DATALOGIC

AV6010

System Manual

AccuVision® AV6010 Long-Range Camera System Manual

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Preface

The **AccuVision® AV6010 Long-Range Camera System Manual** from Accu-Sort Systems, Inc. includes the information you need to effectively integrate the **AV6010 Camera System** with your application.

It contains detailed information about the following:

- Product features, capabilities, specifications and accessories
- Safety information
- Installation guidelines and procedures
- Configuring the camera system for your application
- Maintenance and Troubleshooting

This preface explains how this user manual is organized and introduces other sources of information that you will find useful.

Intended Audience

You should have a basic understanding of bar code scanning. Equipment installers must be familiar with standard wiring techniques and terminology. Because most Accu-Sort software applications run in the Microsoft® Windows® and internet browser environments, you should know how to use a mouse, choose commands, and work with windows and dialog boxes.

Thank You

Thank you for using the AccuVision AV6010 Camera System and this manual.

We value your comments and feedback. Feel free to let us know what you like or dislike about the AV6010 (or this manual) by e-mailing us at *info.automation.us@datalogic.com*.

You can also mail your comments to our corporate headquarters address or call us directly at 1-800-BAR-CODE™ or (215) 723-0981.

NOTE: There may be additional material that was not available when this product manual was produced. To learn if there is a documentation update, go to our web site's corresponding product page at www.datalogic.com.

Other Sources of Information

You can choose from many information sources, including documentation, training, and support services, to increase your knowledge and understanding of the AV6010. If this manual refers you to other documentation, use only the latest versions unless otherwise specified.

Conventions

WARNINGS or CAUTIONS: This symbol identifies a hazard or procedure that, if incorrectly performed, could cause personal injury or result in equipment damage. It is also used to bring the user's attention to details that are considered IMPORTANT.

HIGH VOLTAGE CAUTION: This symbol alerts the user they are about to perform an action involving, either a dangerous level of voltage, or to warn against an action that could result in damage to devices or electrical shock.

LASER/LED CAUTION: This symbol alerts the user they are about to perform an action involving possible exposure to laser/LED light radiation.

ESD CAUTION: This symbol identifies a procedure that requires you take measures to prevent Electrostatic Discharge (ESD) e.g., use an ESD wrist strap. Circuit boards are most at risk. Please follow ESD procedures.

NOTES: This symbol draws attention to important details or procedures that may be useful in improving, maintaining, or enhancing the performance of the hardware or software being discussed.

NOTE REGARDING DIMENSIONAL REFERENCES: This manual provides all dimensional references in inches. Metric references are provided in millimeters and enclosed in brackets. For example: 10 inches [254 mm].

Customer Service

Training

Accu-Sort Systems offers a complete set of training courses to help you and your staff get the most out of your investment. We can help you develop a training plan that provides thorough training for both your project team and your end users. We will work with you to organize courses appropriate to your job or area of responsibility. Training professionals can show you how to plan your training throughout the implementation process so that the right amount of information is delivered to key people when they need it the most. You can attend courses at our training center, or you can arrange for our trainers to teach at your facility. In addition, we can tailor standard courses or develop custom courses to meet your needs.

Support

From on-site support to central support, our team of experienced professionals provides the help and information you need to keep your equipment working for you. This team includes your Account Manager and Accu-Sort's large staff of support specialists with expertise in your business area and managing your hardware and software environment.

NOTE: If you have any problems or questions that require Accu-Sort's assistance, direct your calls to ***Customer Service*** at 1-800-BAR-CODE™ or (215) 723-0981.

1 Introduction

This section presents a detailed description of the **AccuVision® AV6010 Long-Range Camera Systems**. It begins with a product overview. The system's features are described in detail.

- System Overview
- User Interface
- Ordering Options and Accessories

Product Overview

The AccuVision AV6010 Long-Range Camera System includes:

❶ AV6010 Camera with integrated:
- Camera Head Module
- Illumination Module
- DCM (Distributed Computing Module)
- Power Supplies

❷ Adjustable Folding Mirror

❸ AV6010 RangeFinder (with power supply)

❹ Tachometer

❺ VisionCapture / Image Depot Server (optional)

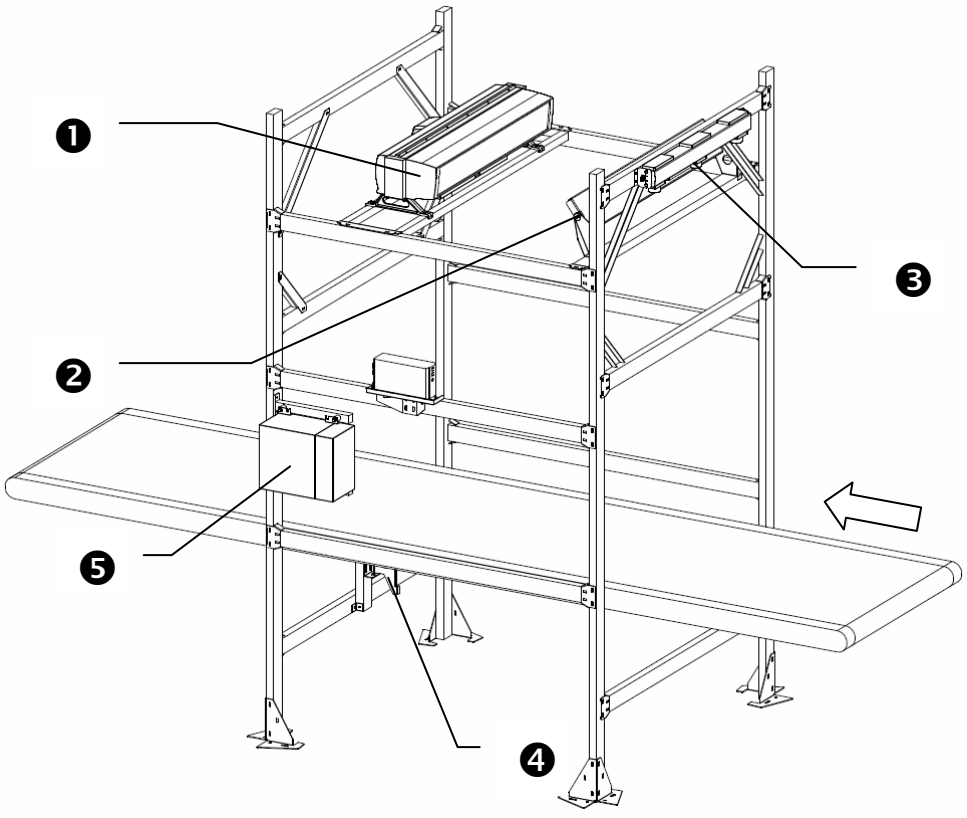


Figure 1-1: AccuVision AV6010 Long-Range Camera System

Camera Module

The camera module includes the following key components:

- LED Illumination
- Camera Head
- Distributed Computing Module (DCM)

Figure 1-2: AccuVision AV6010 Camera Module

The LED illumination floods the scanning area with light as packages are conveyed past the AV6010 camera(s). There are several models equipped with either a 30-inch [762 mm] or 42-inch [1066 mm] illumination module.

The AV6010's camera head acquires and transfers image data to the DCM for decoding and processing. The decoded results are then sent to a host device via Ethernet and/or serial interface.

Distributed Computing Module (DCM)

The DCM includes the main processor, up to three COM Express (COM-e) modules (one standard, used for bar code decoding), and all the Ethernet/serial and parallel communications interfaces required by the system.

The decoder (COM-e module 1) helps optimize your material handling system and improve your bottom line by:

- utilizing proprietary decoding software that all but eliminate no-reads regardless of orientation
- enabling easy setup, modification, and diagnostics of the most important application parameters and functionality
- provides a choice of serial or Ethernet communications with your host computer / network.

The optional COM-e modules are typically used for:

- Dimensioning / Certified Dimensioning applications (COM-e module 2)
- Raw Image Export (RIE) for Optical Character Recognition (OCR) applications (COM-e module 3)

The DCM also includes the following software:

- Lynx OS (real-time operating system for the main processor)
- Linux Operating System (on COM-e modules for decoding, dimensioning, RIE/OCR)
- AV6010 User Interface (HTML browser-based setup and diagnostics)
- AV6010 Install Wizard for auto-calibration (download to a computer)
- Proprietary decode software

RangeFinder Module

The RangeFinder module includes the following:

- RangeFinder Module
- RangeFinder Power Supply
- Mounting and adjustment brackets

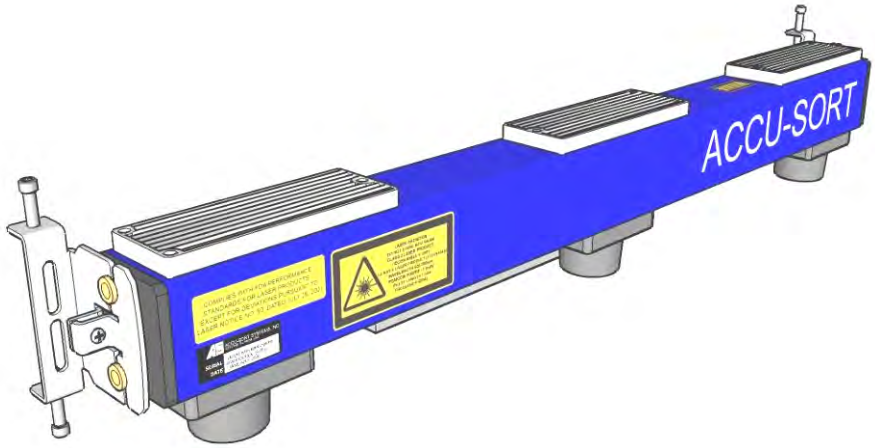


Figure 1-3: RangeFinder for AV6010 Camera Systems

The RangeFinder is used to detect the presence of products as they enter the scanning area as well as report the package positions/heights and sequence number to all cameras in the system. RangeFinders used in dimensioning are calibrated to have an accuracy of 0.1, 0.2 or 0.5-inch.

AV6010 User Interface

The AV6010 uses a browser-based application that lets you configure the system through a series of intuitive, user-friendly menus, tools and dialog boxes. Context sensitive help is available to assist with use of the application.

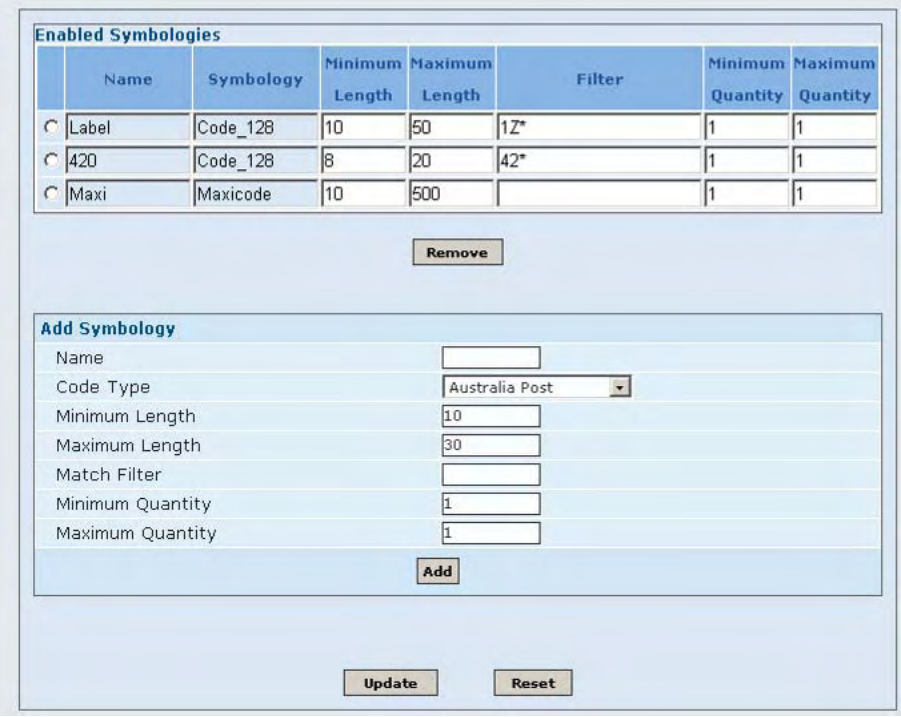


Figure 1-4: AV6010 User Interface (Symbologies Screen shown)

With the AV6010 user interface, you can:

- select or modify 1D and 2D symbologies to be decoded
- configure trigger and tracking parameters
- define communications and outputs
- monitor system performance
- diagnose and troubleshoot operating conditions

The user interface also includes a downloadable Auto-Calibration Wizard that enables static and dynamic setup of the RangeFinder and all cameras in the AV6010 system.

IMPORTANT: The user interface enables you to easily configure the AV6010 to your application's specifications. Making changes to certain parameters may adversely affect system performance. Observe the caution statements in this manual and do not make changes to those parameters unless instructed to do so by Accu-Sort Technical Support or your systems administrator.

Typical AccuVision AV6010 Long-Range Camera Applications

Use the AV6010 in the following AccuVision Long-Range Camera System applications:

- single-camera applications
- multiple-camera scanning arrays (3-sided)
- Complete camera scanning tunnels (up to 6 sides)
- quadrant scanning tunnels

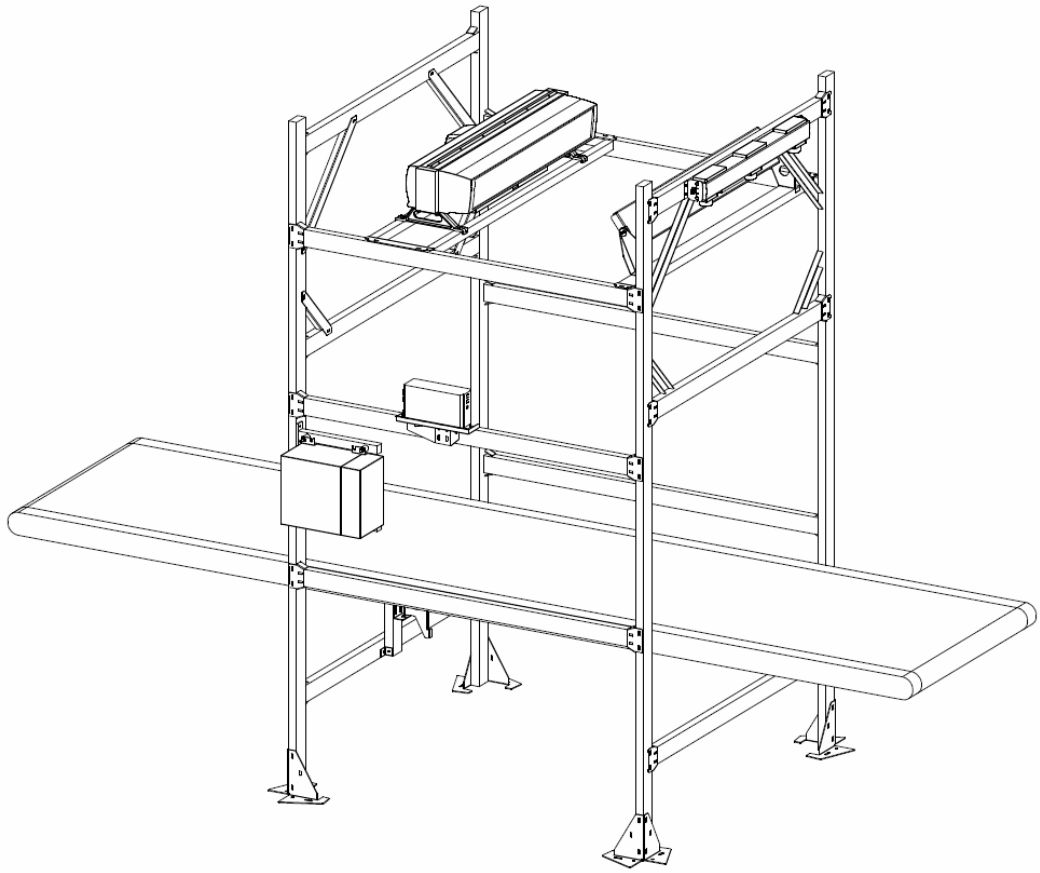


Figure 1-5: Top-read Single-camera Application

A three-sided scanning array is used to read bar codes on the top and sides of packages. When three or more cameras are used, a Power Distribution Box (PDB) is typically designed into the system.

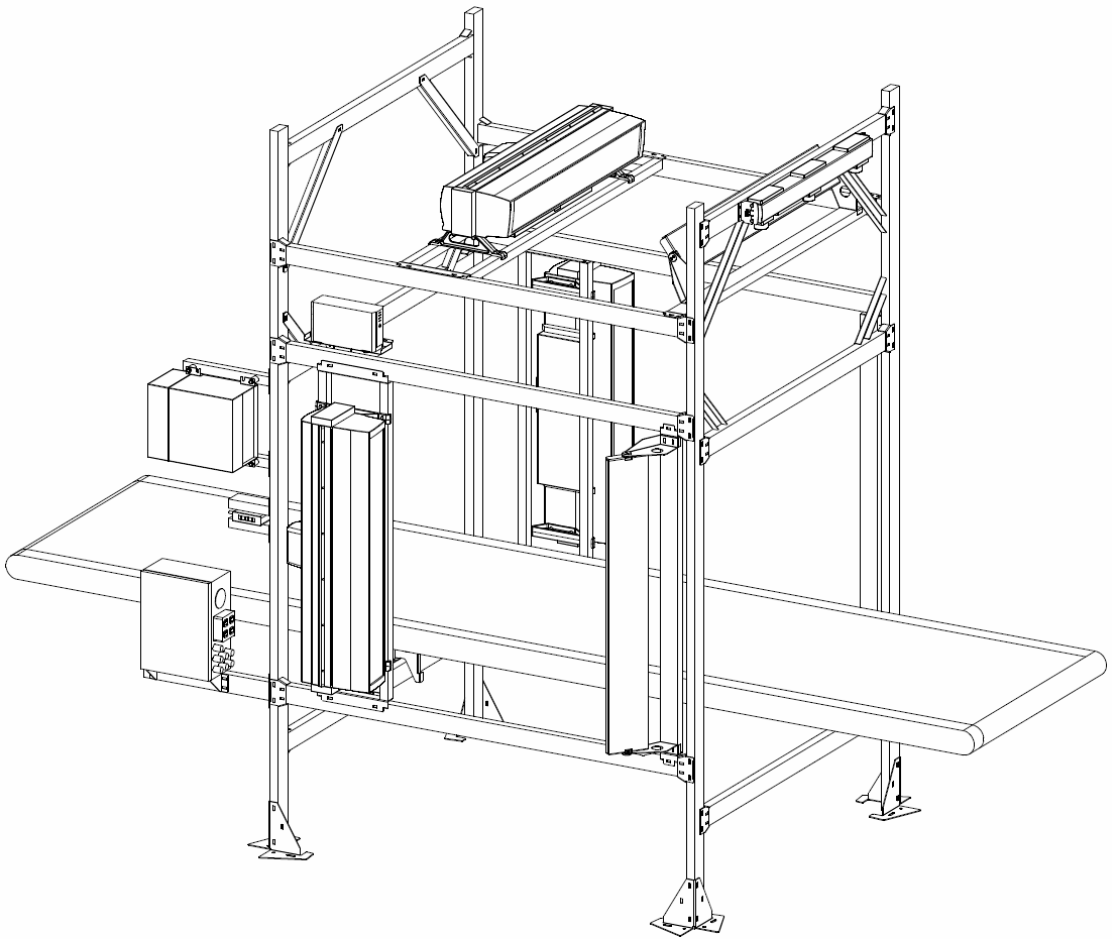


Figure 1-6: Scanning Tunnel – 3-Sided Application

A 5-sided or 6-sided scanning tunnel is used to read bar codes on most or all sides of the products passing through the tunnel, including the bottom of packages. *(See Figures 1-7 and 1-8.)*

