODIFIED
DRIVE BASE
PLATE



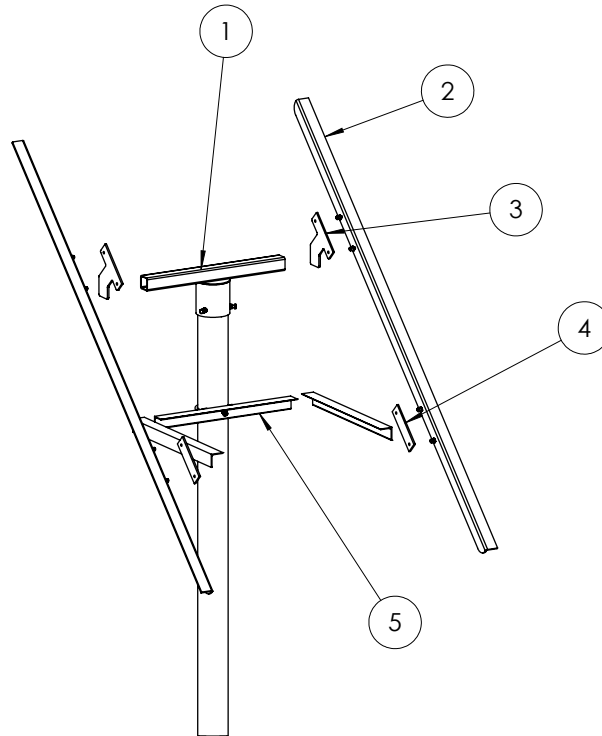
REMOVABLE TRAY

K & K SYSTEMS		Office: (888) 414-3003 www.k-systems.com	
TITLE:			
SOLAR POWER PACK			
DRAWN BY:	J. BOUCHILLON	DATE:	9-11-20
CHECKED BY:	MIKE TAYLOR	DATE:	9-11-20
<p>PROPRIETARY AND CONFIDENTIAL</p> <p>The information contained in this drawing is the sole property of K & K Systems. Any reproduction in part or as a whole without the written permission of K & K Systems is prohibited.</p> <p>**CHECK LOCAL CODES FOR ALL MEASUREMENTS**</p>			
Revision:	Scale: --	Size: 8.5 X 11	Sheet: 1 of 1



SOLAR MOUNTING ASSEMBLY

ITEM NO.	PartNo	DESCRIPTION	SHEET #	QTY.
1	MET22231218	2" X 2" X 23 1/2" X 1/8" TUBE	SHEET #2	1
2	MEA22791818	2" X 2" X 79 1/8" X 1/8" STEEL ANGLE	SHEET #3	2
3	MES7714	7" X 7" X 1/4" SHEET	SHEET #4	2
4	MES7214	7" X 2" X 1/4" SHEET	SHEET #5	2
5	MEA2231418	2" X 2" X 23 1/4" X 1/8" STEEL ANGLE	SHEET #6	3



K & K SYSTEMS	Office: (888) 414-3003 www.k-systems.com	
TITLE: SOLAR MOUNT		
DWG. NO. FOR WRONG WAY		
DRAWN BY: Timothy P.	DATE: 1-19-21	
CHECKED BY: Mike Taylor	DATE: 1-19-21	
PROPRIETARY AND CONFIDENTIAL		
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CHECK LOCAL CODES FOR ALL MEASUREMENTS		
Revision:	Scale: 1:20	Size: 8.5 X 11 Sheet: 1 of 6



WRONG WAY SYSTEMS SPECIFICATIONS

WRONG WAY SYSTEMS WITH AMP DRAW						
MODEL	WWS-AC-1	WWS-AC-2	WWS-AC-3	WWS-AC-4	WWS-AC-5	WWS-AC-6
DESCRIPTION	Full System w/Thermal	Thermal Only	2 Camera System	1 Camera System	Radar Activated	Wrong Way
THERMAL	0.28	0.28				
COMPUTER/M	0.85	0.85				
SWITCH			0.28			
MODEM			0.14	0.14		
RADAR					0.05	
CT-CW-10	0.06	0.06	0.06	0.06	0.06	
CT-4						0.06
IR-CAMERA	0.6					
IR-CAMERA	0.6					
CAMERA/WM			0.6			
CAMERA/WM			0.6	0.6		
TOTAL	2.39	1.19	1.68	0.8	0.11	0.06
24 HR	57.36	28.56	40.32	19.2	2.64	1.44

WRONG WAY SYSTEMS WITH SOLAR PACK						
MODEL	WWS-SP-1	WWS-SP-2	WWS-SP-3	WWS-SP-4	WWS-SP-5	WWS-SP-6
DESCRIPTION	Full System w/Thermal	Thermal Only	2 Camera System	1 Camera System	Radar Activated	Wrong Way
BATTERIES	(8) 100 amps	(4) 100 amps	(5) 100 amps	(3) 100 amps	(2) 18 amps	(1) 18 amp
SOLAR WATT	360	200	240	110	20	10
BATTERY / C	1	1	1	1		
CONTROL / C	1	1	1	1		
SOLAR / C					1	1
SOLAR / MOUNT	1	1	1	1		

WRONG WAY SYSTEMS WITH SOLAR PACK						
MODEL	WWS-M-1	WWS-M-2	WWS-M-3	WWS-M-4	WWS-M-5	WWS-M-6
DESCRIPTION	Full System w/Thermal	Thermal Only	2 Camera System	1 Camera System	Radar Activated	Wrong Way
DRIVE / B	3	2	3	2	1	1
BASE	1	2	2	2	1	1
POLE 17'	1	1	1	1	1-15	1-15
POLE 15'		1	1	1		
COLLAR / P						



KK700PC COMPUTER SAFETY/COMPLIANCE

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REGULATORY COMPLIANCE AND SAFETY INFORMATION

This document provides international regulatory and safety compliance information for the Logic Supply Rugged Fanless PC model K700 computer system. This information also covers models xxxxxK700xxxxxxxxxxxxxxxx (where x is any alphanumeric character, "-" or blank designating configuration differences).

SAFE USE AND INSTALLATION INSTRUCTIONS

1. Do not open or modify the device. The device uses components that comply with FCC and CE regulations. Modification of the device may void these certifications.
2. Install the device securely. Be careful handling the device to prevent injury and do not drop.
3. Wall or ceiling mounting device requires use of a mounting plate or bracket. Plate or bracket must be of metal construction and have a minimum thickness of 1mm.
4. Use M4x0.5mm Flat Head screws to attach mounting plate or mounting brackets to threaded holes on bottom or rear of chassis. Screws should be minimum length of 4mm. Add 1mm of screw length for every mm of additional thickness of plate or bracket beyond 1.5mm.
5. Ambient operating temperature must be between -40 °C to 70 °C with a non-condensing relative humidity of 10-90%. Operational temperature is dependent on component selection including power adapter. See Table 1 below for derating.
6. The device can be stored at temperatures between -40 °C to 85 °C.
7. Keep the device away from liquids and flammable materials.
8. Do not clean the device with liquids. The chassis can be cleaned with a cloth.
9. Allow at least 2 inches of space around all sides of the device for proper cooling. If device is mounted to vertical surface then recommended device orientation is so that heatsink fins allow air to rise unobstructed. Alternative orientations may result in reduced operational temperature range.
10. This device is intended for indoor operation only.
11. Use UL Listed external power supply with rated output 9-48 Vdc.
12. Install the device only with shielded network cables.
13. Service and repair of the device must be done by qualified service personnel. This includes, but is not limited to, replacement of the CMOS battery. Replacement CMOS battery must be of the same type as original.
14. Proper disposal of CMOS battery must comply with local governance.

WARNING: There is danger of explosion if the CMOS battery is replaced incorrectly. Disposal of battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.