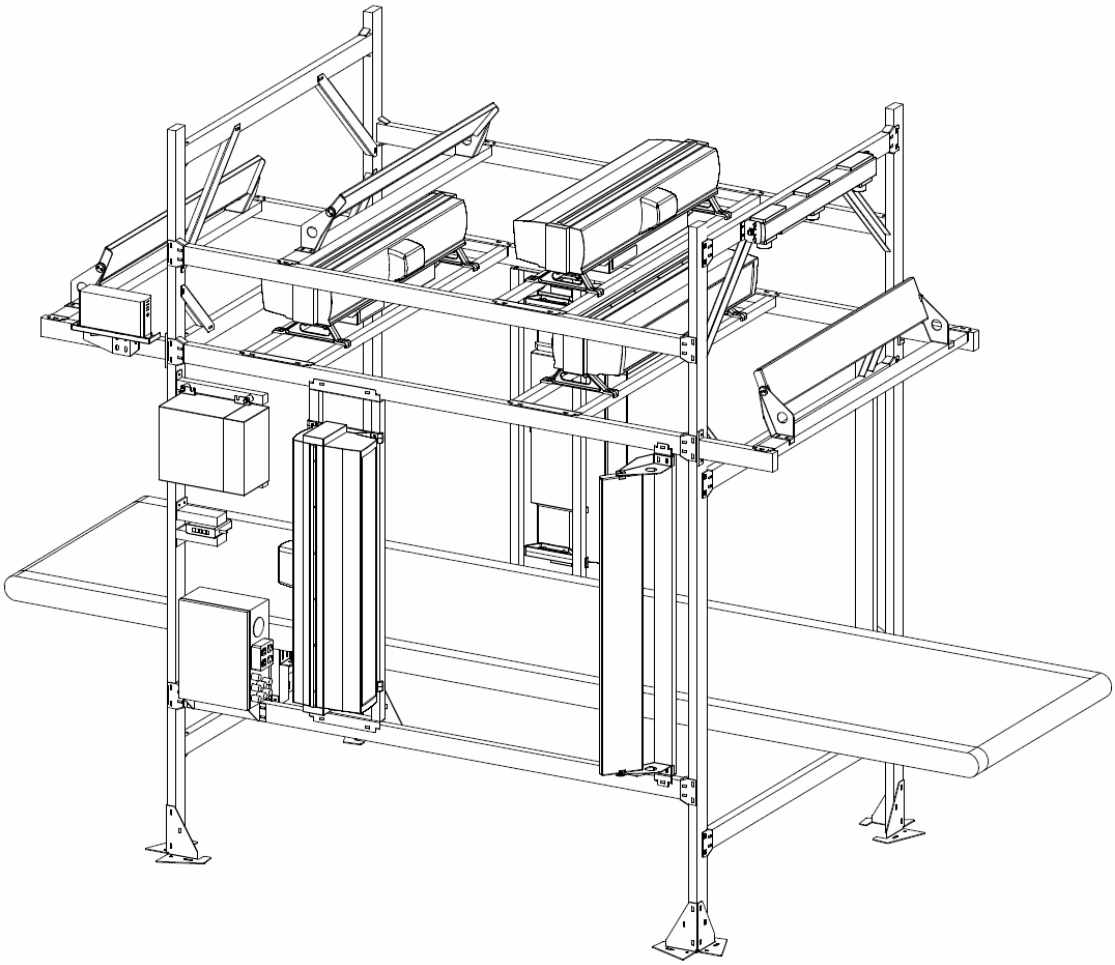


Figure 1-7: Scanning Tunnel – 5-Sided Application

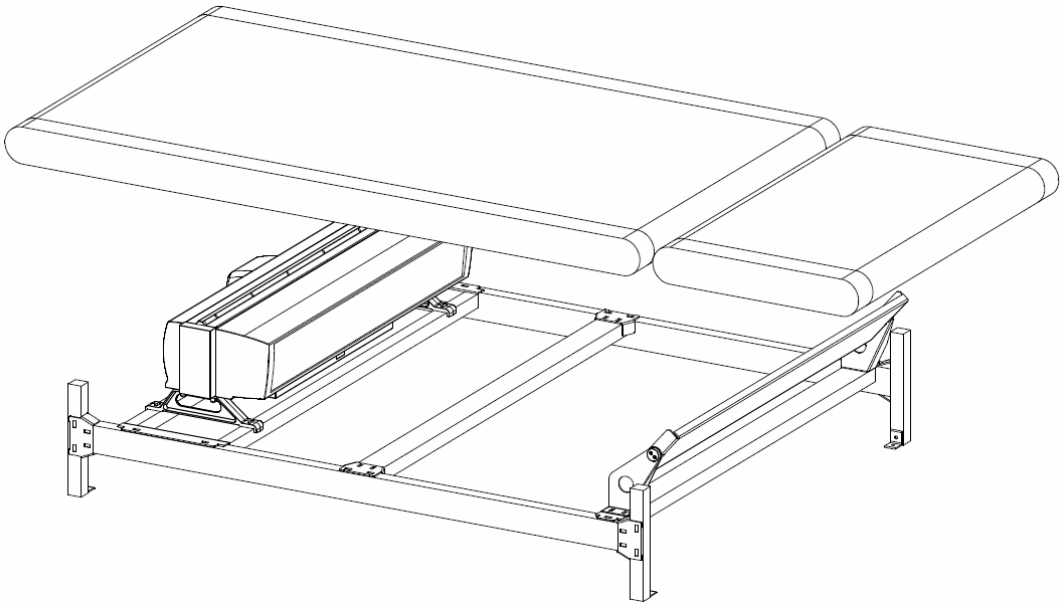


Figure 1-8: Tunnel Option – Bottom Read Application

Quadrant scanning is used to assure high read rates on higher-density bar codes when packages passing through the tunnel are significantly skewed.

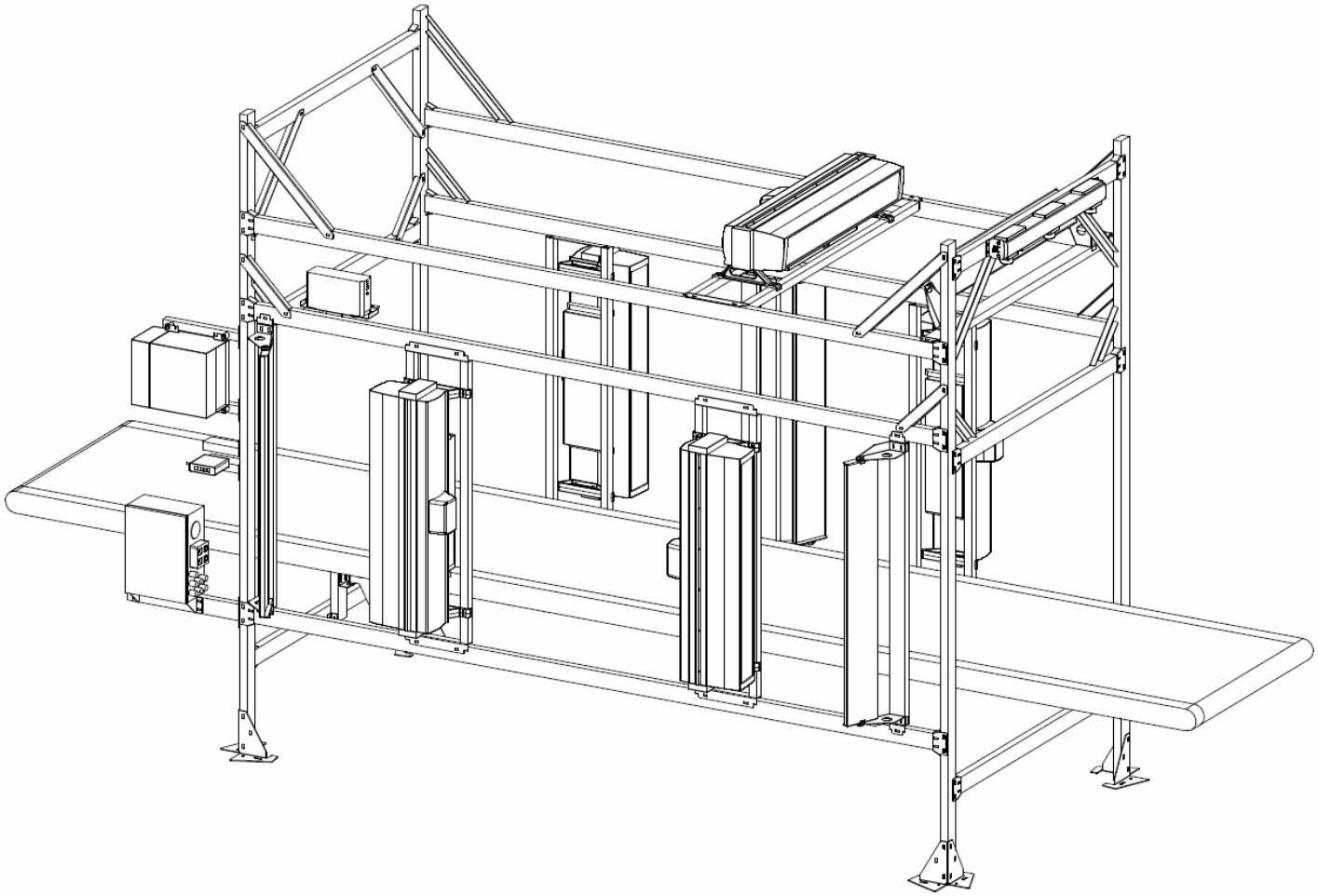


Figure 1-9: Quadrant Scanning Tunnel Application

Dimensioning Applications

Any AV6010 camera system with a top-read camera can be configured for the optional product dimensioning application. The DCM is equipped with a second COM-e module to enable the in-camera dimensioning functionality. The RangeFinder used in dimensioning applications is calibrated for an accuracy of 0.1”, 0.2” or 0.5” (2.54, 5.08 or 12.7 mm).

AV6010 with In-Camera Dimensioning Functional Overview

The AV6010 Camera System is designed to scan objects moving on a transport, decode bar code information and then present and transmit that information to another system (typically a sortation controller or inventory control system). The AV6010 Camera System includes all the hardware and software components needed to perform its function without requiring information or signals from external systems.

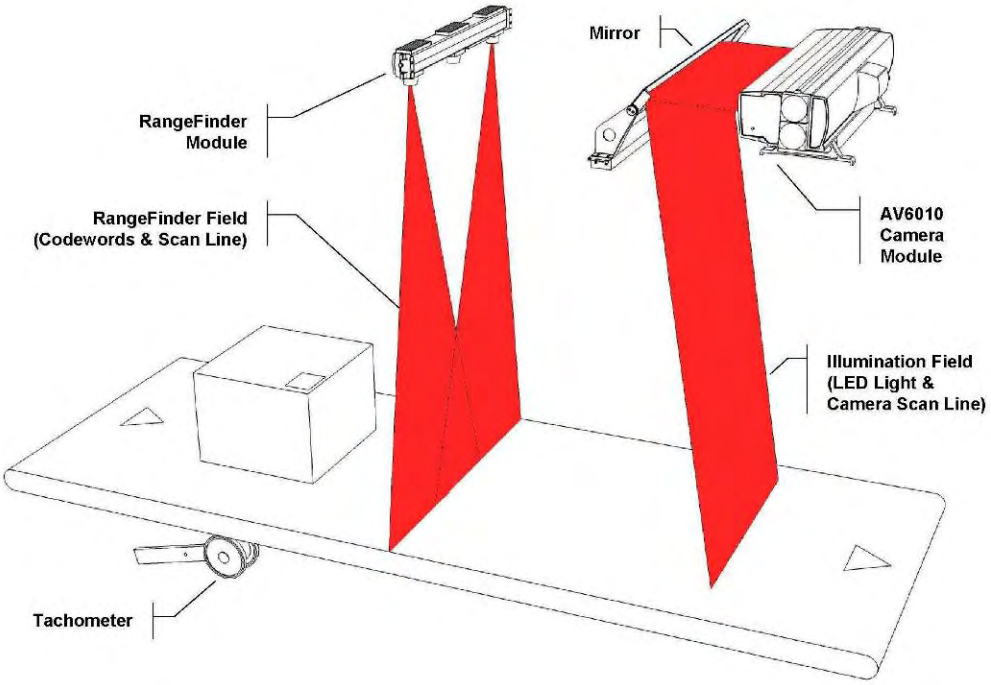


Figure 1-10: AV6010 Camera System Functional Diagram

An AV6010 Top-Read Camera and RangeFinder *(shown in Figure 1-10)* are needed for in-camera dimensioning. Objects are conveyed through the RangeFinder field. The RangeFinder detects the presence of an object and determines the range and extents of the object and transmits that information to the Camera Module. The AV6010 uses the signal from the tachometer to track the motion of the object through the field of view of the Main Imaging Sensor (commanding the Focus Servo as necessary to focus the Main Imaging Sensor). The AV6010 processes the resulting video data stream to locate and decode any bar code symbols present and then transmits that information to an external system when the object reaches a predetermined point (transmit point) along the conveyor system. When in-camera dimensioning is included in this system, the dimensioning data is also transmitted with the bar code data.

See *Appendix G* for further information on dimensioning.

RIE / OCR Applications

Any AV6010 camera system can be equipped with an additional COM-e module in the DCM to enable the optional RIE (Raw Image Export) for use in OCR (Optical Character Recognition) applications.

Side-by-Side Package Detection Applications

An AV6010 camera system can be registered to use the side-by-side package detection option. When enabled, the system uses a multi-dimensional approach to detect whether or not the packages passing through the scanning area are two or more items side-by-side, significantly reducing the potential for mis-sorts, mis-ships as well as package or transport damage. Side-by-side package detection works on both tilt-tray and belt conveyors.

Options and Accessories

Contact your sales representative for assistance in determining which options and accessories will be applicable to your application.

If you know which items are needed, contact:

Accu-Sort Systems, Inc.
Customer Service Department
(Ask for the *Spare Parts Coordinator*)
Hours: 8 AM and 4:30PM (EST) Monday through Friday

1-800-BAR-CODE™
(1-800-227-2633)
(Fax: 215-723-1515)

Notes:

2 Safety

Please follow the safety precautions and warnings found in this manual when installing, setting up, operating, maintaining, troubleshooting or replacing any Accu-Sort products, parts, or related equipment. Following these precautions will prevent personal injury or damage to the unit. Failure to follow these precautions may also void your warranty.

Symbols

Throughout this manual, special safety alerts are indicated by the following symbols:

WARNINGS or CAUTIONS: This symbol identifies a hazard or procedure that, if incorrectly performed, could cause personal injury or result in equipment damage.

HIGH VOLTAGE CAUTION: This symbol alerts the user they are about to perform an action involving, either a dangerous level of voltage, or to warn against an action that could result in damage to devices or electrical shock.

ESD CAUTION: This symbol identifies a procedure that requires you take measures to prevent Electrostatic Discharge (ESD) e.g., use an ESD wrist strap. Circuit boards are most at risk. Please follow ESD procedures.

Alerts help you to:

- Identify a hazard and its consequences
- Avoid a hazard by taking adequate safety precautions
- Get the most out of your bar code solution

General Precautions

Installation and Service by Qualified Service Technician Only

WARNING: Because of possible exposure to high voltage, a trained technician must perform all procedures involving exposure to the inside of the AV6010 Camera. There are no user-serviceable parts inside. Do not attempt to open the unit or perform any installation/service procedures unless you are a trained technician!

Refer all servicing and advanced troubleshooting to a qualified service technician. Technical training is available from Accu-Sort Systems.

Furthermore, even trained technicians should always reference the specific product service documentation for more detailed service procedures that are not described in the ***AV6010 Long-Range Camera System Manual***.

Unpacking, Mounting and Installation Recommendations

CAUTION: Firmly fasten mounting structures in place before installing the equipment to any mounting structure. Avoid using freestanding mounting structures. If your application requires a freestanding mounting structure, avoid making the structure top-heavy.

- Follow all procedures regarding electrical safety, laser safety, and electrostatic discharge safety (ESD) as outlined in this manual.
- Save all packing material in case you have to transport your AV6010.
- Use steel or aluminum as a mounting structure. An Accu-Sort mounting structure is recommended for optimum system performance.
- Check mounting hardware periodically for tightness and stability.
- Do not use sheet rock, plaster board, wood, or other unstable mounting surfaces.
- Do not use mounting surfaces that are subject to high vibrations.
- Do not create any obstructions of airflow around the equipment. Keep the area around the equipment clean to provide for cooling. (Refer to specific product manuals for minimum clearances.)
- Avoid dropping the unit(s) during unpacking and installation.
- Do not touch the window glass of the RangeFinder, camera or mirror.

Compliance Requirements

FCC NOTICE: The AV6010 Camera has been tested and found to comply with the limits for a Class A digital device, pursuant to *Title 47, Part 15* of the *FCC Rules*. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manuals, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense.

WARNING: These are Class A products. In a domestic environment, these products can cause radio interference, in which case the user may be required to take adequate measures. (Ref. CISPR 22 = EN 55 022:1995.)

IMPORTANT: Follow the guidelines below to maintain Electromagnetic Compatibility (EMC) Compliance:

- Interconnecting cables must be twisted pair cables.
- All shielded I/O cables shall have the shield terminated to the chassis.
- **NOTE: DRAIN WIRE SHIELDING IS NOT ADEQUATE.**
- Do not remove the shielding covers.
- Refer to the details on making custom cables as provided in the specific technical manual for the component.

Electrical Safety

AV6010 Camera must be installed in accordance with Canadian Electrical Code, Part I, CSA C22.1; CSA C22.2 No. 0; and the National Electrical Code, NFPA 70. For complete requirements, National Electrical Code, ANSI/NFPA 70, Canadian Electrical Code, Part I, C22.1, or other national standard must be consulted.

- **For PERMANENTLY CONNECTED EQUIPMENT/RACK MOUNTED, incorporate a readily accessible disconnect device in the fixed wiring.**
- **For PLUGGABLE EQUIPMENT/RACK MOUNTED, install the socket-outlet near the equipment so it is easily accessible.**
- Make sure that all personnel who work with the equipment know where the disconnect switches or circuit breakers are located.
- Before performing any type of maintenance, turn off power to the unit and disconnect the power cord.
- Be certain your hands and the floor of your work area are dry before touching electrical equipment or connecting cords.
- Routinely check all power cords, plugs, wiring, and cable connections for any signs of exposed wire or deteriorating insulation. If you notice any damage, make arrangements with service personnel to repair or replace the damaged item immediately.

Electrical Grounding Requirements

Before applying power to any device, ALL components MUST be electrically grounded. Follow these precautions:

- Ensure all AC power outlets have a properly grounded receptacle.
- ALL components MUST be properly cabled and grounded with three-conductor AC power cords.
- Use the correct power cord for your country.
- Reference specific grounding instructions for each component.
- Do not use a two-prong adapter.
- Do not cut/remove the round grounding prong from any plug.
- Do not use an extension cord to defeat any ground.

Electrostatic Discharge

ESD CAUTION: Measures must be taken to prevent Electrostatic Discharge (ESD) at all times when handling any product, equipment, unit or part (e.g. use a grounded ESD wrist strap). It should be noted that circuit boards are at greatest risk to damage from ESD. Please follow standard ESD precautions!

Electrostatic discharge (ESD), the transfer of static electricity from one object to another, is an often-unnoticeable hazard to electronic components. Boards and other devices with integrated circuits are particularly sensitive to ESD damage. Product failures may not occur until days or weeks after the component was damaged.

Static damage to units can take the form of upset failures or catastrophic failures (direct and latent).

An upset failure occurs when an electrostatic discharge is not significant enough to cause total failure, but may result in intermittent gate leakage, causing loss of software or incorrect storage of information.

Direct catastrophic failures occur when a unit is damaged to the point where it is permanently damaged.

Basic Rules for ESD Control

Below are some keys to effectively control unnecessary ESD damage when working with ESD-sensitive devices:

- Define an ESD protective area and work on the ESD-sensitive devices in this area only.
- Define static sensitivity of devices to be handled in ESD protective area.
- Establish suitable static control program that limits static generation to less than the damage threshold of the most sensitive device in the environment, and provides a safe, defined path for static charge dissipation.
- Prevent contamination of the protective area by unnecessary non-static controlled materials.
- Audit the ESD protective area regularly to ensure that static control is maintained. Document the findings for future reference.
- Refer to the specific electrostatic discharge precautions for each component.