KK700PC COMPUTER SAFETY/COMPLIANCE

Table 1 - Operational Temperature rating by Included power adapter

Power Adapter Model	Description	Operating Temperature
GST280A24	24Vdc, 11.67A AC/DC Switching Adapter	-30 to 70°C
GST160A20	20Vdc, 8A AC/DC Switching Adapter	-30 to 70°C
GST120A20	20Vdc, 6A AC/DC Switching Adapter	-30 to 70°C
No Adapter	---	-40 to 70°C

Declaration of Conformity

FCC

This device complies with part 15 of the FCC rules as a Class A device. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

ISED (Innovation, Science and Economic Development Canada)

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CE

This equipment complies with all application European Union (CE) directives if it has a CE marking. For this device to remain CE compliant, only CE compliant parts can be installed and proper cables and cabling techniques are required.

in accordance with the following Directive(s):



Electromagnetic Compatibility (2014/30/EU)
Low-Voltage (2014/35/EU)
RoHS 2 (2011/65/EU)
Radio Equipment (2014/53/EU) - Only applicable for configurations with wireless transmitters

is in conformity with the applicable requirements of the following documents:

EN 55032:2015/AC:2016 Class A
EN 55035:2017
EN 50121-3-2:2019
EN 61000-3-2:2014 Class D
EN 61000-3-3:2013
EN 61000-4-2:2009
EN 61000-4-3:2006+A1:2008+A2:2010
EN 61000-4-4:2012
EN 61000-4-5:2014+A1:2017
EN 61000-4-6:2014+AC:2015
EN 61000-4-8:2010
EN 61000-4-11:2004+A1:2017
EN 61000-6-4:2018
EN 62368-1:2014
EN 301 489-1 V2.2.0 (2017-03) Draft
EN 301 489-17 V3.2.0 (2017-03) Draft

Reports: GM219010c, GM219039c, GM219040x

I hereby declare the equipment named above has been designed and/or tested to comply with the relevant sections of the above referenced specifications. The unit complies with all applicable Essential Requirements of the Directives.

By:

Jeremy Psauté Date 2019-08-13
Jeremy Psaute
Regulatory Engineer





CAMERA SPECIFICATIONS

H4 Thermal Camera Line

VGA

QVGA



Scenes captured with H4 Thermal VGA camera.

Features



SELF-LEARNING VIDEO ANALYTICS

Detect and classify objects in challenging lighting/darkness or extreme environments such as weather, dust, debris, smoke or foliage.



HDSM SMARTCODEC™ TECHNOLOGY

Optimizes compression levels for regions in a scene to help maximize bandwidth savings, helping to keep internet connectivity costs down.



MULTIPLE LENS OPTIONS

Choose from three athermalized lens variants to optimize on-site coverage requirements.



RELAY I/O CONNECTIONS

Configure input/output actions and alarms for fast event response.



ONVIF® COMPLIANT

Built on an open platform to allow integration with other security solutions.



CAMERA SPECIFICATIONS AND CERTIFICATIONS

		QVGA	VGA				
IMAGE PERFORMANCE	Image Sensor	320x256 Uncooled VOx Microbolometer		640x512 Uncooled VOx Microbolometer			
	Pixel Pitch	12µm					
	Spectral Range	8µm to 14µm					
	Aspect Ratio	5:4					
	Imaging Rate	8.6 fps					
	Dynamic Range	-40 °C to 225 °C (-40 °F to 437 °F) [may vary based on operating temperature]					
	Resolution Scaling	320x256, can be scaled up to 640x512		640x512, can be scaled down to 320x256			
	3D Noise Reduction Filter	Yes					
	Sensitivity	NETD <60mK					
	Image Uniformity Optimization	Automatic Flat Field Correction (FFC) - Thermal and Temporal					
LENS	Lens	4.3 mm, F1.0, Athermalized	9.1 mm, F1.0, Athermalized	18.0 mm, F1.0, Athermalized	8.7 mm, F1.0, Athermalized	18.0 mm, F1.0, Athermalized	36.0 mm, F1.0, Athermalized
	Angle of View (H x V)	45.9° x 36.5°	21.6° x 17.0°	10.8° x 8.4°	50.7° x 40.4°	24.3° x 19.3°	12.2° x 9.7°
IMAGE CONTROL	Image Compression Method	H.264 (MPEG-4 Part 10/AVC), Motion JPEG					
	Streaming	Multi-stream H.264 & MJPEG					
	Bandwidth Management	Idle Scene Mode, HDSM SmartCodec Technology					
	Motion Detection	Pixel and Classified Objects					
	Tamper Detection	Yes			N/A		
	Privacy Zones	Up to 64 Zones					
	Audio Compression Method	G.711 PCM 8kHz					
NETWORK	Network	100BASE-TX					
	Cabling Type	CAT5					
	Connector	RJ-45					
	ONVIF	ONVIF® compliant with Profile S and Profile T (www.onvif.org)			ONVIF® compliant with Profile S (www.onvif.org)		
	Security	Password protection, HTTPS encryption, digest authentication, WS authentication, user access log, 802.1x port based authentication					
	Protocols	IPv6, IPv4, HTTP, HTTPS, SOAP, DNS, NTP, RTSP, RTCP, RTP, TCP, UDP, IGMP, ICMP, DHCP, Zeroconf, ARP					
	Streaming Protocols	RTP/UDP, RTP/UDP multicast, RTP/RTSP/TCP, RTP/RTSP/HTTP/TCP, RTP/RTSP/HTTPS/TCP, HTTP					
	Device Management Protocols	SNMP v2c, SNMP v3					
PERIPHERALS	USB Port	USB 2.0					
	Onboard Storage	SD/SDHC/SDXC slot – minimum class 4; class 6 or better recommended					
	External I/O Terminals	Alarm In, Alarm Out					
	Audio Input/Output	Line level input and output					
MECHANICAL	Dimensions (LxWxH)	335 mm x 126 mm x 91 mm; 13.18" x 4.97" x 3.58" (including mounting bracket and fully extended sunshield overhang)					
	Weight	Camera	1.72 kg (3.79 lbs)		1.92 kg (4.23 lbs)		
		Mounting Bracket	0.21 kg (0.46 lbs)				
	Body	Aluminium					
	Housing	Surface mount, tamper resistant					
	Finish	Powder coat, RAL 9003					
	Adjustment Range	±175° pan, ±90° tilt, ±175° azimuth					
ELECTRICAL	Power Consumption	8W			9W		
	Power Source	VDC: 12V +/- 10%, 8W min. VAC: 24V +/- 10%, 15VA min. PoE: IEEE802.3af Class 3 compliant			VDC: 12V +/- 10%, 9W min. VAC: 24V +/- 10%, 15VA min. PoE: IEEE802.3af Class 3 compliant		
	RTC Backup Battery	3V manganese lithium					
ENVIRONMENTAL	Operating Temperature	-40 °C to +65 °C (-40 °F to 149 °F)					
	Storage Temperature	-10 °C to +70 °C (14 °F to 158 °F)					
	Humidity	0 - 93% non-condensing					
CERTIFICATIONS	Certifications/Directives	UL, cUL, CE, ROHS, Reach (SVHC), WEEE, RCM, EAC			UL, cUL, CE, ROHS, Reach (SVHC), WEEE, RCM, EAC		
	Safety	UL 62368-1, CSA 62368-1, IEC/EN 62368-1					
	Environmental	UL/CSA/IEC 60950-22, IEC 60529 IP66 Weather Rating, IK10 Impact Rating (including window)			UL/CSA/IEC 60950-22, IEC 60529 IP66 and IP67 Weather Rating, IK10 Impact Rating (enclosure only)		
	Electromagnetic Emissions	FCC Part 15 Subpart B Class B, IC ICES-003 Class B, EN 55032 Class B, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3					
	Electromagnetic Immunity	EN 55024, EN 61000-6-1, EN 50130-4			EN 55024, EN 61000-6-1		