Laser/LED Safety

The **AV6010 Camera Module** uses visible red LEDs to create an “area flood pattern.” Do not stare into the camera’s exit window at the LED light. Avoid direct eye exposure. The LED light level does not constitute a health hazard, however staring at the LED light for prolonged periods could result in eye damage.

The AV6010 RangeFinder Module uses visible red lasers emitting from the left and right apertures to create a unique pattern used in detecting the presence of a product in the scanning area and for measuring the width of products.

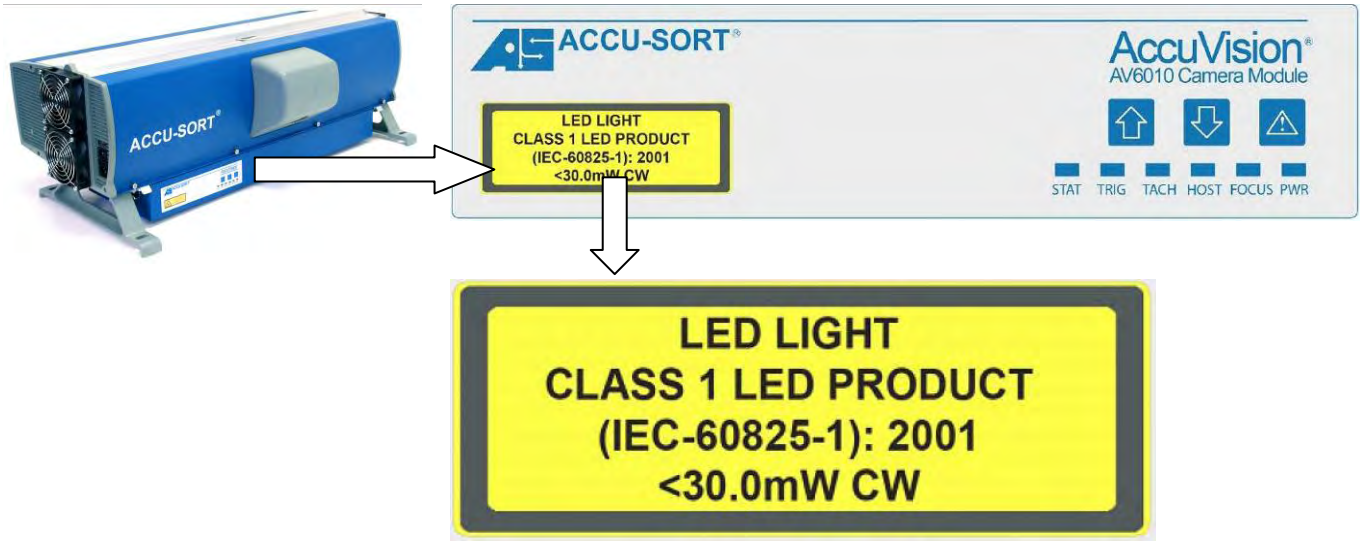
WARNING: Use of controls, adjustments, or procedures other than those specified in this document may result in hazardous laser light exposure. The AV6010 RangeFinder Module is rated as a Class 2 Laser Product by the International Electrotechnical Commission.

Compliances are as follows: Class 2 Laser Product (IEC/EN 60825-1):2001, Class II Laser Product (21CFR1040) <1.0 mW peak/cw power at wavelength 630-700nm.

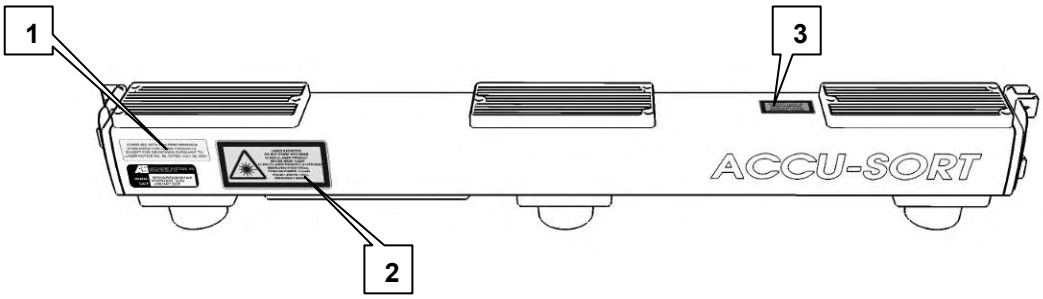
Safety Labels and Locations

Refer to the following figures for specific label locations and warnings. When operating, repairing, or replacing any AV6010 Camera Module or RangeFinder Module field replaceable units, note all label content on the unit. These labels provide special precautions for operation, usage specifications, product identification, and service information.

AV6010 Camera Module Safety Label Locations



AV6010 RangeFinder Module Safety Label Locations



1

COMPLIES WITH FDA PERFORMANCE STANDARDS FOR LASER PRODUCTS EXCEPT FOR DEVIATIONS PURSUANT TO LASER NOTICE NO. 50, DATED JULY 26, 2001

2

LASER RADIATION
DO NOT STARE INTO BEAM
CLASS 2 LASER PRODUCT
(IEC/EN 60825-1):2001
CLASS II LASER PRODUCT (21CFR1040)
WAVELENGTH 630-700nm,
PEAK/CW POWER <1.0mW
PULSE LENGTH 1.0ms,
FREQUENCY 500Hz

3

CAUTION - CLASS 3B
LASER RADIATION
WHEN OPEN. AVOID
EXPOSURE TO BEAM

3 Mechanical Installation

IMPORTANT: The AV6010 contains electronics that may be affected by electrostatic discharge (ESD). To prevent personal injury or damage to the unit, please follow the safety precautions and warnings found in *Chapter 2*. Failure to follow these precautions may void your warranty.

Preparing for Mechanical Install

IMPORTANT: Application-specific drawings and documents provided by Accu-Sort supersede any contradictory content in this manual.

Before mounting any components, please do the following:

- Read all instructions before beginning your installation.
- Define and confirm the accuracy of your application's requirements and structure position, especially the height of the conveyor from the floor.
- Review all installation-specific drawings provided with your equipment.
- Review and plan the mechanical installation of all devices used in your application. Be sure to allow adequate clearance for maintenance.
- Review and plan the power requirements for your application.
- Check the contents of the shipping cartons against the packing list.
- Record all product serial numbers.

IMPORTANT: The camera system requires a consistent transport speed and precisely timed triggering events in order to function properly. All packages must enter and exit the scanning area at constant transport speed. Variations in speed during scanning / processing will adversely affect the system's read rate performance and may also result in inconsistent communications with the host computer.

Unpacking Instructions

IMPORTANT: The AV6010 Camera and RangeFinder packaging is designed to protect the unit(s) during shipment. Do not throw it away. Save all packing material in case you need to transport your unit(s).

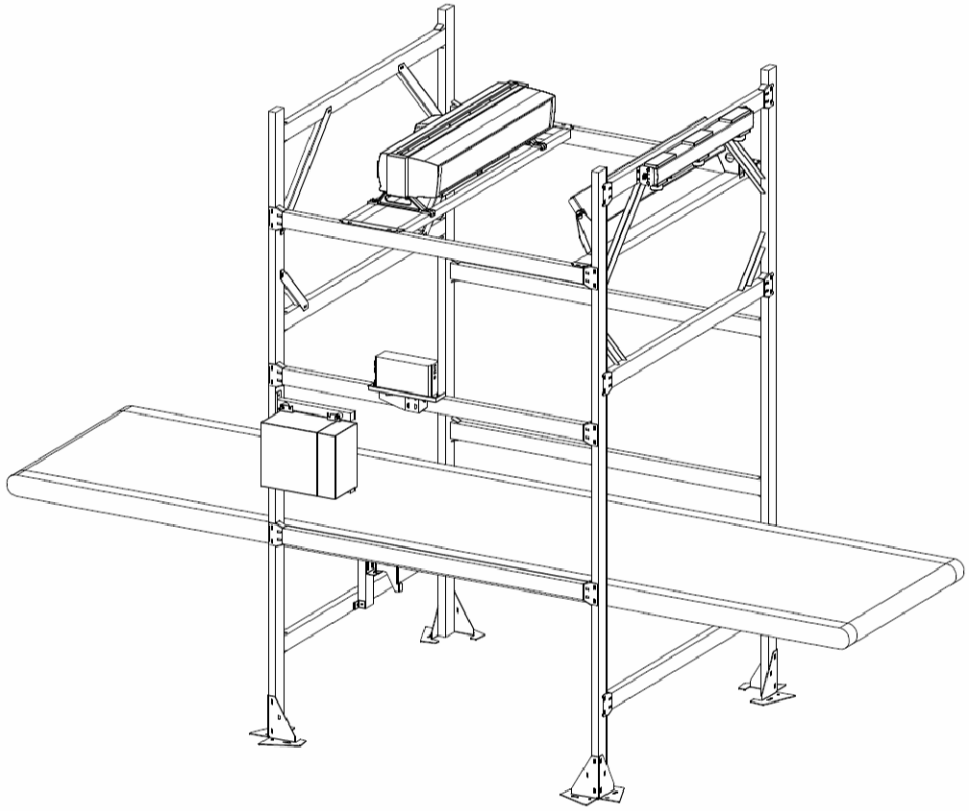
Installation Sequence

NOTE: Everything should be **MECHANICALLY INSTALLED** before performing any **ELECTRICAL INSTALLATION**. See *Chapter 4* for electrical installation details.

Installing a Single Camera System

To install a single camera system, follow this sequence of steps:

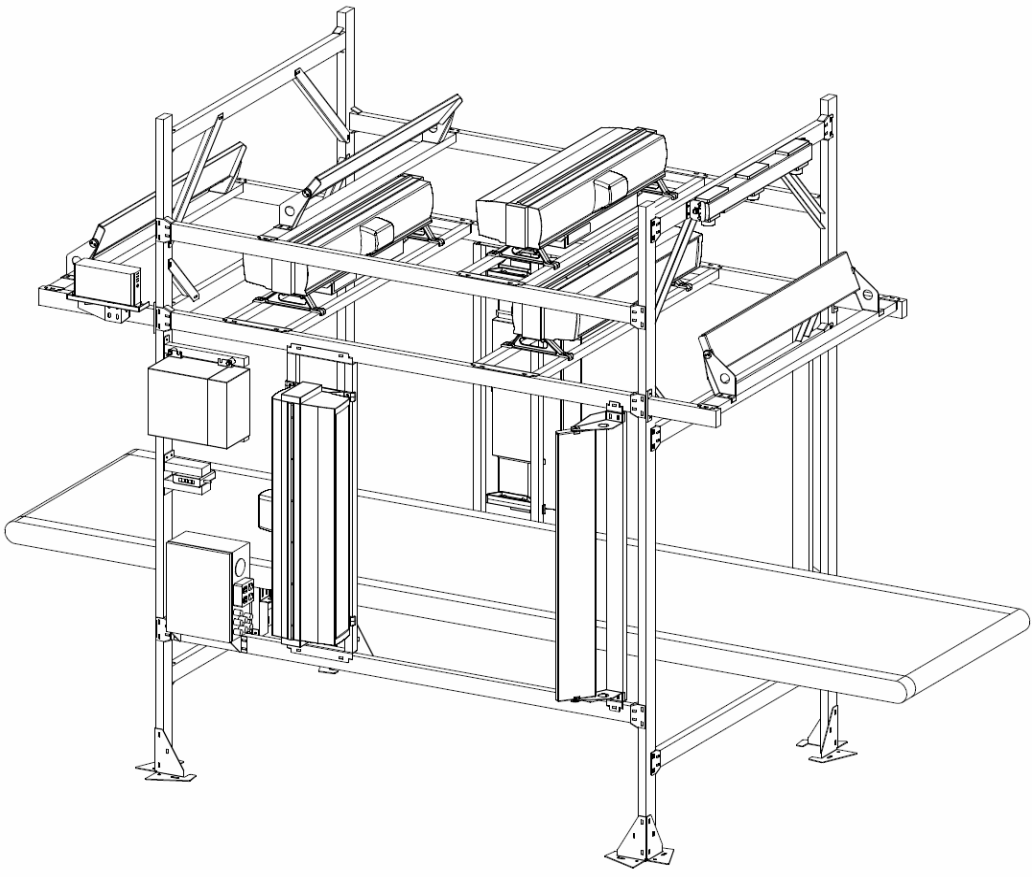
- **Complete mechanical installation.**
  - Review the details of your application's requirements.
  - Determine and mark the mounting location.
    If an Accu-Sort structure is used, mounting locations are pre-marked.
  - Erect mounting structure or other supporting frame.
  - Mount AV6010 Camera and mirror in its position on the structure.
  - Mount AV6010 RangeFinder in its position on the structure.
  - Mount / position any optional devices included with your system.
    - VisionCapture Image Capture System including network switch, monitor/keyboard with trackball and mounting arm, UPS
- **Complete electrical installation**. *(See Chapter 4.)*
- **Setup your AV6010.** *(See Chapter 5.)*
- **Check operations.** *(See Chapter 6.)*



Installing a Multiple Camera Tunnel

To install a multiple camera system, follow this sequence of steps:

- **Complete mechanical installation.**
  - Review the details of your application's requirements.
  - Determine and mark the mounting location.
    If an Accu-Sort structure is used, mounting locations are pre-marked.
  - Erect mounting structure or other supporting frame.
  - Mount AV6010 Cameras/mirrors in their positions on the structure.
    - Front/Top/Back cameras
    - Side cameras
    - Bottom camera *(if applicable)*
  - Mount AV6010 RangeFinder in its position on the structure.
- Mount Power Distribution Box to the structure.
- Mount / position any optional devices included with your system.
  - VisionCapture Image Capture System including network switch, monitor/keyboard with trackball and mounting arm, UPS
- **Complete electrical installation**. *(See Chapter 4.)*
- **Setup your AV6010.** *(See Chapter 5.)*
- **Check operations.** *(See Chapter 6.)*



General Mounting Guidelines

As you plan the installation of the AV6010 Camera(s) and RangeFinder, be sure to keep the following guidelines in mind:

- Determine the proper AV6010 orientation and position as it relates to the scanning area and transport direction.
- With the exception of lifting the AV6010 camera(s) into position on the mounting structure, all mounting structure assembly and equipment installation can be performed by one installer.
- Applications using an Accu-Sort mounting structure define the AV6010 location on the application-specific drawings provided with your system and are pre-marked on the structure.
- Plan your mechanical installation based on the application's electrical requirements. *See Electrical Installation Guidelines in Chapter 4*.

It is important that you follow all safety precautions when installing, setting up, operating, maintaining, troubleshooting or replacing any Accu-Sort products, parts or related equipment. *See Chapter 2, Safety*.

Dimensions and Clearances

The mechanical specifications, dimensions and mounting footprint for the AV6010 Camera and RangeFinder are provided in *Appendix A*.

NOTE: For installation, wiring, maintenance and service reasons, allow for proper clearance. Ease-of-access should also be considered when locating the mounting position. Clearances recommended (approximate):

▪ Camera & RangeFinder Connector Panel	6 inches [152 mm]
▪ Camera Cover / Access Panel	8-12 inches [203-305 mm]
▪ Power Distribution Box (PDB) *(used with multi-camera systems)*	42 inches [1066 mm] deep 30 inches [762 mm] wide 78 inches [1981 mm] headroom

Physical Support Requirements

For details on the weight of the AV6010 Camera and RangeFinder, see *Appendix A*. Multiple-camera systems and scanning tunnels may include further details on the physical support requirements with any application-specific documentation provided.

Vibration Limitations

The AV6010 Camera and RangeFinder are designed and tested to withstand continuous sine wave vibrations between 10 and 500 hertz (limited to a displacement of 0.0157 inches [0.40 mm] for frequencies between 10 and 50 Hz and limited to 2 G acceleration for frequencies between 50 and 500 Hz).

Mounting Structure Assembly

When a mounting structure is supplied by Accu-Sort, a set of drawings is provided that supplies details specific to the applications. Accu-Sort mounting structures are designed to support from one to six cameras in a tunnel configuration. These structures can be assembled by a single installer.

Prerequisites:

- Receipt, inventory and staging of structure materials
- Conveyor location prepared for structure installation

You will need the following:

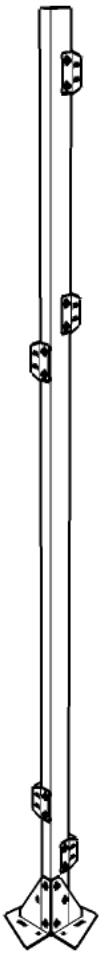
- Application's specifications defining proper location of structure
- Custom mounting structure drawings *(if a standard is not used)*

Tools Required:

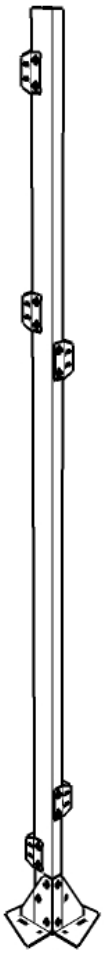
- Socket Driver (1/2") (*battery powered, recommended)*
- Tape Measure (*verify drawing to application, recommended)*

To assemble the mounting structure:

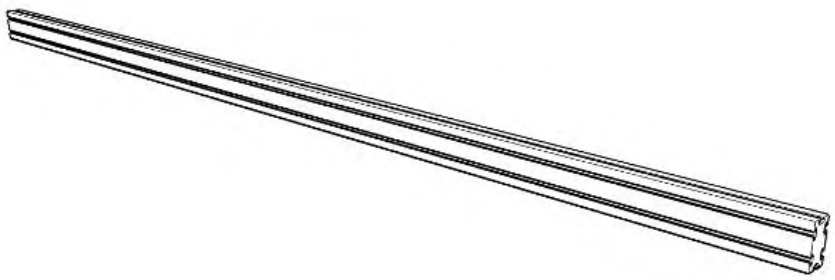
1. Prepare the conveyor location for the structure.
2. Inventory and stage the structure components.
3. Position pre-assembled back columns.
4. Position pre-assembled front columns.
5. Install lower side rails.
6. Install upper side rails.
7. Install bottom cross members.
8. Install middle cross members.
9. Install top cross members.
10. Install left and right side corner braces.
11. Install front and back corner braces.
12. Install inner side rails (if applicable).



Column Type 1 (qty. 2)
Right back / Left front

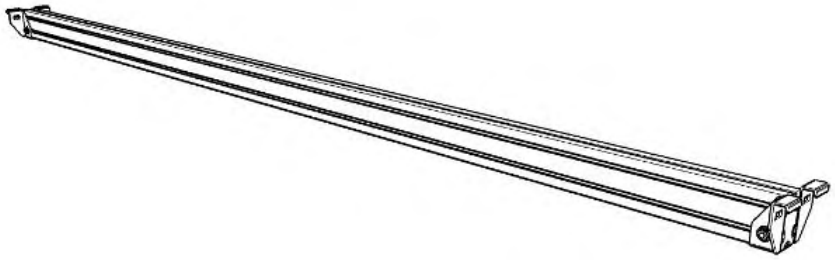


Column Type 2 (qty. 2)
Left back / Right front



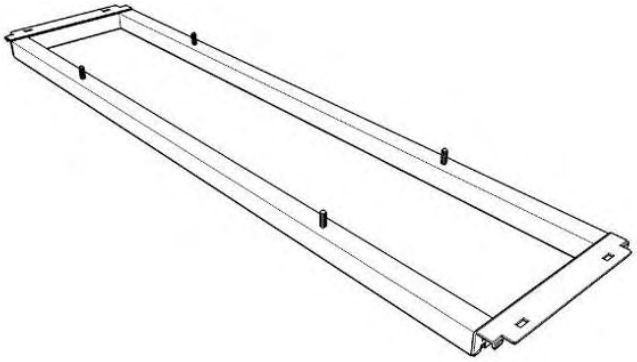
Side Rails (qty. 4) – Long, unmarked

Cross Members (qty. 6) – Short, pre-marked

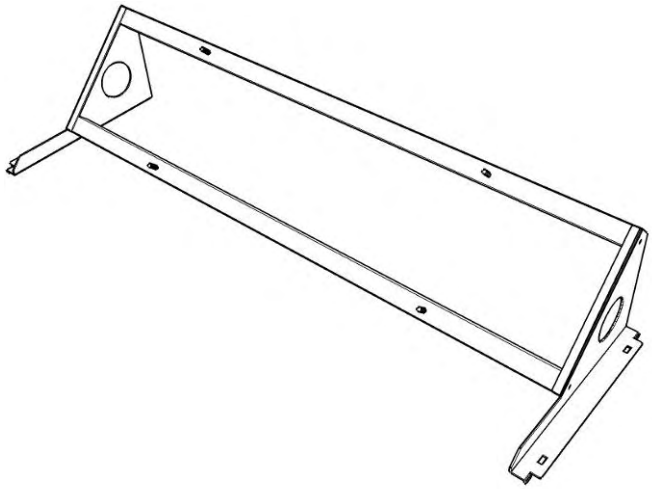


Inner Side Rails (qty. 2 or 4) – Long, pre-marked *(optional)*

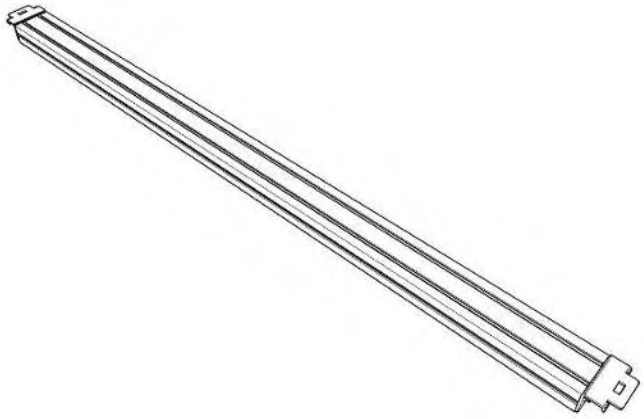
Mounting Structure Components



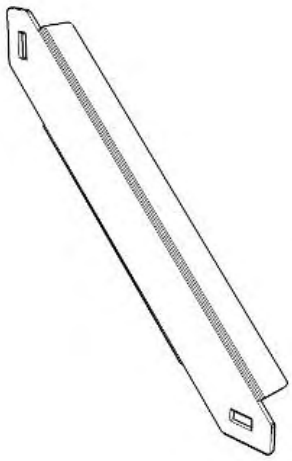
Flat Camera Sleds (qty. 1 per camera)



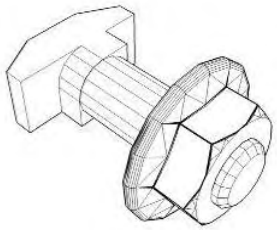
45-degree Camera Sleds
(optional, used in place of flat sled and mirror/sled)



Mirror Sleds (qty. 1 per camera)
(Use with all cameras that have a flat sled.)



Corner Braces (24-inch & 36-inch) (qty. 4 each)

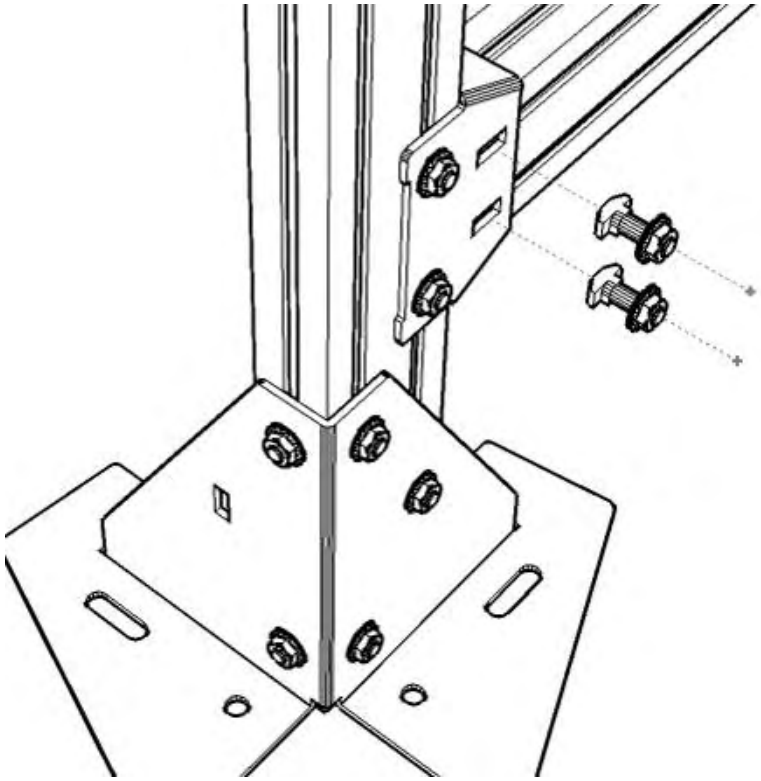


(enlarged view)

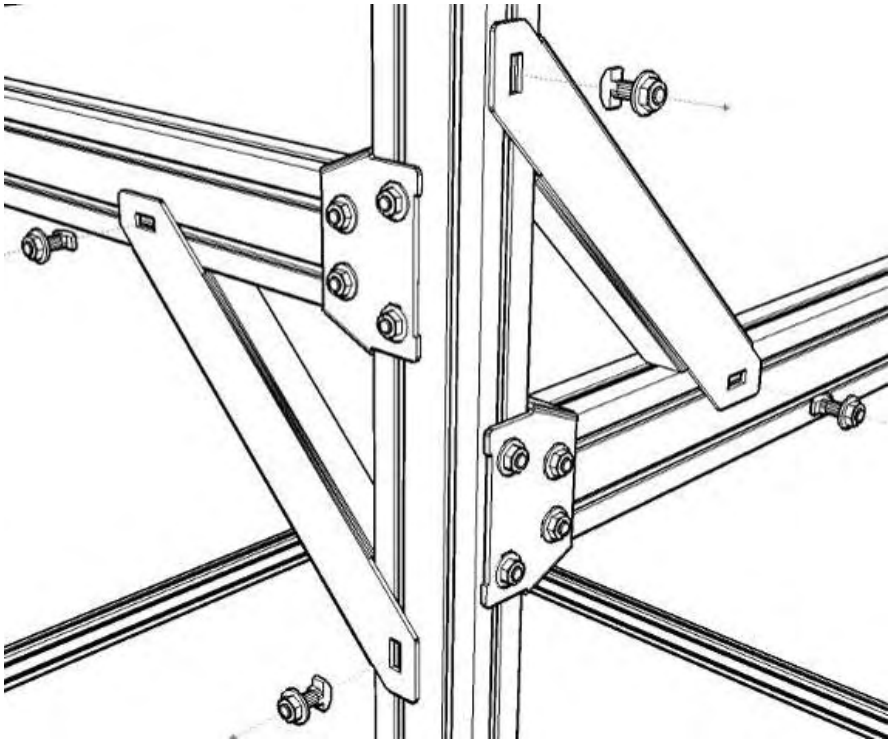
T-Stud and Flanged Nut
(pre-assembled, bulk quantity, large bag)

Note: *Applications using optional equipment (e.g., power distribution box, VisionCapture™ Image Depot Server, monitor and keyboard) will have additional mounting structure components. Review your installation drawings to confirm the options used in your application.*

Mounting Structure Components *(continued)*



Assembly of side rails and cross members to columns
Reference drawing 110425 for details on the mounting base (foot))



Installation of corner braces

Equipment Mounting

Complete camera system equipment installation:

- Camera Module(s) *(up to 6)*
- Focus Mirror(s) *(up to 6)*
- RangeFinder Module
- Tachometer
- Power Distribution Box
- Others (Options)

NOTE: If your application uses an Accu-Sort mounting structure, the positions of the RangeFinder, camera sleds and mirror sleds are pre-marked to simplify installation.

Prerequisites:

- Structure installation completed
- Structure drawings (standard or custom) showing proper positioning of equipment on the structure
- Application's specifications

Tools Required:

- Socket Driver (1/2") (*battery powered, recommended)*
- Allen Wrench (5/32")
- Tape Measure (minimum 12 to 25-feet [3.65 to 7.62 meter])

Camera Installation

Prerequisites:

- A flat surface (preferably the conveyor belt)
- Application specifications and mounting structure drawings
- Determine camera position and reading direction

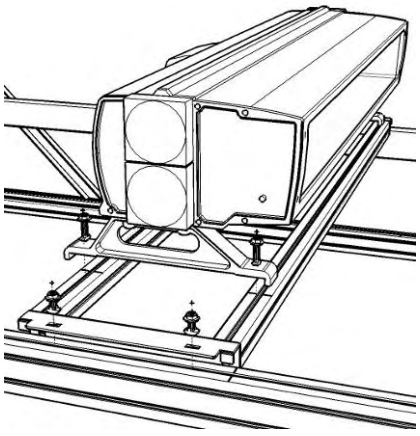
Tools Required:

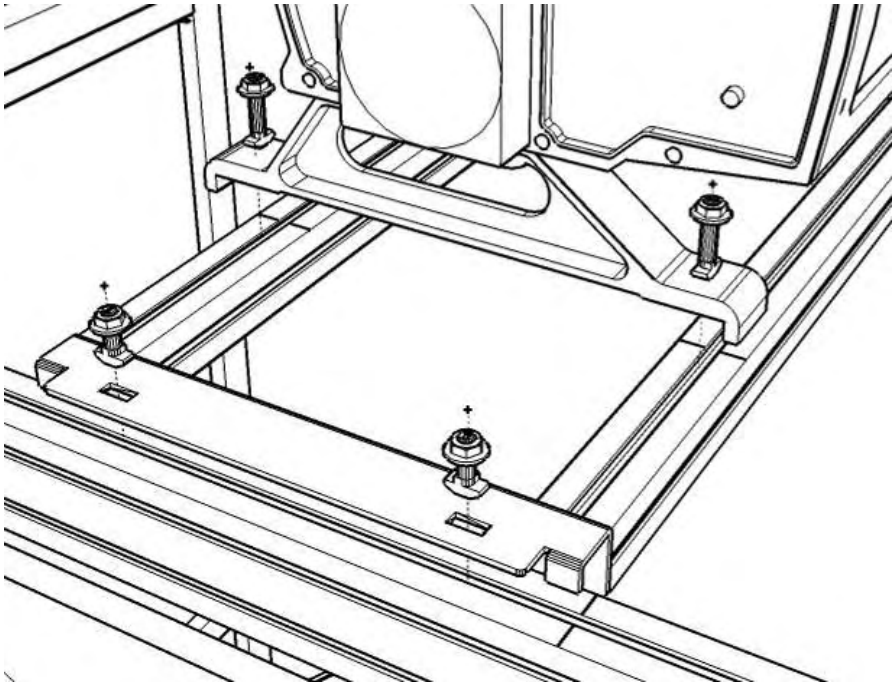
- Socket driver (1/2") *battery powered (recommended)*
- Tools (optional): Tape measure

To install a Front/Top/Back camera:

1. Place the camera on the sled, aligning the camera mounting feet with the alignment marks.
2. Attach with front-loading hardware. Do not over-tighten, which allows for adjustment during setup (if necessary), but assure the camera will not slide in the sled's channel when it is lifted into position.
3. Assure camera is positioned with illumination side facing in the correct direction before lifting into position.
4. Use two people to lift the camera/sled assembly into position as marked on the structure side rails.
5. Attach with front-loading hardware. Do not over-tighten.

IMPORTANT: For safety reasons, it is recommended that two people lift the camera into position on the mounting structure.



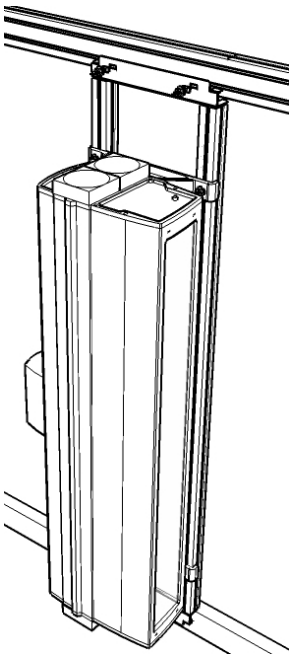


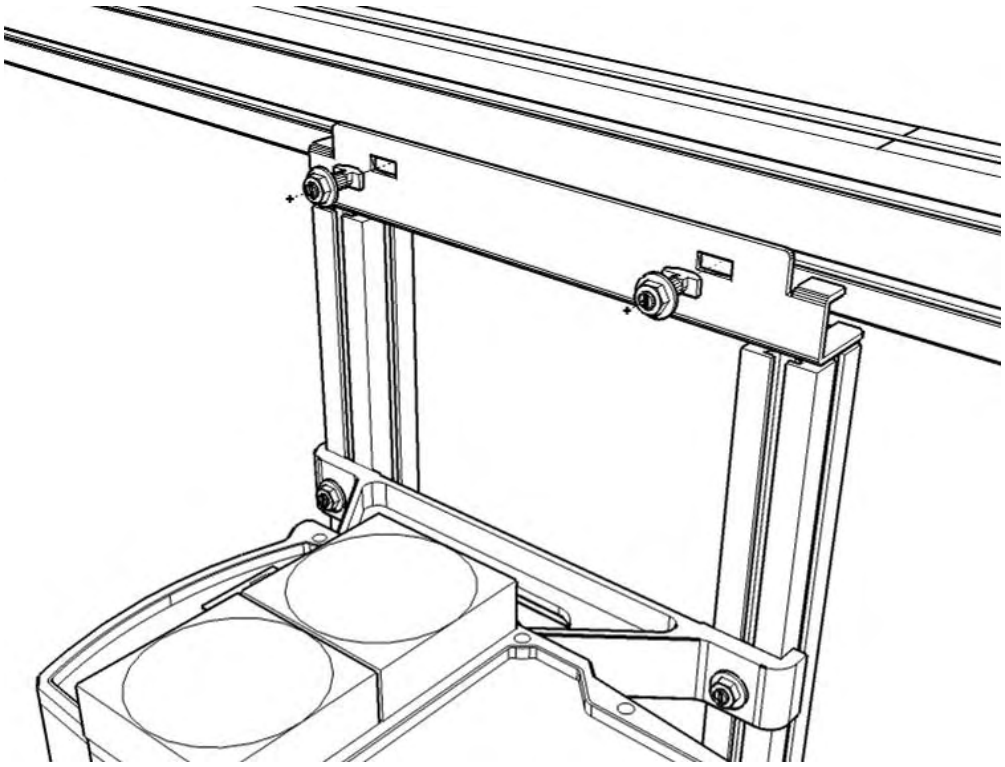
To install a Side/Quadrant camera:

IMPORTANT: Depending on the application, the side-read camera may be installed on the inside of the mounting structure rather than the outside. Check your application structure drawings before mounting the side-read camera or mirror.

1. Place the camera on the sled, aligning the camera mounting feet with the alignment marks.
2. Attach with front-loading hardware. Do not over-tighten, which allows for adjustment during setup (if necessary), but assure the camera will not slide in the sled's channel when it is lifted into position.
3. Assure camera is positioned with illumination side facing in the correct direction before lifting into position.
4. Use two people to lift the camera into position as marked on the structure side rails. Insert the tabs of the sled's upper bracket into the structure channel, and then slowly rest the lower bracket into position.
5. Attach with front-loading hardware, beginning with the sled's upper bracket. Do not over-tighten.

IMPORTANT: For safety reasons, it is recommended that two people lift the camera into position on the mounting structure.

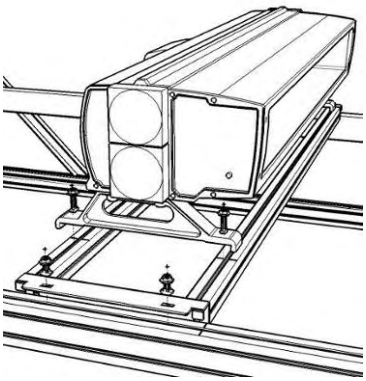


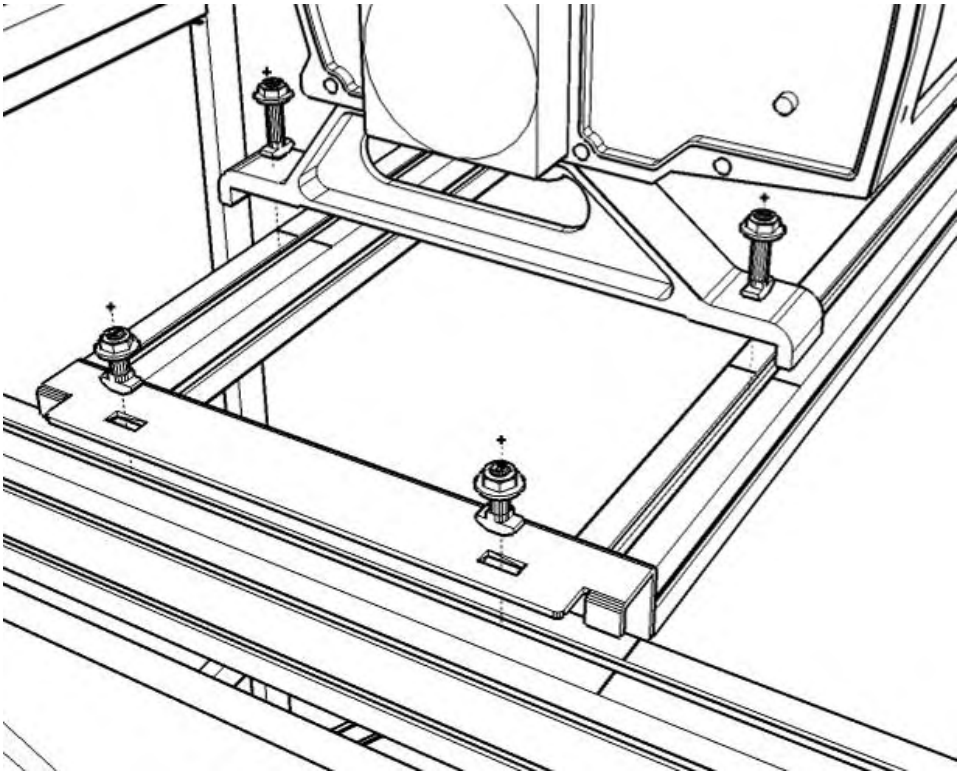


To install a Bottom-read camera:

1. Underneath the conveyor, place the camera on the sled, aligning the camera mounting feet with the alignment marks.
2. Attach with front-loading hardware. Do not over-tighten, which allows for adjustment during setup (if necessary), but assure the camera will not slide in the sled's channel when it is lifted into position.
3. Assure camera is positioned with illumination side facing in the correct direction before lifting into position.
4. Use two people to lift the camera/sled assembly into position as marked on the structure side rails.
5. Attach with front-loading hardware. Do not over-tighten.

IMPORTANT: For safety reasons, it is recommended that two people lift the camera into position on the mounting structure.