CAMERA SPECIFICATIONS

SUPPORTED VIDEO ANALYTIC EVENTS

Objects in Area	The event is triggered when the selected object type moves into the region of interest.
Object Loitering	The event is triggered when the selected object type stays within the region of interest for an extended amount of time.
Objects Crossing Beam	The event is triggered when the specified number of objects have crossed the directional beam that is configured over the camera's field of view. The beam can be unidirectional or bidirectional.
Object Appears or Enters Area	The event is triggered by each object that enters the region of interest. This event can be used to count objects.
Object Not Present in Area	The event is triggered when no objects are present in the region of interest
Objects Enter Area	The event is triggered when the specified number of objects have entered the region of interest.
Objects Leave Area	The event is triggered when the specified number of objects have left the region of interest.
Object Stops in Area	The event is triggered when an object in a region of interest stops moving for the specified threshold time.
Direction Violated	The event is triggered when an object moves in the prohibited direction of travel.
Tamper Detection	The event is triggered when the scene unexpectedly changes.

CLASSIFIED OBJECT DETECTION RANGE

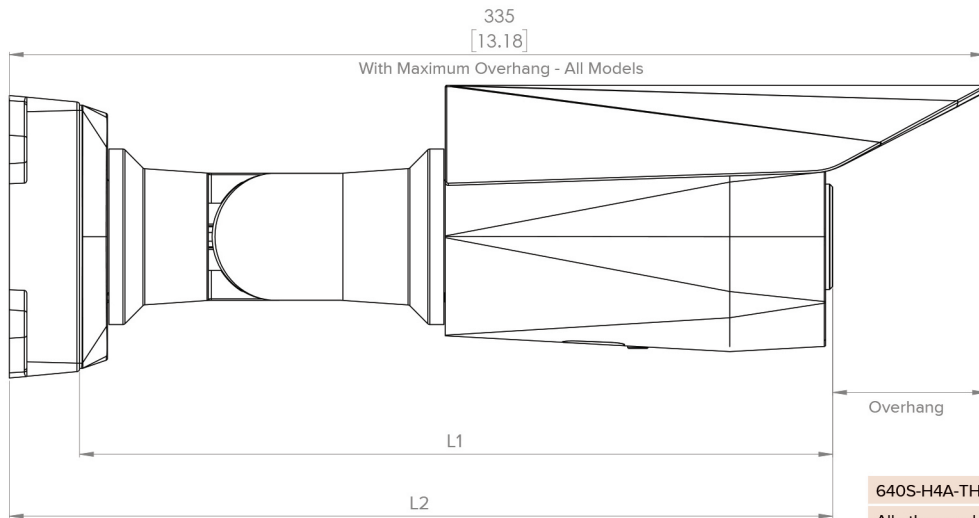
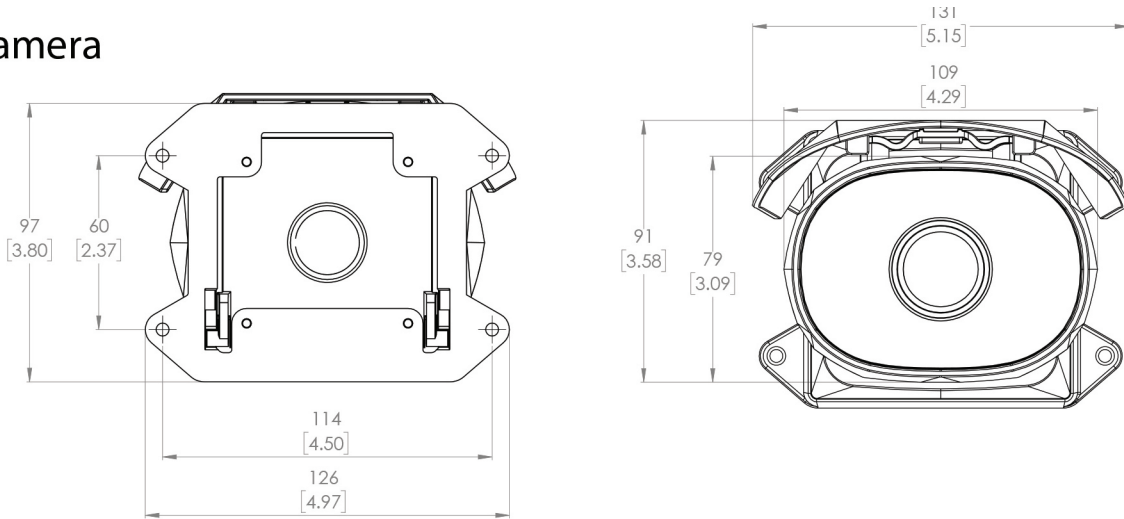
FOCAL LENGTH	RESOLUTION	VIEWING ANGLE (H X V)	HUMAN	VEHICLE
4.3 mm	320 x 256	45.9° x 36.5°	68m (224')	80m (263')
9.1 mm	320 x 256	21.6° x 17.0°	150m (493')	160m (525')
18 mm	320 x 256	10.8° x 8.4°	220m (722')	225m (739')
8.7 mm	640 x 512	50.7° x 40.4°	120m (394')	142m (466')
18 mm	640 x 512	24.3° x 19.3°	210m (689')	225m (739')
36 mm	640 x 512	12.2° x 9.7°	310m (1017')	319m (1047')

The detection ranges may vary in different weather conditions.



CAMERA DIMENSIONS

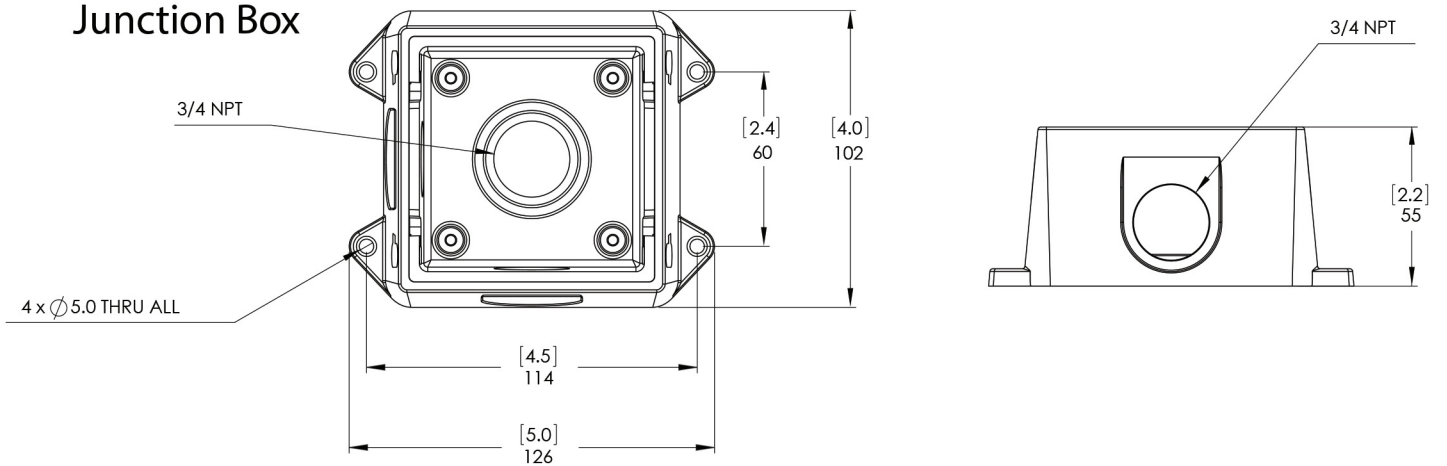
Camera



X	MM
[X.X]	INCHES

	L1	L2
640S-H4A-THC-BO12	276 mm (10.87")	300 mm (11.81")
All other models	257 mm (10.14")	281 mm (11.08")

Junction Box





CAMERA SPECIFICATIONS

H5A Camera Line

4 MP

5 MP

6 MP

8 MP



Features



NEXT-GENERATION VIDEO ANALYTICS

Expanded object classifications and more accurate detection in crowded scenes so you can detect and act faster.



FOCUS OF ATTENTION WITH ACC™7

Leverages AI and video analytics technologies to determine what information is important and should be presented to security operators.



H.265 WITH HDSM SMARTCODEC™ TECHNOLOGY

Optimizes compression levels for regions in a scene to help maximize bandwidth savings, helping to keep internet connectivity costs down.



LIGHTCATCHER™ TECHNOLOGY

Offers exceptional detail in areas with low lighting.



TRUE WIDE DYNAMIC RANGE

Available in all resolutions, capture details in scenes with both very bright and dark areas.



MULTIPLE LENS OPTIONS

Choose from various lens types, including long zoom, for flexible coverage options.



ONVIF® COMPLIANT

Built on an open platform to allow integration with other security solutions.



CAMERA SPECIFICATIONS

		2.0 MP	4.0 MP	5.0 MP	6.0 MP	8.0 MP (4K ULTRA HD)	
IMAGE PERFORMANCE	Image Sensor	1/2.8" progressive scan CMOS			1/1.8" progressive scan CMOS		
	Max Resolution (H x V) and Aspect Ratio	(16:9) 1920 x 1080	(16:9) 2560 x 1440 (4:3) 2304 x 1728	(4:3) 2592 x 1944 (16:9) 2560 x 1440	(16:9) 3200 x 1800 (3:2) 3072 x 2048	(16:9) 3840 x 2160	
	Dynamic Range	WDR Off	83 dB	83 dB	83 dB	85 dB	85 dB
		WDR On	126 dB (dual exposure, 30 fps) 132 dB (triple exposure, 20 fps or less)	126 dB	126 dB	120 dB	120 dB
	Max Image Rate	(50 Hz/60 Hz): 25 fps/30 fps	WDR off (50 Hz/60 Hz): 25 fps/30 fps WDR on (50 Hz/60 Hz): 20 fps/20 fps		(50 Hz/60 Hz): 25 fps/30 fps		
	Bandwidth Management	HDSM SmartCodec technology; Idle scene mode					
3D Noise Reduction Filter	Yes						
LENS AND IR ILLUMINATION			3.3 – 9 mm	4.9 – 8 mm	9 – 22 mm	4.7 – 84.6 mm	
	IR Illumination Max Distance ¹ (high power 850 nm LEDs)	Dome	35 m (115 ft), full tele 15 m (49 ft), full wide	30 m (98 ft), full tele 15 m (49 ft), full wide	N/A	N/A	
		Bullet	50 m (164 ft), full tele 30 m (98 ft), full wide	50 m (164 ft), full tele 30 m (98 ft), full wide	90 m (295 ft), full tele 60 m (197 ft), full wide	N/A	
	Minimum Illumination	2 MP	0.027 lux in color mode, 0.014 lux in monochrome mode, 0 lux with IR	N/A	0.052 lux in color mode, 0.026 lux in monochrome mode, 0 lux with IR	0.039 lux in color mode, 0.02 lux in monochrome mode	
		4 MP	0.03 lux in color mode, 0.015 lux in monochrome mode, 0 lux with IR	N/A	0.058 lux in color mode, 0.029 lux in monochrome mode, 0 lux with IR	N/A	
		5 MP	N/A	N/A	0.058 lux in color mode, 0.029 lux in monochrome mode, 0 lux with IR	N/A	
		6 MP	N/A	0.055 lux in color mode, 0.028 lux in monochrome mode, 0 lux with IR	N/A	N/A	
		8 MP	N/A	0.055 lux in color mode, 0.028 lux in monochrome mode, 0 lux with IR	N/A	N/A	
	Horizontal Angle of View Based on Aspect Ratio	2 MP	(16:9) 34° – 99°	N/A	(16:9) 14° – 31°	(16:9) 4.1° – 60°	
		4 MP	(16:9)(4:3) 34° – 92°	N/A	(16:9)(4:3) 14° – 31° (4:3) 11° – 24°	N/A	
		5 MP	N/A	N/A	(16:9)(4:3) 14° – 31°	N/A	
		6 MP	N/A	(16:9) 52° – 92° (3:2) 41° – 73°	N/A	N/A	
		8 MP	N/A	(16:9) 52° – 92°	N/A	N/A	
	Vertical Angle of View Based on Aspect Ratio	2 MP	(16:9) 18° – 53°	N/A	(16:9) 7.8° – 16.7°	(16:9) 2.3° – 34°	
		4 MP	(16:9) 18° – 50° (4:3) 25° – 68°	N/A	(16:9) 8.2° – 17.4°	N/A	
		5 MP	N/A	N/A	(16:9) 8.1° – 17.4° (4:3) 11° – 23°	N/A	
		6 MP	N/A	(16:9) 29° – 51° (3:2) 27° – 48°	N/A	N/A	
8 MP		N/A	(16:9) 29° – 51°	N/A	N/A		
Max Aperture	F1.3	F1.8	F1.6	F1.6			
Control	P-Iris, Remote Focus and Zoom						
¹ IR illumination power may be reduced at higher operating temperatures.							
IMAGE CONTROL	Image Compression Method	H.264 HDSM SmartCodec, H.265 HDSM SmartCodec, Motion JPEG					
	Streaming	Multi-stream H.264, Multi-stream H.265, Motion JPEG; HDSM 2.0 on 4.0 MP, 5.0 MP, 6.0 MP, and 4K (8.0 MP) cameras					
	Motion Detection	Pixel motion: Selectable sensitivity and threshold. Classified object detection					
	Camera Tamper Detection	Yes					
	Electronic Shutter Control	Automatic, Manual (1/7 to 1/8196 sec)					
	Iris Control	Automatic, Open, Closed					
	Day/Night Control	Automatic, Manual					
	Flicker Control	60 Hz, 50 Hz					
	White Balance	Automatic, Manual					
	Backlight Compensation	Adjustable					
	Privacy Zones	Up to 64 zones					
NETWORK	Network	100BASE-TX, RJ45 Connector, CAT5e Cabling					
	ONVIF	ONVIF compliance version 1.02, 2.00, Profile S, Profile T (www.onvif.org)					
	Security	Password protection, HTTPS encryption, digest authentication, WS authentication, user access log, 802.1x port based authentication					
	Protocols	IPv6, IPv4, HTTP, HTTPS, SOAP, DNS, NTP, RTSP, RTCP, RTP, TCP, UDP, IGMP, ICMP, DHCP, Zeroconf, ARP					
	Streaming Protocols	RTP/UDP, RTP/UDP multicast, RTP/RTSP/TCP, RTP/RTSP/HTTP/TCP, RTP/RTSP/HTTPS/TCP, HTTP					
	Device Management Protocols	SNMP v2c, SNMP v3					
PERIPHERALS	USB Port	USB 2.0					
	Onboard Storage	Dome	microSD/microSDHC/microSDXC slot – class 10/UHS-1 or better recommended				
		Bullet and Box	SD/SDHC/SDXC slot – class 10/UHS-1 or better recommended				