Mirror Installation

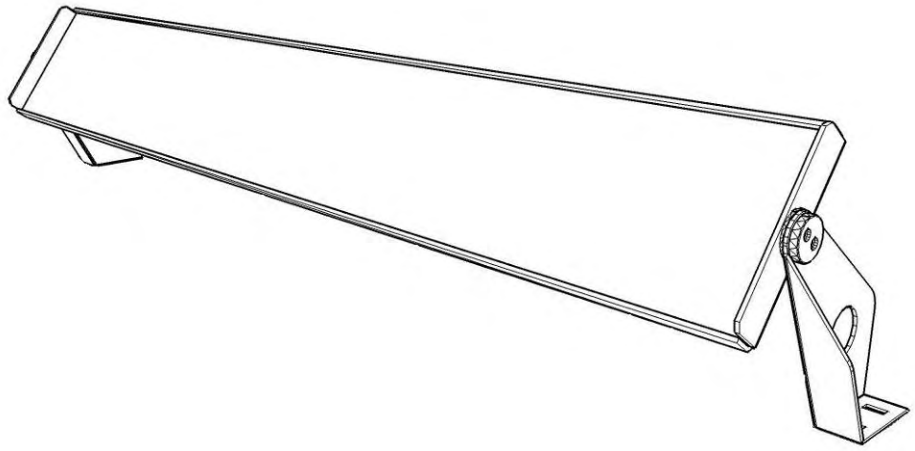
Prerequisites:

- A flat surface (preferably the conveyor belt)
- Application specifications and mounting structure drawings
- Determine mirror position as it relates to the camera and reading direction
- Remember: Mirrors must be angled toward the conveyor. *(Mirror adjustment to the correct angle is covered in Chapter 5.)*

Tools Required:

- Socket driver (1/2”) *battery powered (recommended)*
- Tools (optional): Tape measure

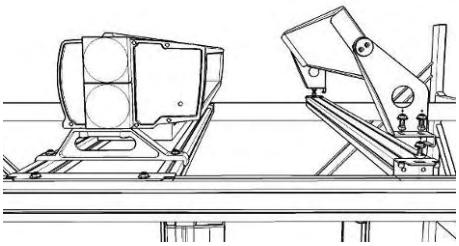
The mirror assembly ships pre-assembled. If not, attach the brackets to both sides of mirrors before proceeding to the next step.

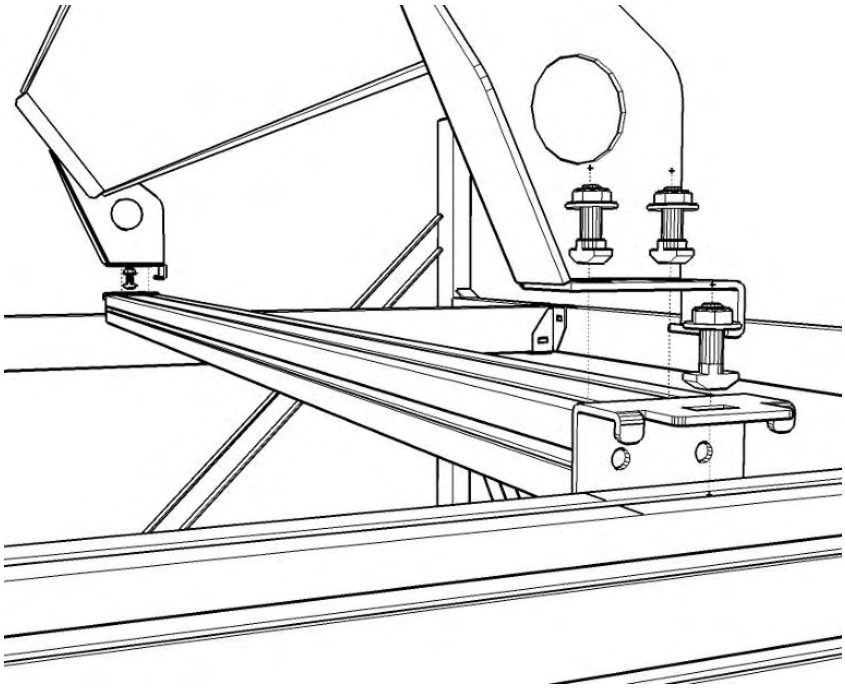


To install a mirror for a Front/Top/Back camera:

1. Place the mirror assembly onto the mirror sled in the position marked. *(Some mirror sleds are the same length as the mirror assembly, in which case there will be no marks.)*
2. Attach with front-loading hardware. Assure the mirror will not slide in the sled's channel when moved into position on the structure. Do not over-tighten, which allows for adjustment during setup, if necessary.
3. Assure mirror is positioned facing in the correct direction.
4. Lift mirror into position as marked on the mounting structure.
5. Attach with front-loading hardware (do not over-tighten).

IMPORTANT: Do not remove the protective film from the mirror's surface until system setup and calibration. *(See Chapter 5.)*



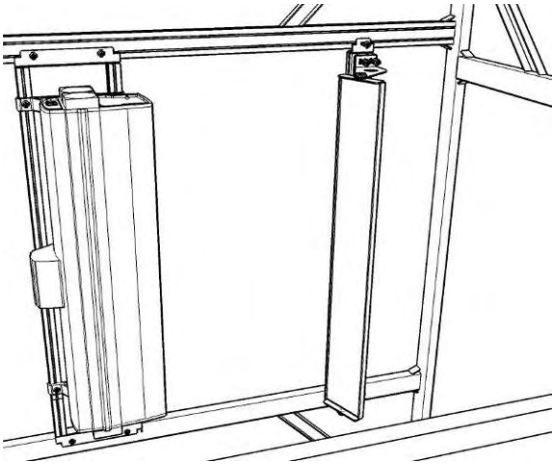


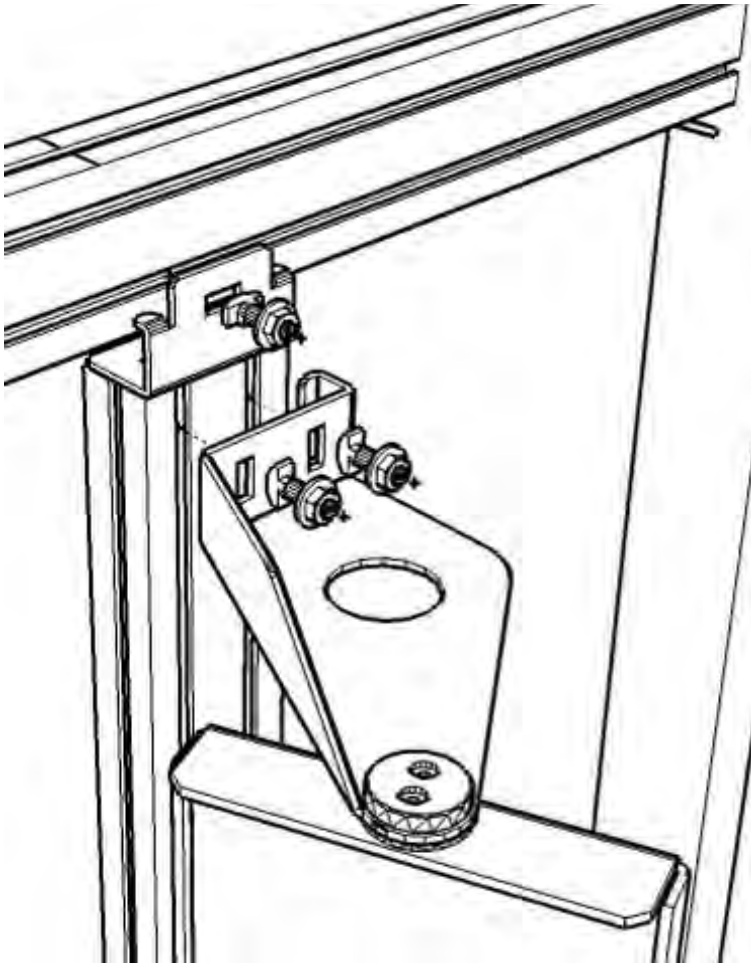
To install a mirror for a Side/Quadrant camera:

IMPORTANT: Depending on the application, the side-read camera may be installed on the inside of the mounting structure rather than the outside. Check your application structure drawings before mounting the side-read camera or mirror.

1. Place the mirror assembly onto the mirror sled in the position marked. *(Some mirror sleds are the same length as the mirror assembly, in which case there will be no marks.)*
2. Attach with front-loading hardware. Assure the mirror will not slide in the sled's channel when moved into position on the structure. Do not over-tighten, which allows for adjustment during setup, if necessary.
3. Assure mirror is positioned facing in the correct direction.
4. Insert the tabs of the sled's upper bracket into the structure channel, and then slowly rest the lower bracket into position.
5. Attach with front-loading hardware, beginning with the sled's upper bracket. Do not over-tighten.

IMPORTANT: Do not remove the protective film from the mirror's surface until system setup and calibration. *(See Chapter 5.)*

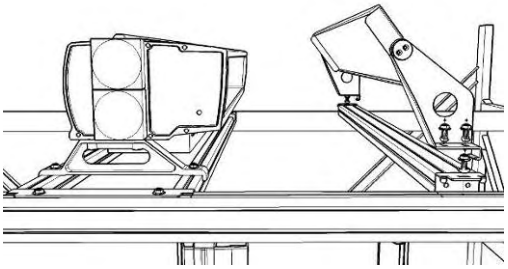


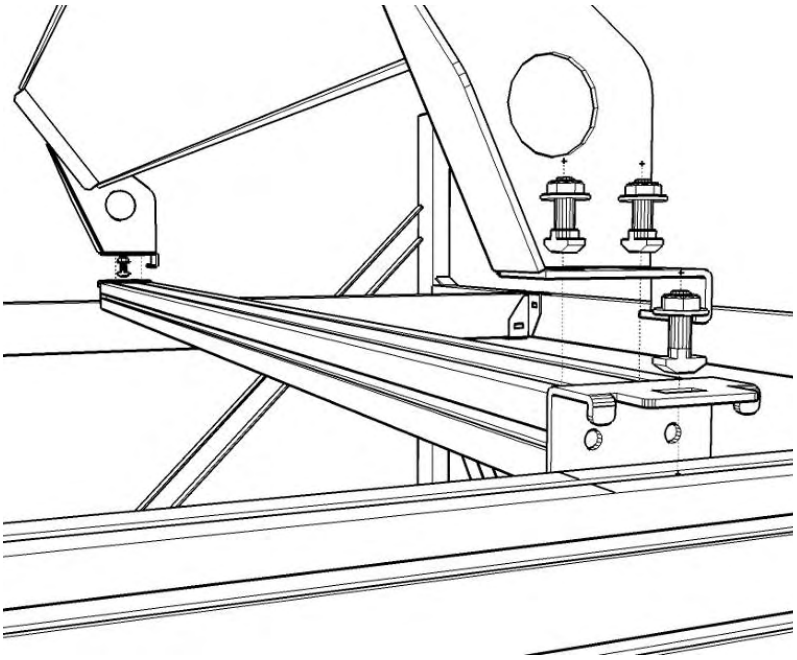


To install a mirror for a Bottom read camera:

1. Place the mirror assembly onto the mirror sled in the position marked. *(Some mirror sleds are the same length as the mirror assembly, in which case there will be no marks.)*
2. Attach with front-loading hardware. Assure the mirror will not slide in the sled's channel when moved into position on the structure. Do not over-tighten, which allows for adjustment during setup, if necessary.
3. Assure mirror is positioned facing in the correct direction and at the correct angle to the break in the conveyor belt.
4. Lift mirror into position as marked on the bottom-read mounting structure.
5. Attach with front-loading hardware (do not over-tighten).

IMPORTANT: Do not remove the protective film from the mirror's surface until system setup and calibration. *(See Chapter 5.)*





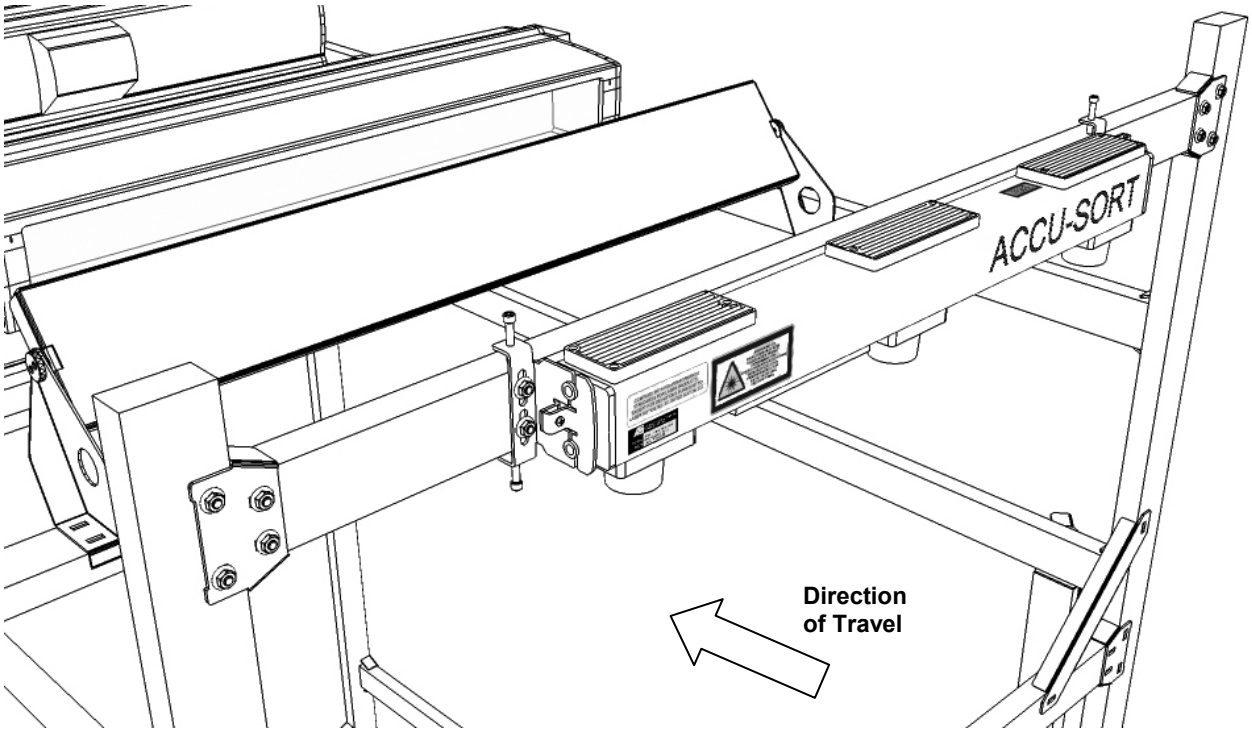
RangeFinder Installation

Prerequisites: None.

Tools Required:

- Socket driver (1/2”)
- Allen wrench (5/32”)

1. Attach mounting brackets to both sides of RangeFinder (if not already installed).
2. Assure RangeFinder is positioned facing in the correct direction.
3. Lift RangeFinder into position as marked on the mounting structure.
4. Attach with front-loading hardware (do not over-tighten).
5. Tie-wrap the power supply to the structure, making sure the power cable can be connected.
6. For RangeFinders used in applications with conveyors under 40-inches [1016 mm] wide, follow the procedure outlined in Chapter 5.

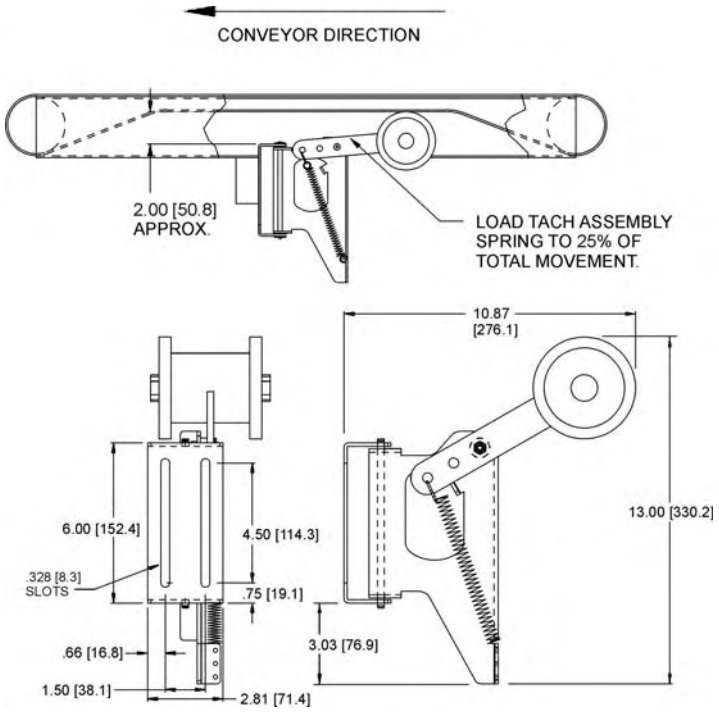


NOTE: Additional procedures related to RangeFinder installation are provided in ***Chapter 5*** including RangeFinder leveling and blocking codewords for narrow belts.

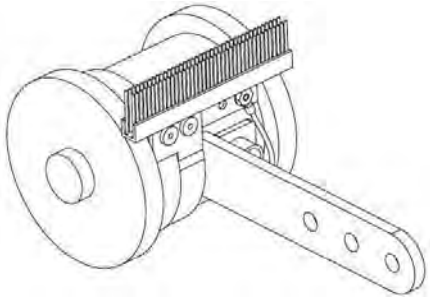
Mounting the Tachometer

The tachometer (tach) option outputs a set number of pulses for each wheel rotation. This tells the AV6010 the precise conveyor speed, allowing it to determine the exact package position. Tracking allows for multiple boxes to be in the scanning area at the same time. Bar codes on each box are decoded and assigned to the correct box. Follow the guidelines below:

- Mount the anti-static brush to the tachometer as shown in the drawing provided with the tach. The anti-static brush provided with the tach must be installed to assure proper operation.
- Mount the tach on the conveyor section where scanning is performed.
- Mount the tach on the underside of the conveyor, away from areas where the conveyor bows downward. A good place to mount the tach is on one end of the conveyor, underneath the drive shaft.
- Make sure the tach assembly angles in the same direction that the underside of the conveyor travels.
- The tach must make good contact with the conveyor.
- Use the general mounting kit provided with your system to make tachometer mounting and setup easier.



Tachometer Mounting *(anti-static brush not shown)*



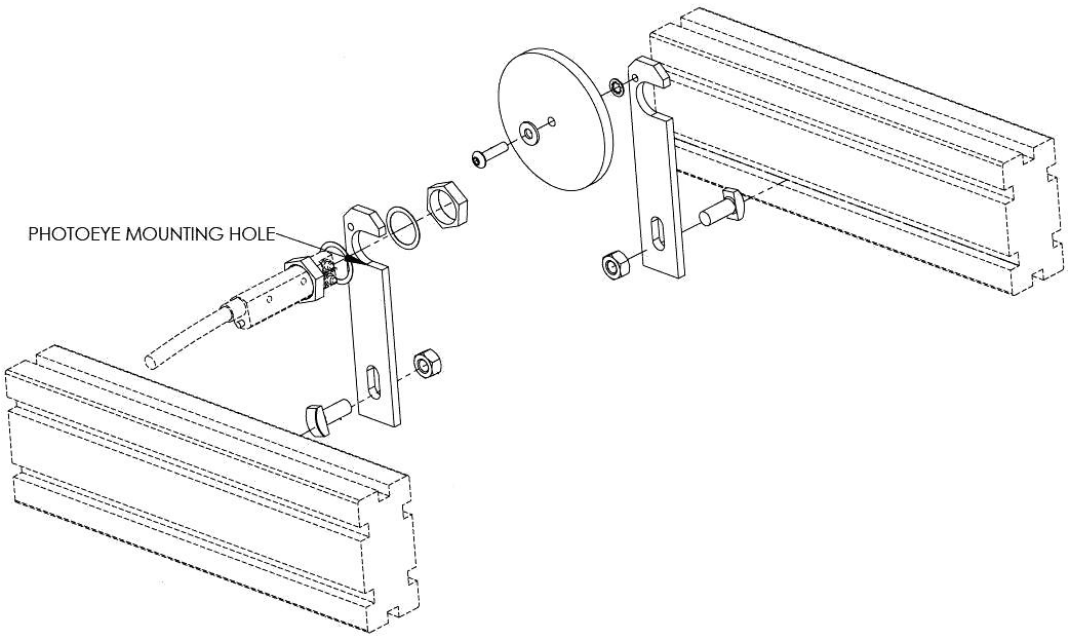
Tachometer with Anti-Static Brush Installed

Mounting the Trigger Photoeye

The standard photoeye works by bouncing a light beam off a reflector and detecting when something breaks the path of light. In order for photoeyes to work properly, make sure the following things are done when mounting the trigger photoeye option:

- Mount trigger and reflector so the reader's scan beam does not strike either of them.
- Mount a reflector directly opposite the photoeye on the other side of the conveyor.
- Install the reflector within the operating range of the trigger photoeye.
- The photoeye must be mounted so the light exit window is perpendicular to the conveyor, facing the reflector.
- The reflector must be mounted perpendicular to the conveyor, facing the photoeye.
- Secure the photoeye and reflector to the mounting brackets with the hardware provided.