CAMERA SPECIFICATIONS

AUXILIARY I/O	Audio Compression Method	G.711 PCM 8 kHz			
	Audio Input/Output	Line level input and output			
	External I/O Terminals	Alarm In, Alarm Out			
	RS-485 Terminal	Yes, Box camera only			
MECHANICAL (BULLET)	Dimensions (LxWxH)	280 mm x 126 mm x 91 mm; 11.04" x 4.97" x 3.58" (including mounting bracket)			
	Weight	Camera	1.71 kg (3.77 lbs)		
		Mounting Bracket	0.21 kg (0.46 lbs)		
	Body	Aluminum			
	Housing	Surface mount, tamper resistant			
	Finish	Powder coat, RAL 9003			
	Adjustment Range	±175° pan, ±90° tilt, ±175° azimuth			
MECHANICAL (BOX)	Dimensions (LxWxH)	168 mm x 76 mm x 67 mm; 6.6" x 3.0" x 2.6"			
	Weight	0.62 kg (1.4 lbs)			
	Body	Aluminum			
	Camera Mount	1/4"-20 UNC (top and bottom)			
	Finish	Powder coat, black			
ELECTRICAL	Power Consumption	Bullet	13 W max		
		Box	7 W max		
	Power Source	Bullet	VDC: 12 V ± 10%, 13 W min	VAC: 24 V ± 10%, 15 VA min	PoE: IEEE802.3af Class 3 compliant
		Box	VDC: 12 V ± 10%, 7 W min	VAC: 24 V ± 10%, 9 VA min	PoE: IEEE802.3af Class 3 compliant
	RTC Backup Battery	3V manganese lithium			
ENVIRONMENTAL	Operating Temperature	Bullet	-40 °C to +60 °C (-40 °F to 140 °F), in enclosed space		
		Box	-40 °C to +65 °C (-40 °F to 149 °F), with ambient convection		
	IR Illuminator Behavior	Bullet	-10 °C to +60 °C (-14 °F to 140 °F)		
		Bullet	IR illuminator will turn off if the temperature is 61 °C (141 °F) or higher. The illuminator will operate at 50% power if the temperature is between 55 °C (131 °F) and 61 °C (141 °F). Hysteresis: 5 °C (9 °F).		
	Storage Temperature	-10 °C to +70 °C (14 °F to 158 °F)			
Humidity	0 - 95% non-condensing				
CERTIFICATIONS	Certifications/Directives	UL, cUL, CE, ROHS, Reach (SVHC), RCM, EAC, BIS, KC			
	Safety	UL 62368-1, CSA 62368-1, IEC/EN 62368-1, IEC 62471 (with -IR option)			
	Environmental	Bullet	UL/CSA/IEC 60950-22, IEC 60529 IP66 and IP67 Weather Rating, IEC 62262 IK10 Impact Rating		
		Outdoor Dome	UL/CSA/IEC 60950-22, IEC 60529 IP66 and IP67 Weather Rating, IEC 62262 IK10 Impact Rating		
	Electromagnetic Emissions	FCC Part 15 Subpart B Class B, IC ICES-003 Class B, EN 55032 Class B, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3			
	Electromagnetic Immunity	EN 55024, EN 61000-6-1			

ANALYTICS SPECIFICATIONS

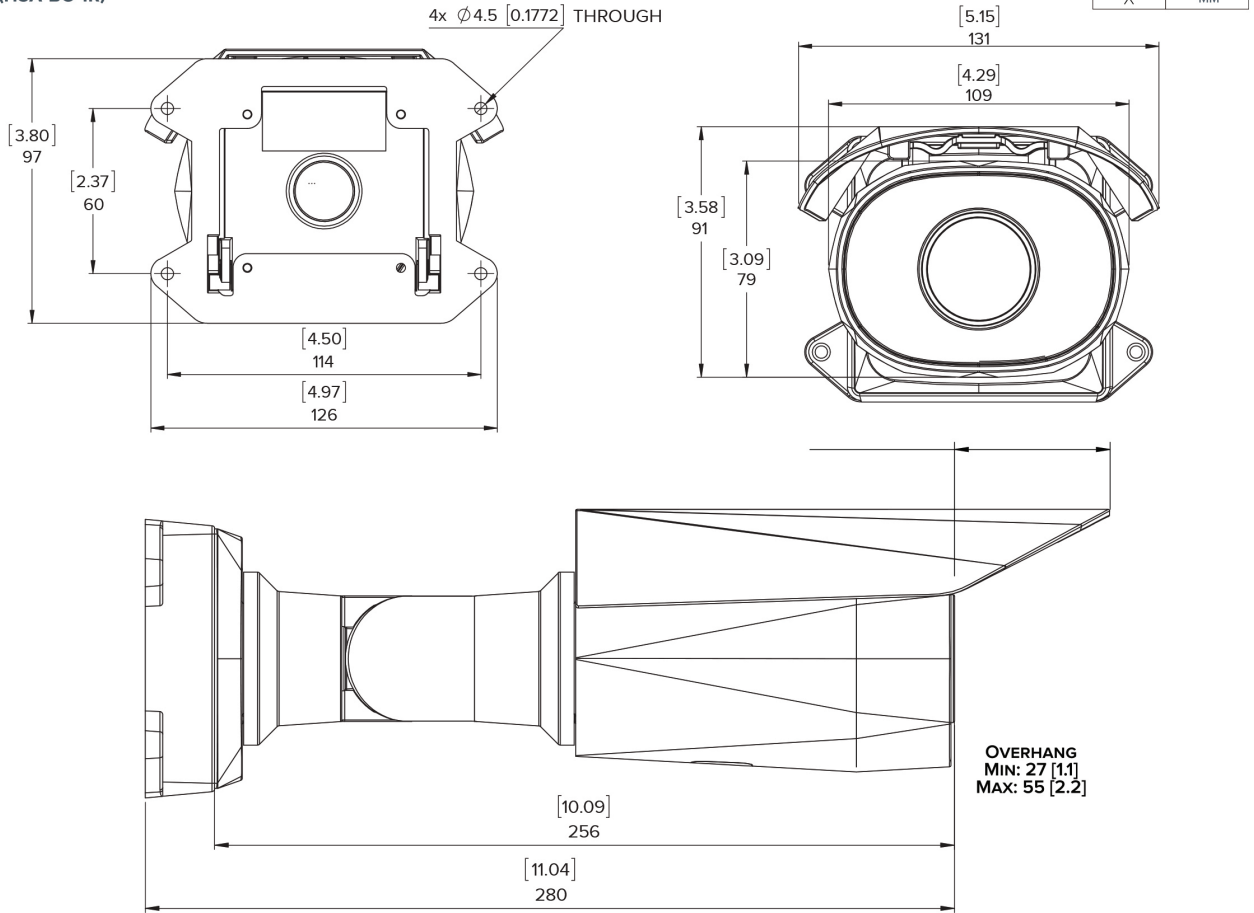
SUPPORTED ANALYTICS EVENTS	Objects in Area	The event is triggered when the selected object type moves into the region of interest.
	Object Loitering	The event is triggered when the selected object type moves into the region of interest and then stays for an extended amount of time.
	Objects Crossing Beam	The event is triggered when the specified number of objects have crossed the directional beam that is configured over the camera's field of view. The beam can be unidirectional or bidirectional.
	Object Appears or Enters Area	The event is triggered by each object that enters the region of interest. This event can be used to count objects.
	Object Not Present in Area	The event is triggered when no objects are present in the region of interest.
	Objects Enter Area	The event is triggered when the specified number of objects have entered the region of interest.
	Objects Leave Area	The event is triggered when the specified number of objects have left the region of interest.
	Object Stops in Area	The event is triggered when an object moves into a region of interest and then stops moving for the specified threshold time.
	Direction Violated	The event is triggered when an object moves in the prohibited direction of travel.
	Tamper Detection	The event is triggered when the scene unexpectedly changes.
SUPPORTED CLASSIFIED OBJECT TYPES	Object Types in Outdoor Mode	Vehicle, sub-types: Car, Truck, Bicycle, Motorcycle, Bus Person
	Object Types in Indoor Mode	Person
TEACH BY EXAMPLE	Teach By Example	Yes, when used with Avigilon Control Center™
AVIGILON CONTROL CENTER (ACC) VERSIONS SUPPORTED FEATURES	ACC Version 6.14.12 or higher	All supported analytic events with two types of classified objects: person or vehicle. Appearance search when paired with appropriate server hardware. H.265 supported.
	ACC Version 7.2 or higher	All supported analytic events with people and vehicles and all vehicle sub-types as classified objects. Appearance search when paired with appropriate server hardware. H.265 supported.



CAMERA DIMENSIONS

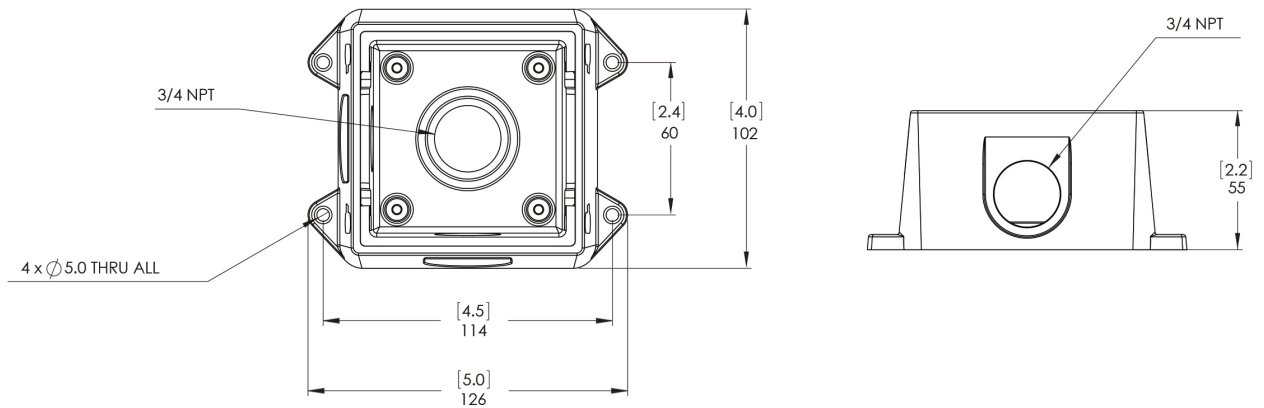
Bullet Camera

(H5A-BO-IR)



HD Bullet Camera Junction Box

(H4-BO-JBOX1)





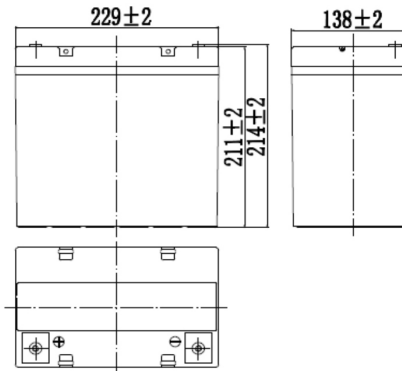
BATTERY SPECIFICATIONS

BW 12550 DC (12V55Ah) SPECIFICATIONS

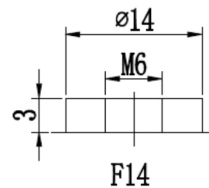
Nominal Voltage		12 V
Capacity (25C°)	20HR	55 Ah
	5HR	44 Ah
	1HR	30.5 Ah
Dimension	Length	229±2mm (9.02inch)
	Width	138±2mm (5.43inch)
	Height	211±2mm (8.31inch)
	Total Height	214±2mm (8.43inch)
Approx. Weight		15.5kg (34.2lbs)±4%
Terminal type		Z (Pic) or M6
Internal resistance (Fully charged, 25C°)		Approx. 7.5mΩ
Capacity affected by temperature (10HR)	40C°	102%
	25C°	100%
	0C°	85%
	-15C°	65%
Self-discharge (25C°)	3 month	Remaining Capacity: 91%
	6 month	Remaining Capacity: 82%
	12 month	Remaining Capacity: 65%
Nominal operating temperature		25C°±3C°(77F°±5F°)
Operating temperature range	Discharge	-15C° ~ 50C°(5F° ~ 122F°)
	Charge	-10C° ~ 50C°(14F° ~ 122F°)
	Storage	-20C° ~ 50C°(-4F° ~ 122F°)
Float charging voltage(25C°)		13.50 to 13.80V Temperature compensation: -18mV/C°
Cyclic charging voltage(25C°)		14.50 to 15.00V Temperature compensation: -30mV/C°
Maximum charging current		15A
Maximum discharge current		500 A(5 sec.)
Designed floating life(20C°)		10 years



DIMENSIONS



TERMINAL



CONSTRUCTION

Component	Positive plate	Negative plate	Container	Cover	Separator	Electrolyte	Safety valve	Terminal
Raw material	Lead dioxide	Lead	ABS	ABS	AGM	Sulfuric acid	Rubber	Copper

CONSTANT CURRENT DISCHARGE CHARACTERISTICS

F.V/TIME	10min	15min	30min	60min	2h	3h	4h	5h	8h	10h	20h
9.60V	109	84.0	50.3	30.9	18.3	13.0	10.5	8.98	6.17	5.09	2.70
9.90V	106	82.0	49.2	30.4	18.2	12.9	10.4	8.92	6.13	5.08	2.69
10.2V	101	79.0	47.7	29.7	18.0	12.8	10.4	8.86	6.09	5.07	2.68
10.5V	97.0	76.3	46.6	29.0	17.7	12.8	10.3	8.80	6.05	5.04	2.67
10.8V	91.6	72.2	44.9	28.1	17.3	12.4	9.99	8.54	5.87	5.00	2.65

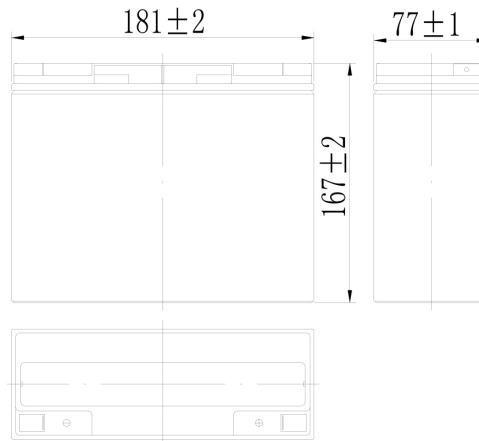


BW 12180 DC (12V18Ah) SPECIFICATIONS

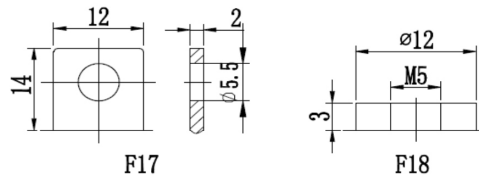
Nominal Voltage		12 V
Capacity (25C°)	20HR	18 Ah
	10HR	16 Ah
	1HR	11 Ah
Dimension	Length	181±2mm (7.13inch)
	Width	77±1mm (3.03inch)
	Height	167±2mm (6.57inch)
	Total Height	167±2mm (6.57inch)
Approx. Weight		5.25kg (11.55lbs)±5%
Terminal type		F2 or NB or M5
Internal resistance (Fully charged, 25C°)		Approx. 18mΩ
Capacity affected by temperature (20HR)	40C°	102%
	25C°	100%
	0C°	85%
	-15C°	65%
Self-discharge (25C°)	3 month	Remaining Capacity: 91%
	6 month	Remaining Capacity: 82%
	12 month	Remaining Capacity: 65%
Nominal operating temperature		25C°±3C°(77F°±5F°)
Operating temperature range	Discharge	-15C° ~ 50C°(5F° ~ 122F°)
	Charge	-10C° ~ 50C°(14F° ~ 122F°)
	Storage	-20C° ~ 50C°(-4F° ~ 122F°)
Float charging voltage(25C°)		13.60 to 13.80V Temperature compensation: -18mV/C°
Cyclic charging voltage(25C°)		14.50 to 15.00V Temperature compensation: -30mV/C°
Maximum charging current		5.1A
Maximum discharge current		255 A(5 sec.)
Designed floating life(20C°)		5 years