IMPORTANT: The trigger photoeye's beam (between photoeye and reflector) must be blocked by a package before the bar code is in position for scanning. The trigger signal should remain active while the symbol is being scanned. This does NOT apply to tracking applications.



Mounting the Light Curtain

For installations that use the light curtain option, see the application-specific drawing for mounting details. See also the documentation provided with the light curtain. *See wiring information in Chapter 4.*

Mounting the Photoeye/Tach Generator Box

For installations that use the Photoeye/Tach Generator Box option (e.g., tilt-tray applications), see the application-specific drawing for mounting details. See also the documentation provided with the Photoeye/Tach Generator Box. *See wiring information in Chapter 4.*

Mounting the Uninterruptable Power Supply (UPS)

For installations that use the UPS option (e.g., for applications that experience frequent 'brown-outs'), see the application-specific drawing for mounting details. The mounting structure includes a bracket that supports the UPS. See also the documentation provided with the UPS. *See wiring information in Chapter 4.*

4 Electrical Installation

WARNING: Electrical installation by qualified service technicians only! A trained technician must perform any procedures involving potential exposure to high voltage electricity. Do not attempt to perform any electrical installation procedures unless you are a trained technician.

IMPORTANT: The AV6010 contains electronics that may be affected by electrostatic discharge (ESD). To prevent personal injury or damage to the unit, please follow the safety precautions and warnings found in *Chapter 2*. Failure to follow these precautions may void your warranty.

Preparing for Electrical Installation

Before performing any electrical installation, please do the following:

- Read all instructions before beginning your installation.
- Observe all electrical safety requirements. *(See Chapter 2.)*
- Complete mechanical installation. *(See Chapter 3.)*
- Review all installation-specific drawings.
- Compare any installation-specific information to the standard *Interconnection and Pinout* drawings in *Appendix I*. Note the differences (if any).
- Define and confirm the accuracy of your application's requirements.
- Plan the power requirements for your application.
- Define the communications requirements for your application.

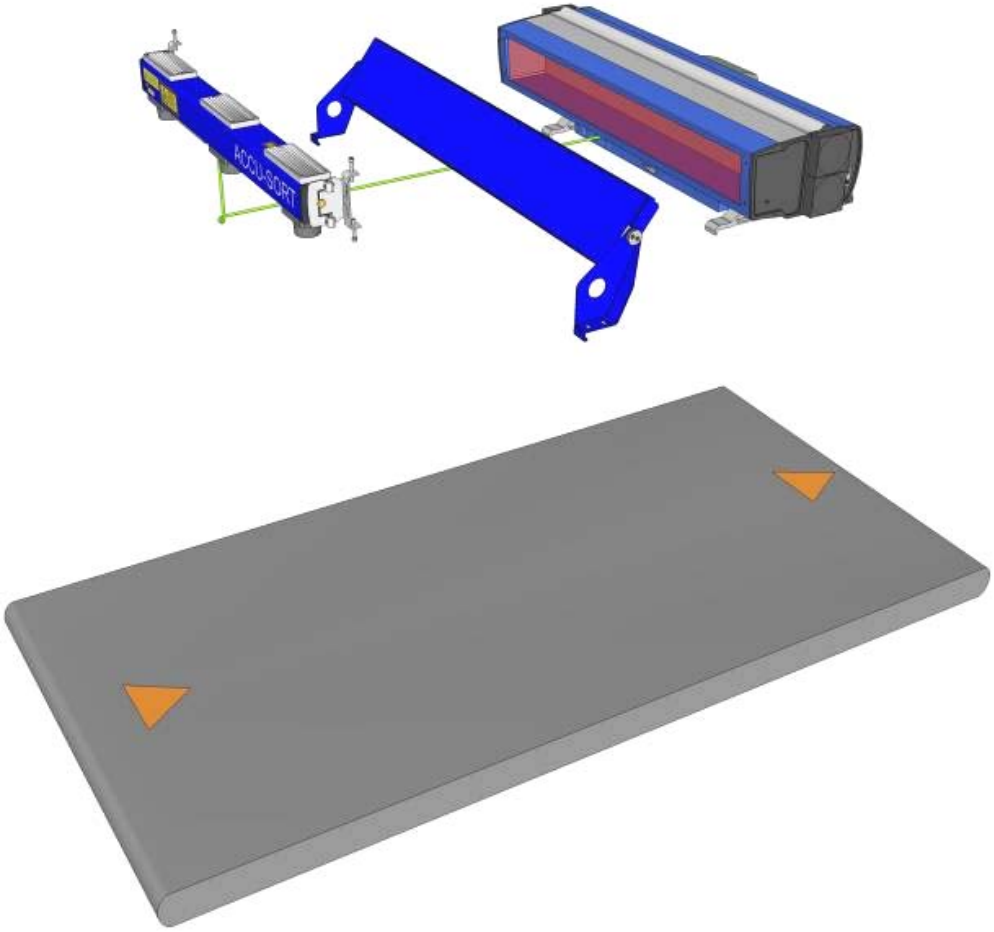
IMPORTANT: AV6010 cameras ship with all the necessary cabling required to electrically install the system. If your system requires custom-length cables or other special wiring, your shipment includes documentation specific to these requirements. Customer-specific documentation provided by Accu-Sort supersedes any contradictory content in this manual.

Before proceeding with any installation procedures, be sure to review ALL documentation, especially any containing details specific to your installation.

Installation Sequence(s)

NOTE: Everything should be **MECHANICALLY INSTALLED** before performing any **ELECTRICAL INSTALLATION**. See *Chapter 3* for mechanical installation details.

Installing a Single Camera System



Prerequisites:

- Complete preparations for electrical installation *(see page 47)*
- Cabling *(supplied with equipment)*
- Channel locks *(for holding cables inside structure channels) (supplied with structure)*
- Single-camera system interconnect drawing 112754 in Appendix I *(or installation-specific interconnect drawing, if provided)*

Tools Required:

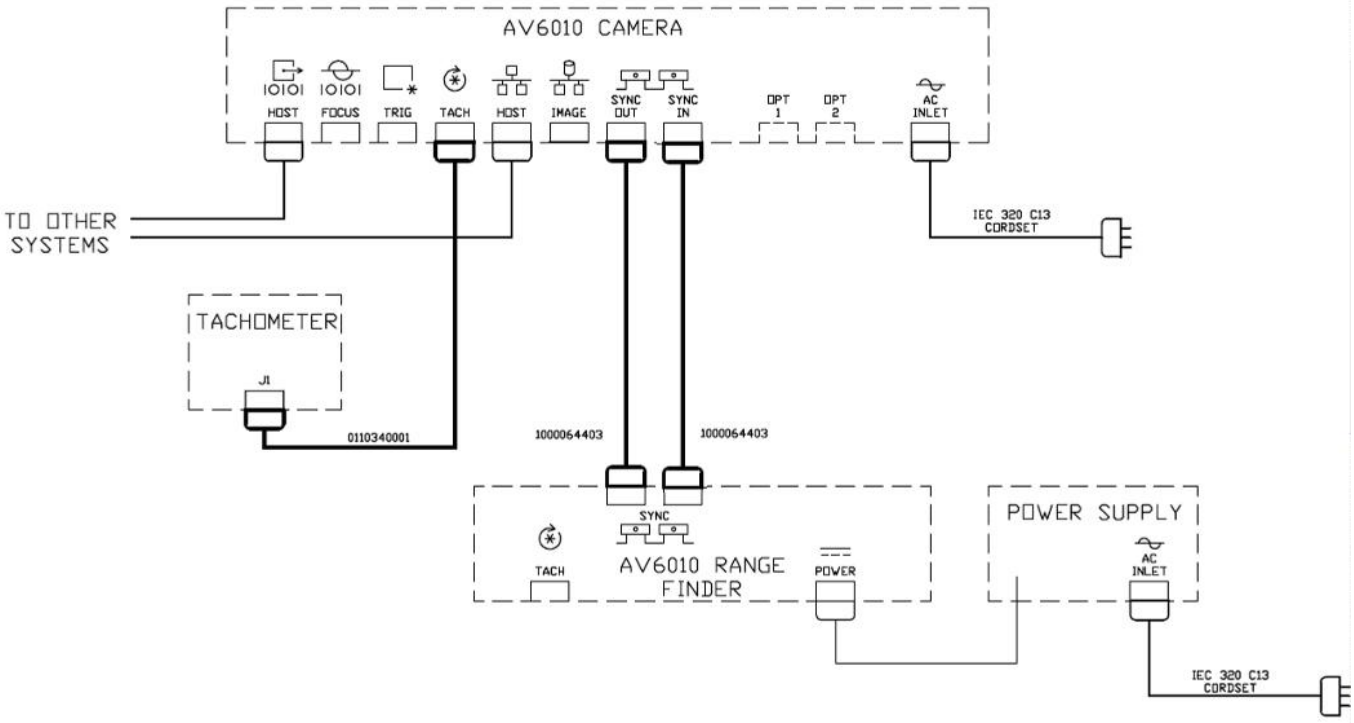
- None *(basic tools may be needed to make mechanical adjustments)*

To electrically install an AV6010 single camera system:

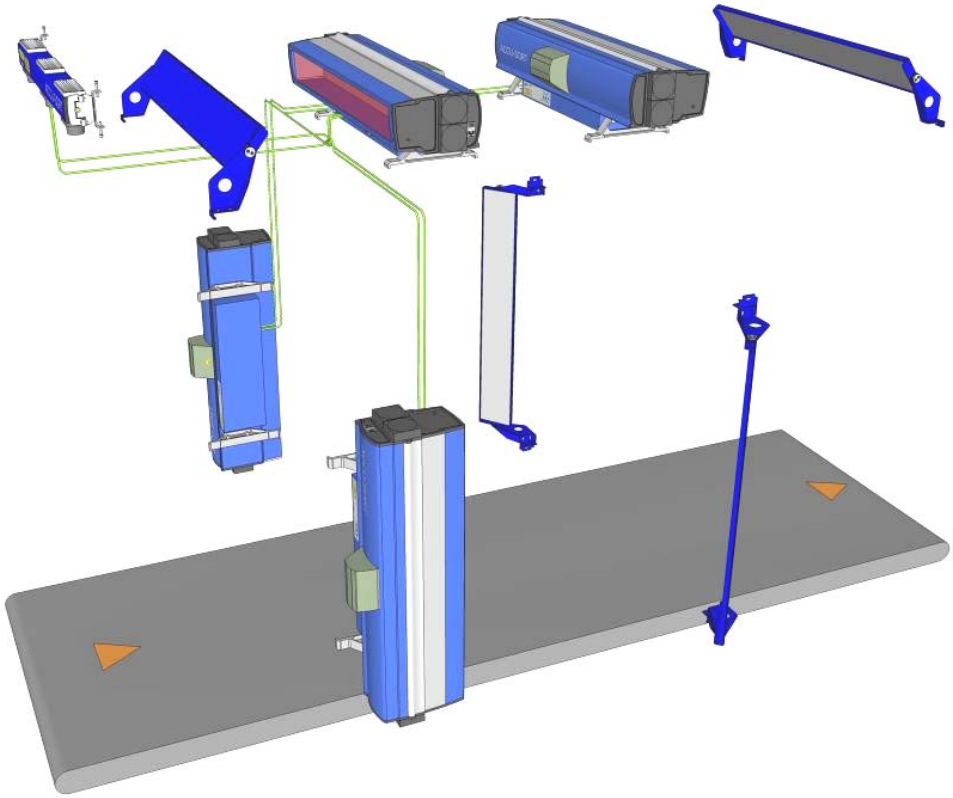
1. Ground the mounting structure to protective earth (PE) ground.
2. Connect RangeFinder to its power supply.
3. Connect the RangeFinder power supply to its power source.
4. Connect the AV6010 Camera to its power source.

5. Connect one of the RangeFinder's SYNC ports to the camera's SYNC IN.
6. Connect the other RangeFinder SYNC port to the camera's SYNC OUT.
7. Connect the tachometer to the camera's TACH port (if required). *(Do NOT connect the tachometer to the RangeFinder's TACH port.)*
8. Connect the photoeye to the TRIG port (if required).
9. Connect AV6010 HOST communications, as needed (e.g., HOST serial port or HOST Ethernet network).
10. Connect the VisionCapture / IDS Server's LAN connection to the camera's IMAGE port (if required).
11. Connect the optional FAST Monitor Server's LAN connection to the camera's HOST network port (if required).
12. Complete any additional connections shown on the installation-specific drawings *(if provided).*

NEXT STEP: Setup / check AV6010 operations. *(See Chapter 5.)*



Installing a Multiple Camera Tunnel



Prerequisites:

- Complete preparations for electrical installation *(see page 47)*
- Cabling *(supplied with equipment, may be color coded)*
- Channel locks *(for holding cables inside structure channels) (supplied with structure)*
- Multiple-camera system interconnect drawing 112753 in Appendix I *(or installation-specific interconnect drawing, if provided)*

Tools Required:

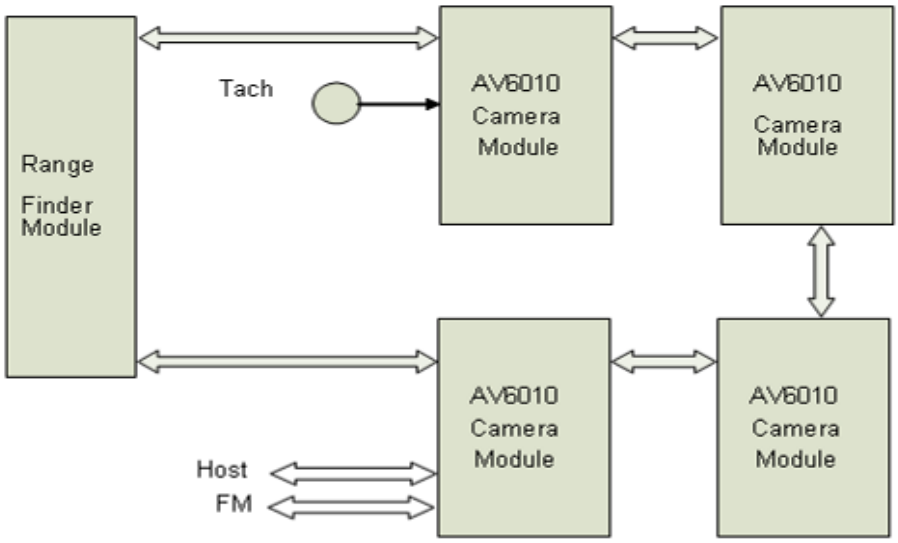
- Wire cutters / strippers
- Screwdriver
- *Basic tools may be needed to make mechanical adjustments.*

To electrically install an AV6010 multiple camera system:

1. Ground the mounting structure to protective earth (PE) ground.
2. Connect RangeFinder to its power supply.
3. Connect the tachometer to the Controller camera's TACH port (if required). *(Do NOT connect the tachometer to the RangeFinder's TACH port.)*

4. Connect the photoeye to the designated camera's TRIG port (if required).
5. **AC power:** Connect the RangeFinder, cameras and all other devices to the AC power source. Typically an Accu-Sort Power Distribution Box (PDB) is used. *(See page 55.)*
6. **SYNC network:** Determine which is the Controller camera and/or dimensioning camera. Connect the RangeFinder and all cameras completing a 'ring' network. *(See page 58.)*
7. **IMAGE network**: Connect the camera's IMAGE ports to the VIsionCapture / IDS Server's network switch (if required). *(See page 59.)*
8. Connect the optional FAST Monitor Server's LAN connection to the camera's HOST network port (if required). *(See page 59.)*
9. Connect AV6010 HOST communications, as needed (e.g., HOST serial port or HOST Ethernet network).
10. Complete any additional connections shown on the installation-specific drawings *(if provided).*

NEXT STEP: Setup / check AV6010 operations. *(See Chapter 5.)*



General Electrical Installation Guidelines and Precautions

It is important that you follow these general precautions when installing, setting up, operating, maintaining, troubleshooting or replacing any Accu-Sort products, parts or related equipment.

As you plan and install your AV6010, be sure to keep the following guidelines in mind:

- Determine the AV6010 is in the proper location as outlined in Chapter 3.
- Leave adequate clearances (approximately 8-12 inches [203-305mm]) for wiring.
- Route wires carefully to reduce or minimize electrical noise.
- When power and communication wiring must cross, make their intersection perpendicular. Avoid running power and data wiring parallel to each other. If possible, maintain one of the following separations between the power and data wiring:
  - 12 inch [300 mm] gap
  - use steel conduit and 1 inch [25 mm] gap
  - 0.25 inch [6.5 mm] of aluminum.

IMPORTANT: When planning your installation wiring, remember all power connections must be quick-disconnect. For PERMANENTLY CONNECTED EQUIPMENT a readily accessible disconnect device must be incorporated in the building installation wiring. For PLUGGABLE EQUIPMENT the socket-outlet must be installed near the equipment and must be easily accessible.

The IEC power connectors of the AV6010 cameras and RangeFinder provide the necessary quick-disconnect.

WARNING: To assure no ESD damage will occur, be sure to observe the precautions outlined in *Chapter 2, Safety*.

IMPORTANT: Ground the mounting structure to safety ground (protective earth ground (PE)). See wiring recommendations for safety ground.

Wiring the AV6010

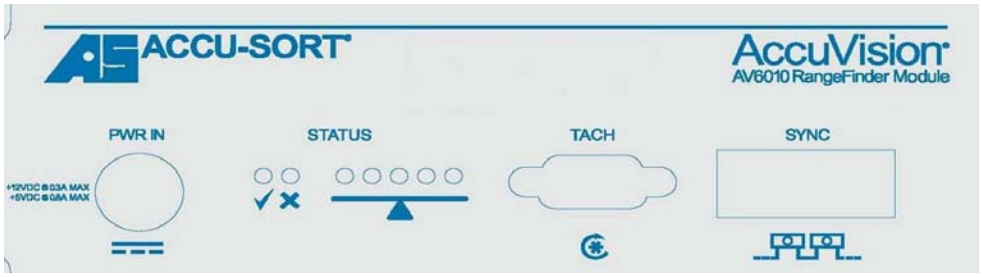
After completing mechanical installation, use this section to properly wire your AV6010 for optimal performance in your application. All wiring connections to the AV6010 are made to the connector panel.

Determine the wiring connections needed for your application. All connections are made to the AV6010 interface/connector panel using the cables shipped with your equipment.

Drawing	Description
112754	AV6010 Single Camera Interconnections
111515	AV6010 Connector Pin-outs
Multiple Camera Systems	
112753	AV6010 Multiple Camera System Interconnections
111062	Power Distribution Box Wiring Diagram (standard)
111912	Power Distribution Box with Disconnect Wiring Diagram (larger box)

NOTE: See the standard drawings provided in Appendix I. Application-specific drawings supersedes those listed here.

AV6010 Camera – Interface / Connector Panel



AV6010 RangeFinder – Interface / Connector Panel

The cables are color coded:

- SYNC cables are BLUE.
- IMAGE cables are YELLOW (for optional image capture system).

Avoiding Electromagnetic Interference Using Ferrites and Shielding

To avoid electromagnetic interference, snap-on ferrites or shielded cable should be used as described below.