DIMENSIONS



TERMINAL



CONSTRUCTION

Component	Positive plate	Negative plate	Container	Cover	Separator	Electrolyte	Safety valve	Terminal
Raw material	Lead dioxide	Lead	ABS	ABS	AGM	Sulfuric acid	Rubber	Copper

CONSTANT CURRENT DISCHARGE CHARACTERISTICS (A, 25°C)

F.V/TIME	10min	15min	30min	60min	2h	3h	4h	5h	8h	10h	20h
9.60V	41.1	32.1	18.1	11.1	6.09	4.21	3.49	2.97	1.92	1.61	0.86
9.90V	39.9	31.4	17.7	11.0	6.06	4.19	3.46	2.95	1.91	1.60	0.86
10.2V	38.3	30.2	17.2	10.7	6.00	4.16	3.44	2.93	1.90	1.60	0.86
10.5V	36.6	29.2	16.8	10.5	5.91	4.13	3.42	2.91	1.89	1.59	0.85
10.8V	34.6	27.6	16.2	10.2	5.76	4.01	3.31	2.82	1.83	1.55	0.83

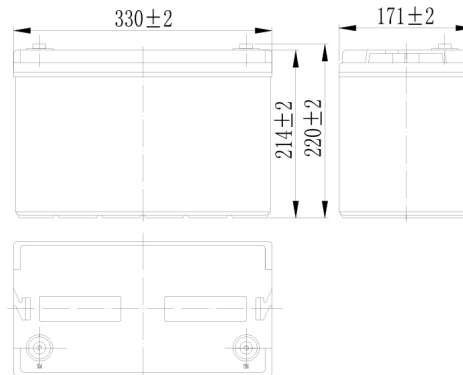


BW 12110 DC (12V110Ah) SPECIFICATIONS

Nominal Voltage		12 V
Capacity (25C°)	20HR	110 Ah
	5HR	97 Ah
	1HR	68 Ah
Dimension	Length	330±2mm (12.99inch)
	Width	171±2mm (6.73inch)
	Height	214±2mm (8.43inch)
	Total Height	220±2mm (8.66inch)
Approx. Weight		27.5kg (60.5lbs)±4%
Terminal type		Z (Pic) or M8
Internal resistance (Fully charged, 25C°)		Approx. 4mΩ
Capacity affected by temperature (10HR)	40C°	102%
	25C°	100%
	0C°	85%
	-15C°	65%
Self-discharge (25C°)	3 month	Remaining Capacity: 91%
	6 month	Remaining Capacity: 82%
	12 month	Remaining Capacity: 65%
Nominal operating temperature		25C°±3C°(77F°±5F°)
Operating temperature range	Discharge	-15C° ~ 50C°(5F° ~ 122F°)
	Charge	-10C° ~ 50C°(14F° ~ 122F°)
	Storage	-20C° ~ 50C°(-4F° ~ 122F°)
Float charging voltage(25C°)		13.50 to 13.80V Temperature compensation: -18mV/C°
Cyclic charging voltage(25C°)		14.50 to 15.00V Temperature compensation: -30mV/C°
Maximum charging current		33A
Maximum discharge current		800 A(5 sec.)
Designed floating life(20C°)		10 years



DIMENSIONS



TERMINAL

CONSTRUCTION

Component	Positive plate	Negative plate	Container	Cover	Separator	Electrolyte	Safety valve	Terminal
Raw material	Lead dioxide	Lead	ABS	ABS	AGM	Sulfuric acid	Rubber	Copper

CONSTANT CURRENT DISCHARGE CHARACTERISTICS

F.V/TIME	10min	15min	30min	60min	2h	3h	4h	5h	8h	10h	20h
9.60V	240	185	111	68.0	40.2	28.6	23.1	19.7	13.6	11.2	5.93
9.90V	233	180	108	67.0	40.0	28.4	23.0	19.6	13.5	11.2	5.92
10.2V	223	174	105	65.3	39.6	28.2	22.8	19.5	13.4	11.1	5.91
10.5V	213	168	102	63.9	39.0	28.1	22.7	19.4	13.3	11.1	5.87
10.8V	201	159	99	61.9	38.0	27.2	22.0	18.8	12.9	11.0	5.83



TESTING CERTIFICATIONS

AES 20-10 Report

Final Report – High Temperature 127°F High Humidity 97%RH Test for K & K Systems



AES Test Lab
4333 Silver Star Road, Suite 105
Orlando, Florida 32808
407-405-1162
arvinblank@aestestlab.com

REPORT NUMBER AES 20-10

October 5, 2020

Purchase Order: Verbal

Summary

The report presents the details of a High Temperature 127°F (53°C) and High Humidity 97% RH test, on a K & K Systems WWS-SP-1 Full Wrong Way System performed on September 26 – October 5, 2020.

The Full Wrong Way System was subjected to a 10-day constant 127°F, 95%RH humidity operational test, which simulates 1 year of use per MIL-STD-810 method 507.5 with no failures.

Test Hardware

One K & K systems, WWS-SP-1 Full Wrong Way System with 3 cameras and server with cell modem powered by AC 120V was provided to AES Test Lab by K & K Systems, Tupelo Mississippi.

The K & K Systems WWP-SP-1 consists of the following hardware:

Model	Description	Use	Quantity
640S-H4A-THC-BO50	640x512, Thermal Outdoor Bullet, AC/DC	Thermal Detection	1
4.0C-H5A-BO1-IR	4.0 MP WDR, LightCatcher, AC/DC	Visible Light Detection and Infrared Detection	1
3.0C-H4A-25G-BO1-IR-B	3.0 MP WDR, LightCatcher, w/ Built-in SSD, AC/DC	Visible Light Detection and Infrared Detection	1
KK-700	PC Built for camera server with Cell Modem	Server for Cameras or other devices	1
LPVL-150-12	100-120V AC to 12v 10A DC Power Supply	Powers Cameras and Server	2



Final Report – Low Temperature -35°F Low Humidity 20%RH Test for K & K Systems



AES Test Lab
4333 Silver Star Road, Suite 105
Orlando, Florida 32808
407-405-1162
arvinblank@aestestlab.com

REPORT NUMBER AES 20-11

October 14, 2020

Purchase Order: Verbal

Summary

The report presents the details of a Low Temperature -35°F (-37°C) and Low Humidity 20% RH test, on a K & K Systems WWS-SP-1 Full Wrong Way System performed on October 5-13, 2020.

The Full Wrong Way System was subjected to a 7-day constant -35°F, 20%RH humidity operational test, which simulates 1 year of use per MIL-STD-810 method 502.5 with no failures.

Test Hardware

One K & K systems, WWS-SP-1 Full Wrong Way System with 3 cameras and server with cell modem powered by AC 120V was provided to AES Test Lab by K & K Systems, Tupelo Mississippi.