Connection Type	
HOST (SERIAL)	Use 2 snap-on ferrites positioned on the serial host cable as shown on Ethernet cables below
FOCUS (SERIAL)	Use 2 snap-on ferrites positioned on the serial focus cable as shown on Ethernet cables below
HOST (NET)	Shielded cable or 2 snap-on ferrites placed as shown below
IMAGE (NET)	Shielded cable or 2 snap-on ferrites placed as shown below
SYNC (NET)	Shielded cable

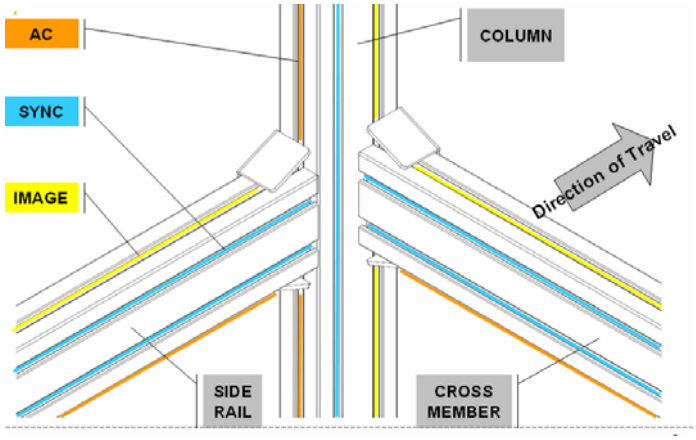
Placement of Snap-On Ferrites on Cables

To Attach the Ferrites:

Snap two ferrites to each Ethernet or serial cable like those shown in the image on page 1. Place the ferrites approximately the distance shown from the end of the cable (close to the AV6010).

Wiring Routing

Route wiring to the AV6010's connector panel through the wiring channels on the Accu-Sort mounting structure.



Wiring Channels on Mounting Structure

Power Requirements

IMPORTANT: When planning your installation wiring, remember all power connections must be quick-disconnect.

See the *Power Consumption Estimates* table in *Appendix A* to determine the needs for your installation. The table provides details for single-camera and multiple-camera applications.

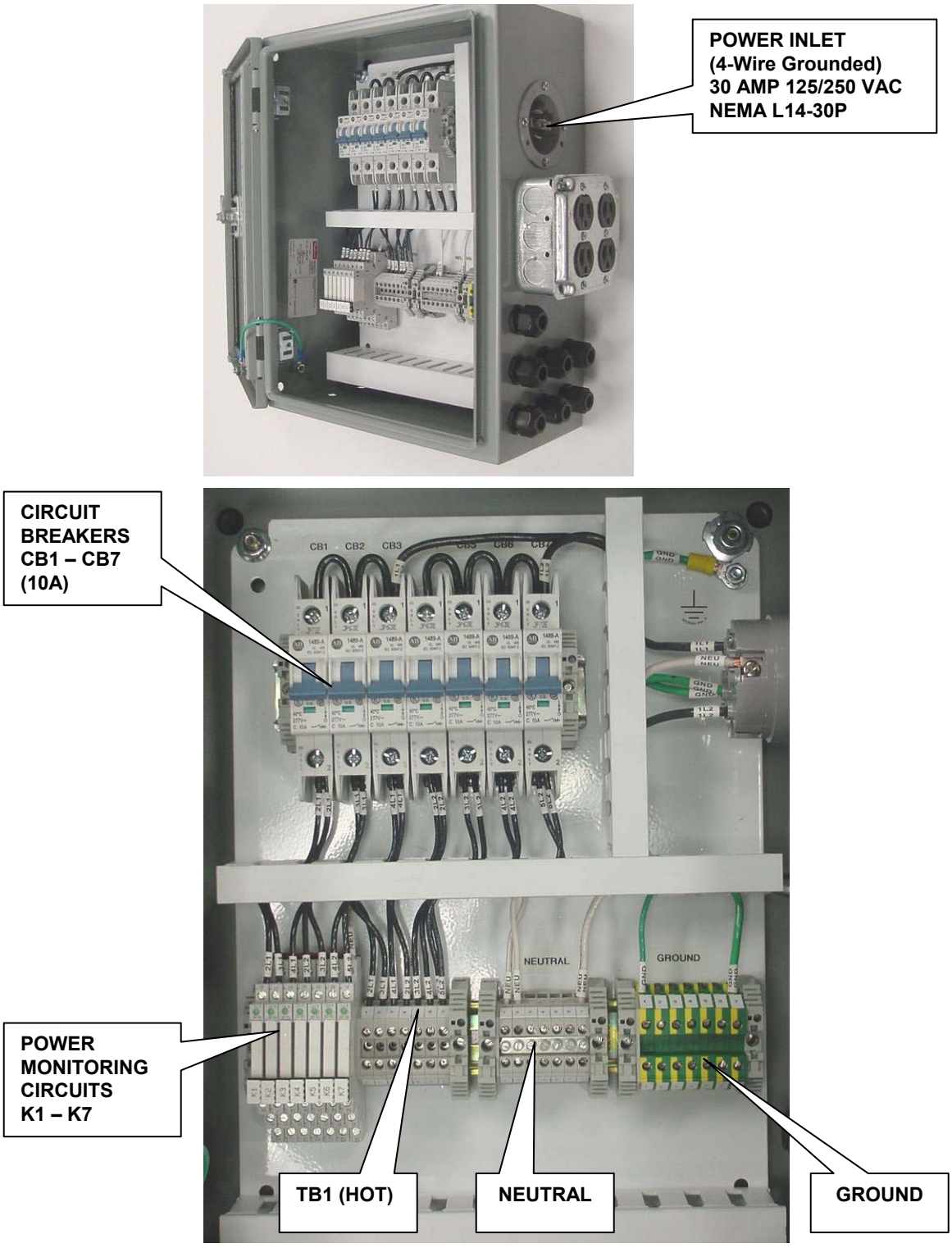
Power Supply Connections

CAUTION: While performing the following wiring connection procedures, be sure to follow all safety procedures regarding high-voltage as outlined in *Chapter 2, Safety*. No power should be applied to any device until all wiring is completed and checked for accuracy.

REMEMBER: The socket-outlet must be installed near the AV6010's power supply. The outlet must be a readily accessible disconnect device. The IEC connector of the AV6010's power supply provides the necessary quick-disconnect.

Power Distribution Box for Multi-Camera Systems

Applications using two or more cameras will use the Power Distribution Box (PDB, 111063) to handle power for the RangeFinder, up to six cameras and the optional VisionCapture/Image Depot Server (IDS).

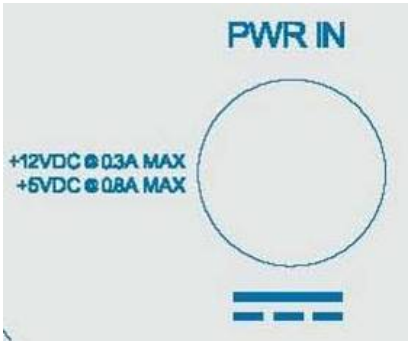


Power Distribution Box Connections

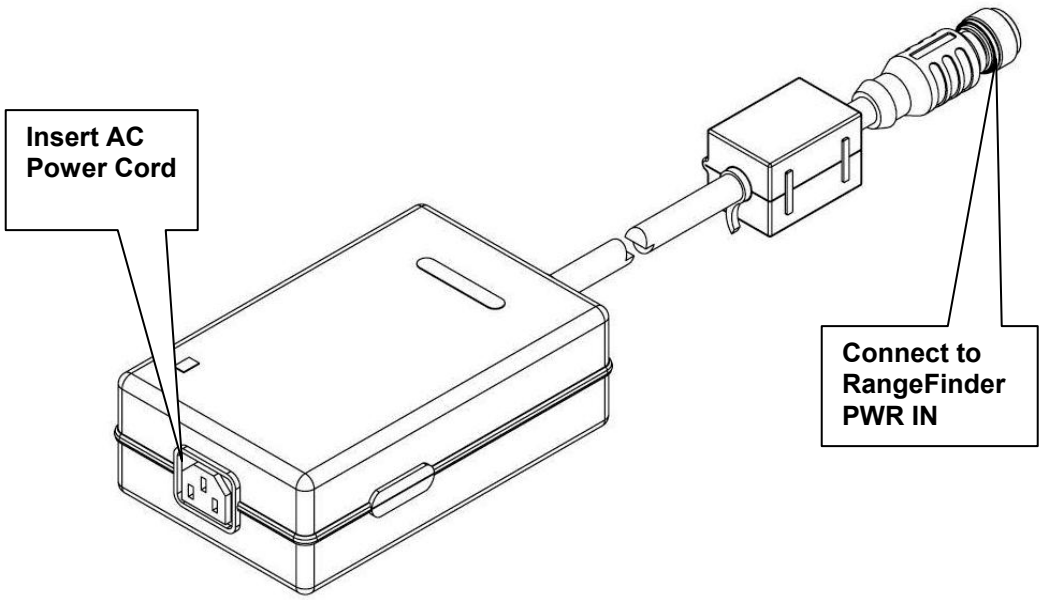
RangeFinder Power Supply Connection

RangeFinder power supply connection procedure:

1. Connect the power supply DC input connector into the RangeFinder's PWR IN (DC input).
2. Plug the AC power cord into the power supply.
3. Plug the AC power cord into the power source.
4. ***For multi-camera systems:*** If a Power Distribution Box (PDB) is used, it can be plugged into the outlet box on the right side of the PDB.



RangeFinder PWR IN

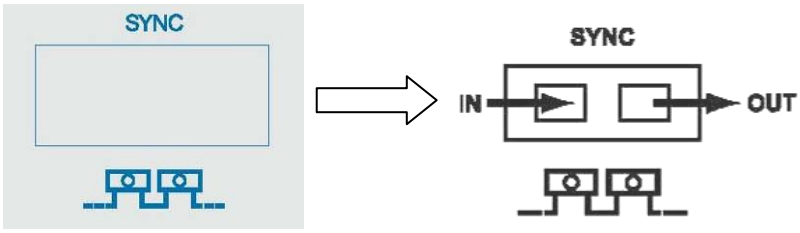


AV6010 SYNC Network

The AV6010 Camera System uses Ethernet communications for a dedicated SYNC network. Only AV6010 cameras and the RangeFinder may be connected to the SYNC network. See the interconnect drawings for a single-camera (112754) and multi-camera system (112753) in *Appendix I.*

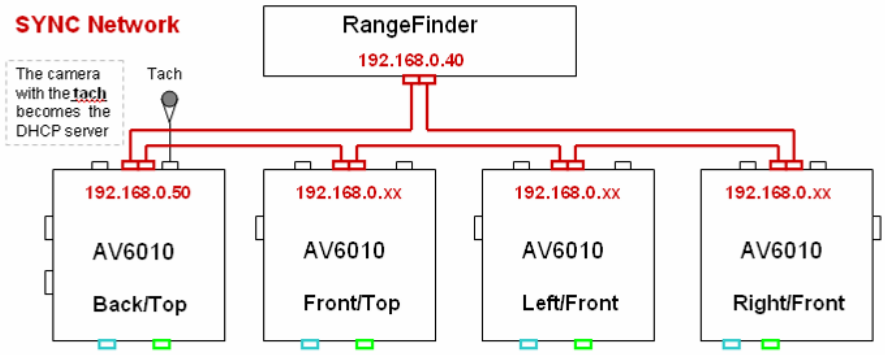
Connecting RangeFinder to Camera:

1. Connect the BLUE network cable to one of the SYNC ports on the AV6010 RangeFinder.
2. Insert the cable into the wiring channels of the mounting structure. *(See illustration on page 54.)*
3. Connect the other end of the network cable to the AV6010 Camera's SYNC IN port.
4. Connect a second network cable from the camera's SYNC OUT port to the 'open' SYNC connection on the RangeFinder.



AV6010 RangeFinder ***AV6010 Camera***

Camera to RangeFinder Connection



NOTE: In applications where there are two or more cameras, the SYNC OUT from the last camera should be connected to the 'open' SYNC connection on the RangeFinder. (See *Connecting Camera to Camera*.)

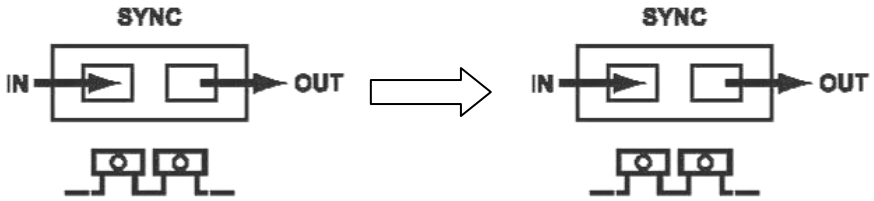
Connecting Camera to Camera:

In applications where there are two or more cameras, the SYNC network forms a 'ring network' that starts and ends with the RangeFinder. *(See drawing 112753 in Appendix I.)*

Connections between cameras should be made as follows:

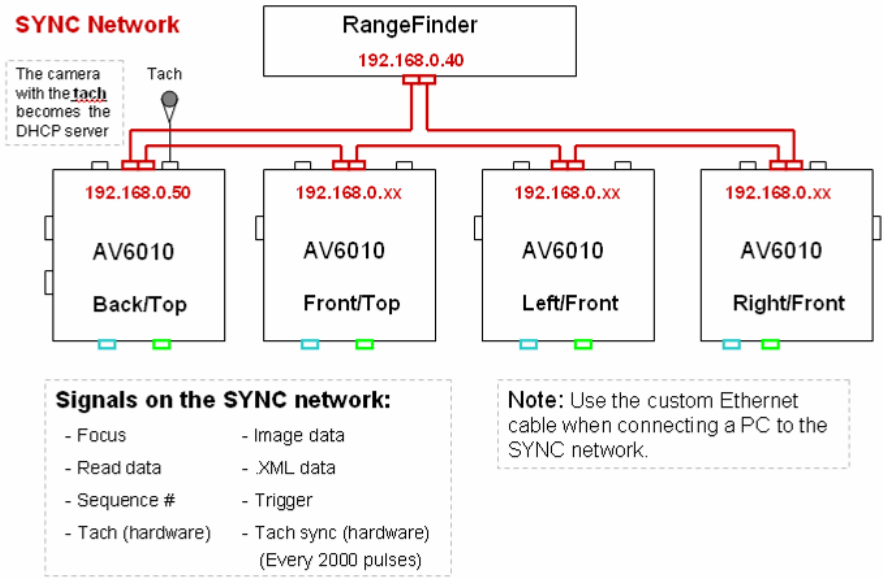
1. Connect from the SYNC OUT of Camera 1 to the SYNC IN of Camera 2.
2. Insert the cable into the wiring channels of the mounting structure. *(See illustration on page 54.)*
3. Continue making the camera network connections for all cameras in the tunnel. The SYNC OUT from the last camera should be connected to the 'open' SYNC connection on the RangeFinder.

IMPORTANT: The two most important cameras in a multi-camera system should be connected to the RangeFinder. For example: Both the camera acting as the DHCP server (i.e., that is most accessible, handles the tach connection to the system and/or will be reading the highest percentage of codes) and the top read / dimensioning camera should be connected to the RangeFinder. In some application, these functions are all handled by the same camera.



AV6010 Camera 1 *AV6010 Camera 2*

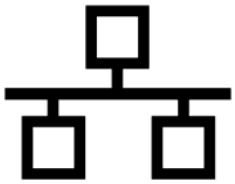
Camera to Camera Connection



Ethernet Communications Connections

The AV6010 uses Ethernet for LAN (local area network) communications. Ethernet communications cabling can be run up to 330 feet [100 meters].

See interconnection drawings 112753 and 112754 in Appendix I.



HOST Network

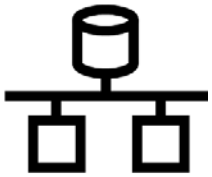
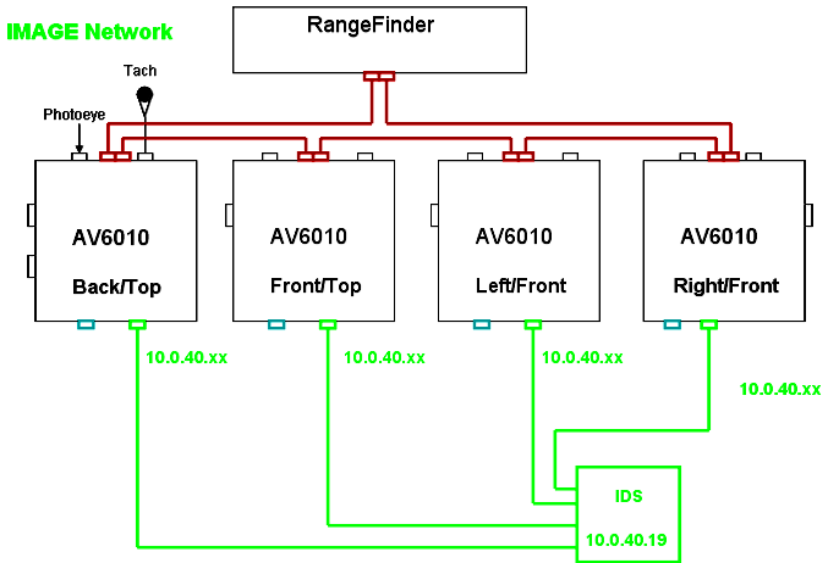


IMAGE Network

Connecting a Host or Image Network:

1. Connect one end of the cable to the HOST or IMAGE network connection on a camera.
2. Insert the cable into the wiring channels of the camera sled and mounting structure. *(See illustration on page 54.)*
3. Connect the cable's other end to the HOST or IMAGE network device.
4. Continue making the network connections from each camera in the system to the HOST or IMAGE network device until all the devices are connected as required by the application.

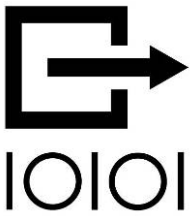


See drawing 112753 in Appendix I:

- Sheet 3 for the multi-camera **IMAGE network** connections
- Sheet 4 for the multi-camera **FAST Monitor** network connections

RS232/422 Serial Communications Connections

The AV6010 provides two standard RS232/422 serial ports identified as **HOST** and **FOCUS.** Use RS232 for a direct connection to a controller, personal computer, or other device.



HOST (Serial Port)

FOCUS (Serial Port)

- RS232 provides point-to-point communications at distances up to 50 feet [15.2 meters].
- RS422 provides point-to-point communications at distances up to 1000 feet [300 meters]. RS422 communications require the use of an RS232-to-RS422 converter.

NOTE: *See the serial port pin-outs drawing 111515 in Appendix I.* Your application interconnections may vary from those defined here. Be sure to review any application-specific information provided with your equipment.

In **AV6010 dimensioning applications**, the 2-line by 20-character remote display option is connected to the FOCUS port of the top-read (dimensioning-enabled) camera.

TACHOMETER and TRIGGER Connections

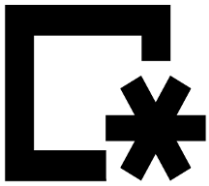
If your system includes the TACH or TRIG options, be sure to use the provided cables to make the necessary connections.

In multi-camera networks, these connections are made to only one camera. That camera is considered to be the 'controller' (also called the DHCP server).

Applications using a tachometer (TACH) should have the provided ferrite installed on the cable to help eliminate 'noise'.

In applications with a bottom read camera, the trigger (TRIG) may be connected it.

TACH



TRIG

NOTE: In systems that involve application-specific requirements, it is possible that light curtains and / or an Accu-Sort Photoeye/Tach Generator may be used instead of the standard devices. See any application-specific drawing(s) for details on installing and wiring these devices.

In-camera Dimensioning Connections

If your system includes the in-camera dimensioning option, the 2-line by 20-character remote display option is connected to the FOCUS port of the top-read (dimensioning-enabled) camera. *(See also Appendix G.)*

Raw Image Export (RIE) Connections

If your system includes the raw image export option, the destination device that will be receiving the raw images from the camera needs to be connected to the RIE output of the RIE-enabled camera(s). *(See also Appendix H.)*

Check AV6010 Installation

After completing the installation of your AV6010:

- Confirm that the AV6010 has been properly installed mechanically and electrically. Use the *Installation Sequence* at the beginning of this chapter and your application specifications to check your installation.
- All interconnections should match the drawing that is applicable to your system's application. *(These drawings are superseded by any customer-specific documentation provided by Accu-Sort.)*
- The AV6010 is pre-configured for your application at the factory. If necessary, you can change the configuration of the AV6010's parameters to meet the needs of your application. *(See Chapter 5 for details.)*
- An ***initial startup checklist*** and ***operations checklist*** is provided in Chapter 5.