The K & K Systems WWP-SP-1 consists of the following hardware:

Model	Description	Use	Quantity
640S-H4A-THC-BO50	640x512, Thermal Outdoor Bullet, AC/DC	Thermal Detection	1
4.0C-H5A-BO1-IR	4.0 MP WDR, LightCatcher, AC/DC	Visible Light Detection and Infrared Detection	1
3.0C-H4A-25G-BO1-IR-B	3.0 MP WDR, LightCatcher, w/ Built-in SSD, AC/DC	Visible Light Detection and Infrared Detection	1
KK-700	PC Built for camera server with Cell Modem	Server for Cameras or other devices	1
LPVL-150-12	100-120V AC to 12v 10A DC Power Supply	Powers Cameras and Server	2



Final Report – Salt Spray Test for K&K Systems Full Wrong Way Systems WWS-SP-1



Arvin's Engineered Solutions/AES Test Lab
3788 Silver Star Road
Orlando, Florida 32808
407-405-1162
arvinblank@bellsouth.net
arvinblank@aestestlab.com

REPORT NUMBER AES 20-15

November 30, 2020

Purchase Order: Verbal

Summary

The report presents the details of a Salt Spray test, on a K & K Systems WWS-SP-1 Full Wrong Way System performed on November 2 – 10, 2020.

The Full Wrong Way System was subjected to a 168 hour (7-day) constant 93°F, 99%RH humidity Salt Spray test, which simulates 2-3 year of use per ASTM B117 with no failures.

The three cameras used for the WWS were exposed inside the salt chamber simulating real life exposure, while the computer, power supplies and associate hardware were placed in a NEMA cabinet before being placed in the salt chamber.

Test Procedure

1. Place the WWS cameras on plastic tray, stand up cabinet inside salt chamber.





Test Report: PR116125-00-ACT1581599 Rev. A



www.nts.com

Issue Date: 11 September 2020	Purchase Order: AES 20-023A	Line #: 4
Test Start: 05 August 2020	NTS Opportunity: OP0557314-0	Line #: 2
Test Complete: 05 August 2020		

NEMA TS 4 ELECTROSTATIC DISCHARGE (ESD) TEST REPORT

FOR THE

P/N 3.0C-H4A-25G-BO1-IR-B THERMAL CAMERA

P/N 4.0C-H5A-BO1-IR OPTICAL CAMERA

P/N 640S-H4A-THC-BO50 OPTICAL CAMERA

P/N KK700PC SERVER

COMPONENTS OF THE

K & K SYSTEMS P/N WWS-AC-1 WRONG WAY SYSTEM

TESTING PERFORMED BY:

TESTING PERFORMED FOR:

NATIONAL TECHNICAL SYSTEMS

6881 Kingspointe Parkway, Suite 15
Orlando, Florida 32819

K&K SYSTEMS

687 Palmetto Road
Tupelo, Mississippi 38801

TEST REPORT PREPARED BY:


Jamie Lilley, Technical Writer

TEST REPORT APPROVED BY:


Eugene DeVito, EMI Department Manager

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Test Report: PR116125-1580329



www.nts.com

Issue Date: 11 September 2020	Purchase Order: AES 20-023	Line #: 1
Test Start: 11 August 2020	NTS Opportunity: OP0547514	Line #: 1
Test Complete: 03 September 2020		

NEMA TS 4 VIBRATION AND SHOCK TEST REPORT

FOR THE

P/N 3.0C-H4A-25G-BO1-IR-B THERMAL CAMERA,

P/N 4.0C-H5A-BO1-IR OPTICAL CAMERA,

P/N 640S-H4A-THC-BO50 OPTICAL CAMERA,

P/N KK700PC SERVER,

P/N LPVL-150-12 POWER SUPPLY,

COMPONENTS OF THE

K & K SYSTEMS P/N WWS-AC-1 WRONG WAY SYSTEM

TESTING PERFORMED BY:

TESTING PERFORMED FOR:

NATIONAL TECHNICAL SYSTEMS

5325 Old Winter Garden Road
Orlando, Florida 32811-1520

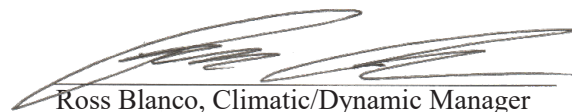
K&K SYSTEMS

687 Palmetto Road
Tupelo, Mississippi 38801

TEST REPORT PREPARED BY:

TEST REPORT APPROVED BY:


Matthew Matrisciano, Technical Writer


Ross Blanco, Climatic/Dynamic Manager

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Test Report: PR116125-1580330



www.nts.com

Issue Date: 11 September 2020	Purchase Order: AES 20-023	Line #: 2
Test Start: 24 August 2020	NTS Opportunity: OP0547514	Line #: 2
Test Complete: 31 August 2020		

NEMA TS 4 TEMPERATURE TEST REPORT

FOR THE

P/N 3.0C-H4A-25G-BO1-IR-B THERMAL CAMERA,

P/N 4.0C-H5A-BO1-IR OPTICAL CAMERA,

P/N 640S-H4A-THC-BO50 OPTICAL CAMERA,

P/N KK700PC SERVER,

P/N LPVL-150-12 POWER SUPPLY,

COMPONENTS OF THE

K & K SYSTEMS P/N WWS-AC-1 WRONG WAY SYSTEM

TESTING PERFORMED BY:

TESTING PERFORMED FOR:

NATIONAL TECHNICAL SYSTEMS

5325 Old Winter Garden Road
Orlando, Florida 32811-1520


K&K SYSTEMS

687 Palmetto Road
Tupelo, Mississippi 38801

TEST REPORT PREPARED BY:

TEST REPORT APPROVED BY:


Matthew Matrisciano, Technical Writer


Ross Blanco, Climatic/Dynamic Manager

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ATTESTATION OF CONFORMITY

Attestation Number: **1588AB0601N006001**
 Product: **Switching power supplies**
 Brand Name: **Mean Well**
 Model: **LPVL-150-x (x=12, 24)**
 Applicant: **Mean Well Enterprises Co., Ltd.**
 Address: **No.28, Wuquan 3rd Rd., Wugu Dist., New Taipei City 248, Taiwan**
 Technical Characteristics: **Input: 100-120V~ 3.0A, 50/60Hz**

The submitted sample of the above equipment has been tested according to following standard(s):

Standards	Report Number	Report date
FCC Part 15 Subpart B, Class B ICES-003 Issue 5:2012	FV150601N006	Jun. 27, 2015

The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements.

This verification does not imply assessment of the production of the product.

Supervisor
EMC Department

Name: Madison Luo
Date: Jun. 27, 2015

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Information given in this document is related to the tested specimen of the described electrical sample.



Test Report No.: CE150601N006



TEST REPORT

Applicant	Mean Well Enterprises Co., Ltd.
Address	No.28, Wuquan 3rd Rd., Wugu Dist., New Taipei City 248, Taiwan

Manufacturer or Supplier	1. Mean Well Enterprises Co., Ltd. 2. Mean Well (Guangzhou) Electronics Co., Ltd. 3. SuZhou Mean Well Technology Co., Ltd.	
Address	1. No.28, Wuquan 3rd Rd., Wugu Dist., New Taipei City 248, Taiwan 2. 2/F, A Building, Yuean Industrial Park, Huangcun, Dongpu Town, Tianhe District, Guangzhou, Guangdong Province, China 3. No.77, Jianmin Road, Dongqiao, Panyang Ind. Park, Huangdai Town Xiangcheng District, Suzhou, China	
Product	Switching power supplies	
Brand Name	Mean Well	
Model	LPVL-150-x (x=12, 24)	
Additional Model & Model Difference	See Items 2.1	
Date of tests	Jun. 01, 2015 ~ Jun. 27, 2015	

The submitted sample of the above equipment has been tested for according to the requirements of the following standards:

IEC-61000-4-2/3/4/5/6/8/11

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Jerry Fu Project Engineer / EMC Department	Approved by Madison Luo Supervisor / EMC Department
Date: Jun. 27, 2015	

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