5 Setup

This chapter provides details on how set up the AV6010 Long-Range Camera System for your application. It outlines how to:

- Auto calibrate the system to your application
- Define the symbologies your system will decode
- Configure the communications between the system and host

After configuring your system using the browser-based **AV6010 User Interface** and **AV6010 Install Wizard,** use the operations checklist in *Chapter 6* to verify normal operations.

Prerequisites:

- Complete the camera system installation for your application requirements. *(See Chapters 3 and 4.)*
- Know your application specifications (e.g., symbologies, communications, etc.).
- Assure your computer meets the system requirements and the required privileges for changing the IP address of your computer.

Tools Required:

- Flathead Screwdriver
- Allen Wrench (5/32”)
- Socket Driver (1/2”)
- AV6010 Setup & Calibration Kit (10000456001)

Setup System Requirements

The laptop computer you use to setup the AV6010 Camera System should meet the following requirements:

Category	Description
Basic Configuration for using Install Wizard	Windows XP Operating System Ethernet port/NIC Card Microsoft .NET framework *(see page 94)*
Internet Browser for using AV6010 Interface	Microsoft® Internet Explorer 6.0 or later Mozilla Firefox 2.0 or later
Screen Resolution (Optimal)	1024 x 768

To gain access to an AV6010 Camera:

1. Because AV6010 is web-based, you will need to obtain the correct IP address, netmask and gateway that will be used within the building from the system administrator. This will be used to establish a HOST network later.
2. For the initial AV6010 setup, you will connect via the SYNC network.
   (Use the special SYNC network adapter cable that is included with the AV6010 Setup & Calibration Kit.)
3. Using Internet Explorer or Mozilla Firefox, open a browser window.
4. Enter the camera's IP address in the **Address** entry field.
5. Save the IP address as a Favorite or Bookmark in your browser for quick and easy access.
6. After first time setup, you may need to obtain the password from the system administrator.
7. When a connection is established, the AV6010 User Interface should appear.

For details, see page 74.

IMPORTANT: After an Accu-Sort trained and authorized technician configures your AV6010 camera system, they will verify normal operations and make calibration adjustments as necessary. The information in this chapter is for reference purposes only.

For further information on training, contact us at 1-800-BAR-CODE.

First-Time Setup Checklist

Basic Setup

☐ 1. Confirm that all equipment is mechanically and electrically installed properly. *(See Chapters 3 and 4.)*

☐ 2. Unlock camera head and align the mirror.
(In multi-camera tunnels, confirm the power switch is ON.)

☐ 3. Level RangeFinder and block codewords if the application is using a narrow belt (under 40-inches).

☐ 4. Follow the first-time startup procedure.

☐ 5. Establish a connection and login to the system.

☐ 6. System Configuration
Assign system name and positions of each camera in the system.

☐ 7. Tach Configuration
Confirm that the tachometer settings are correct.

☐ 8. Focus and Package Info
Specify how the system is configured.

☐ 9. Mounting (RangeFinder and Camera(s))
For first-time setup, use the **AV6010 Install Wizard** to auto calibrate the system. Use these windows to make adjustments as necessary.

☐ 10. Serial Port Setup

☐ 11. Networking Setup

- ☐ Image network (VisionCapture/IDS, optional)
- ☐ Host network

☐ 12. Symbologies and Messages

☐ 13. Special Tools (Diagnostics > Tools) *(Chapter 8)*

- ☐ Download Install Wizard (for system calibration)
- ☐ Set password

System Calibration

☐ 14. Install Wizard > RangeFinder Wizard

☐ 15. Install Wizard > Camera Wizards
Based on the application, this may involve performing the Static Focus Calibration for up to six cameras positioned in a scanning array or tunnel.

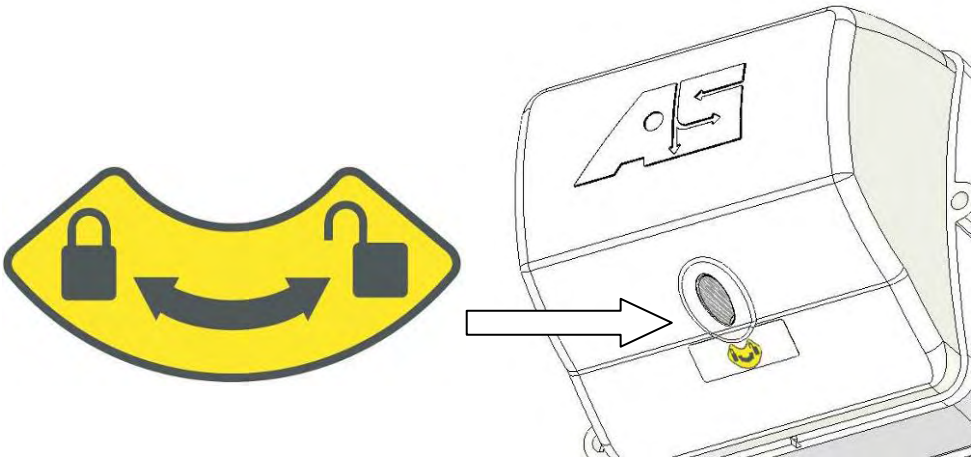
☐ 16. Dynamic Focus Calibration of all cameras using Image Viewer

☐ 17. Dimensioning Calibration *(option)*

☐ 18. Side-by-Side Package Detection Calibration *(option)*

Unlock the AV6010 Camera Head

1. Locate the shipping screw on the camera.
2. Using a flat head screwdriver, turn the camera head shipping lock to the unlocked position. Only turn 1/4 turn counter-clockwise. Do not force the shipping screw beyond the 1/4 turn. You will feel it ‘click’ into position.
3. For multi-camera tunnels, also confirm the power switch is in the ON position for every camera in the system.



Close-Up of Shipping Lock Location

Location of Camera Head Shipping Lock

Mirror Alignment

Before using any of the camera calibration wizards, you will need to:

- Install the folding mirrors
- Determine proper mirror angles
- Confirm proper mirror alignment for the camera position.
- Remove the protective film from the mirror surface.

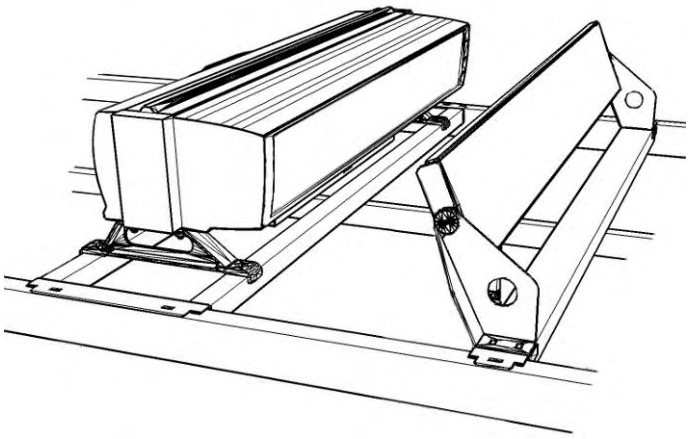
Prerequisites: Before you begin, you will need:

- Mirror alignment tools (8, 15, and 45-degrees)
- 5/32” Allen Wrench

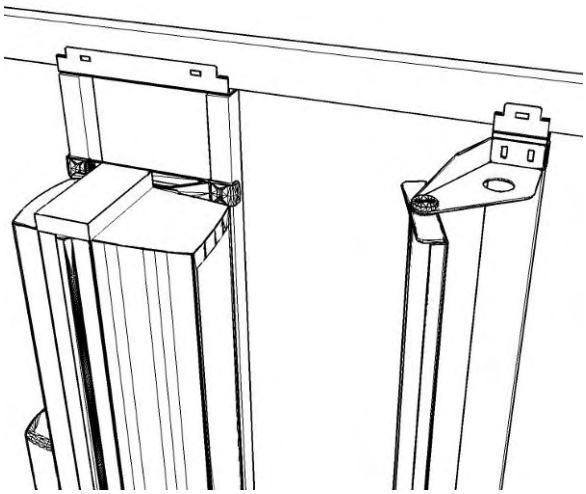
The standard mirror angles are as follows:

Camera Position	Mirror Orientation (standards)
Front / Back	45-degrees
Top Read	15-degrees *
Side Read	15-degrees *
Bottom Read	15-degrees *
Quadrant	45-degrees

*** NOTE:** In some applications the top read, side read and bottom read camera mirror may be set for 8-degrees.The mounting structure drawings provided with your application will identify which angle is to be used.



Front / Top / Back Read
Orientation of Mirror to Camera



Side Read / Quadrant
Orientation of Mirror to Camera

AV6010 Camera and Mirror Alignment

To align a mirror for Front, Top or Back applications:

1. Confirm mirror is properly mounted to the mirror sled *(as shown)*. The flanged edge of the mirror mounting brackets should face the camera and the mirror angle will be almost parallel with the flange.

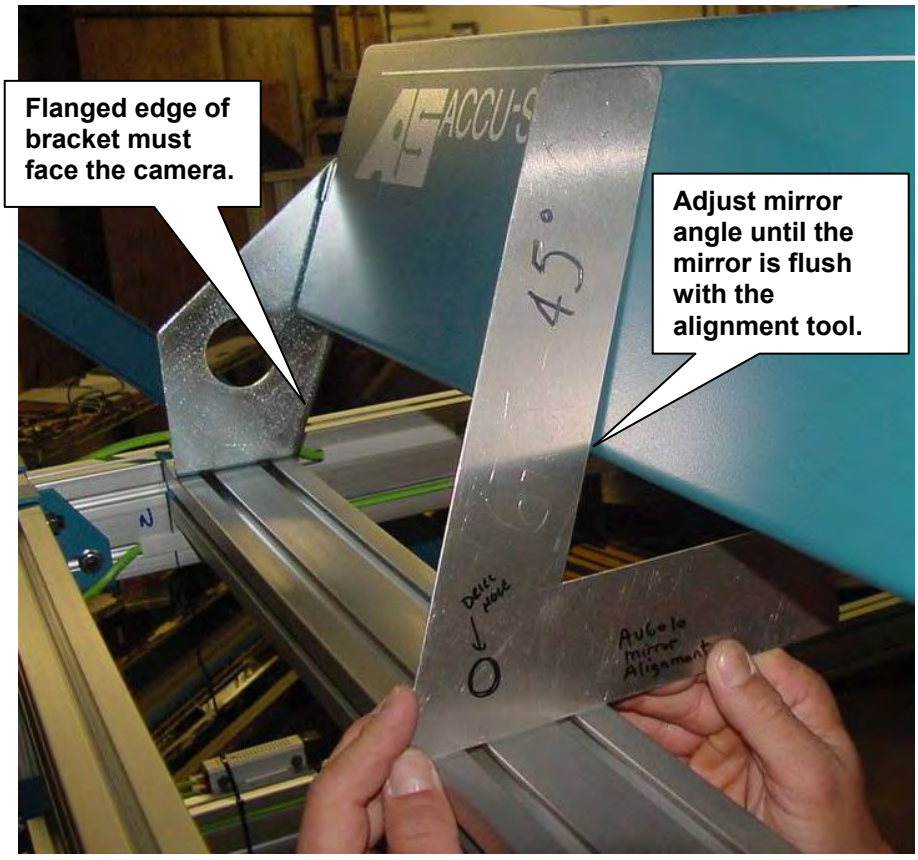
2. Confirm the mirror assembly is mounted in the correct position on the mounting structure. (Mirror positions are pre-marked on the mounting structure. You can also check these positions on any mounting structure drawings provided with your system.)

3. Use the proper mirror alignment tool to set the mirror position.

4. Tighten the mirror mounting screws that fix the mirror position in place.

5. After tightening the hardware, re-check the mirror angle with the alignment tool.

6. Remove the protective film from the mirror surface before attempting calibration.



Mirror Alignment for Front, Top and Back Cameras

IMPORTANT: Mirrors for front, top and back read applications must be aligned parallel with the flanged edge of the mounting bracket using the inside edge of the alignment tool. Mark the bracket and write down the angle in case the mirror ever needs to be replaced.

To align a mirror for Side Read applications:

1. Confirm mirror is properly mounted to the mirror sled *(as shown)*. The flanged edge of the mirror mounting brackets should face the camera and the mirror angle will be almost perpendicular with the flange.

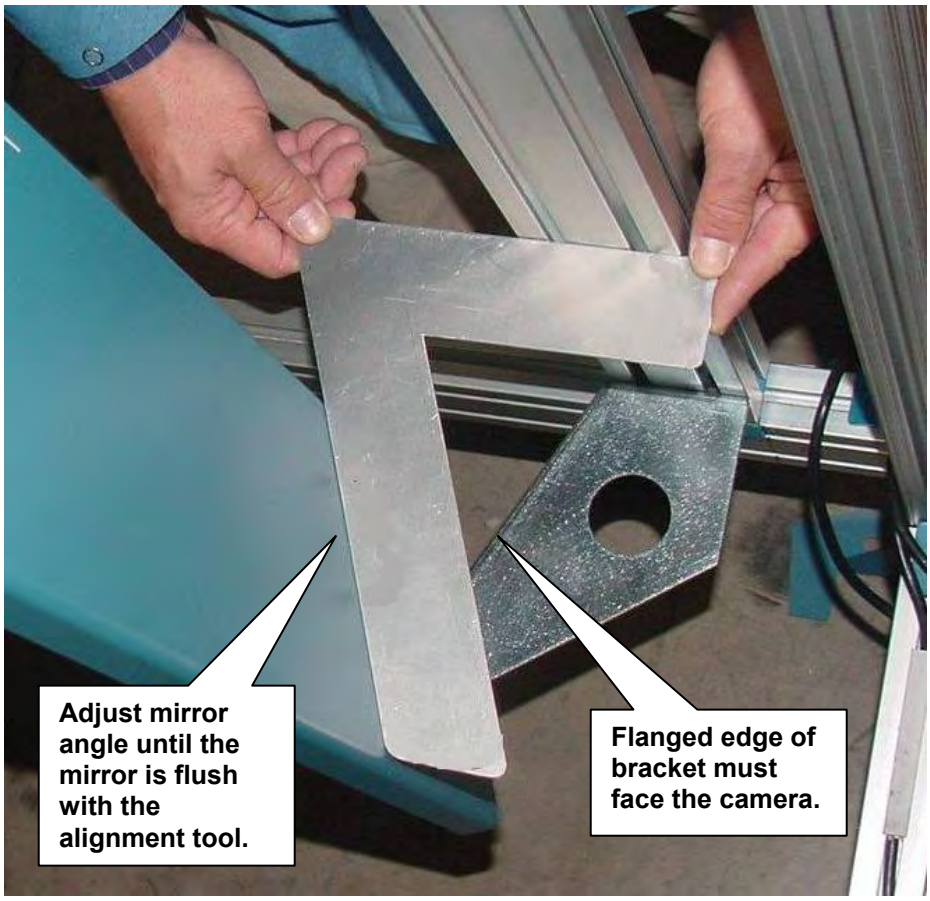
2. Confirm the mirror assembly is mounted in the correct position on the mounting structure. (Mirror positions are pre-marked on the mounting structure. You can also check these positions on any mounting structure drawings provided with your system.)

3. Use the proper mirror alignment tool to set the mirror position.

4. Tighten the mirror mounting screws that fix the mirror position in place.

5. After tightening the hardware, re-check the mirror angle with the alignment tool.

6. Remove the protective film from the mirror surface before attempting calibration.



Mirror Alignment for Side Read Cameras

IMPORTANT: Mirrors for side-read or quadrant applications must be aligned perpendicular with the flanged edge of the mounting bracket using the outside edge of the alignment tool. Mark the bracket and write down the angle in case the mirror ever needs to be replaced.

Leveling the RangeFinder

Before beginning normal operations, the RangeFinder must be level with the conveyor surface. This is especially important to dimensioning applications.

WARNING: The RangeFinder uses visible red lasers and is rated as a Class 2 Laser Product. Do not look directly into the beam. Observe all safety precautions outlined in *Chapter 2.*

Prerequisites:

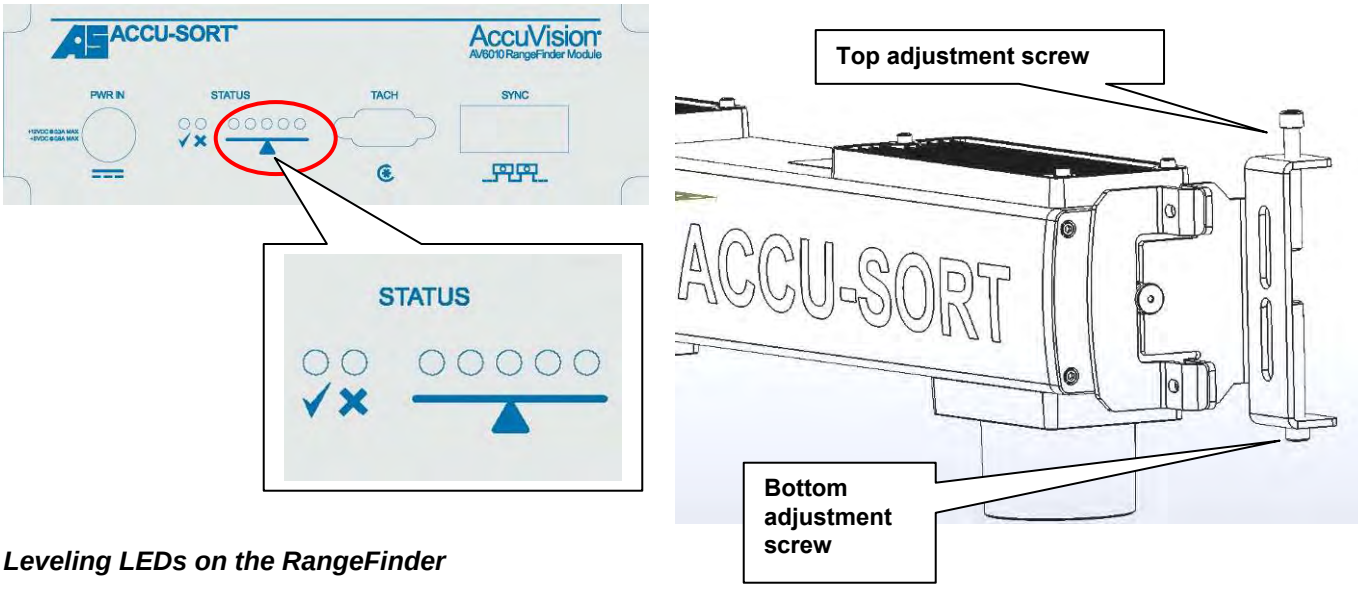
- RangeFinder software revision 6.0 (or greater)
- RangeFinder power must be ON during this procedure.
- Confirm correct mounting location (install drawings, Chapter 3)

Tools Required:

- Socket Driver (1/2")
- 5/32 Allen wrench

To level the RangeFinder:

1. Assure the mounting hardware is only finger-tight (4 places).
2. Check the five leveling LEDs on the RangeFinder. The lit LED is like the bubble on a standard level. If the center LED is lit, no adjustment is needed.
3. If one of the LEDs is lit to the left or right of center, make adjustments to the top and bottom adjustment screws on both sides of the RangeFinder until the center LED is lit.
4. Once level, tighten the mounting hardware.



Leveling LEDs on the RangeFinder

Blocking RangeFinder Codewords on Narrow Belts

In applications where the conveyor is less than 40-inches wide, it is necessary to block the RangeFinder laser pattern (also called codewords) that is projected beyond the edges of the conveyor.

WARNING: The RangeFinder uses visible red lasers and is rated as a Class 2 Laser Product. Do not look directly into the beam. Observe all safety precautions outlined in *Chapter 2.*

Prerequisites:

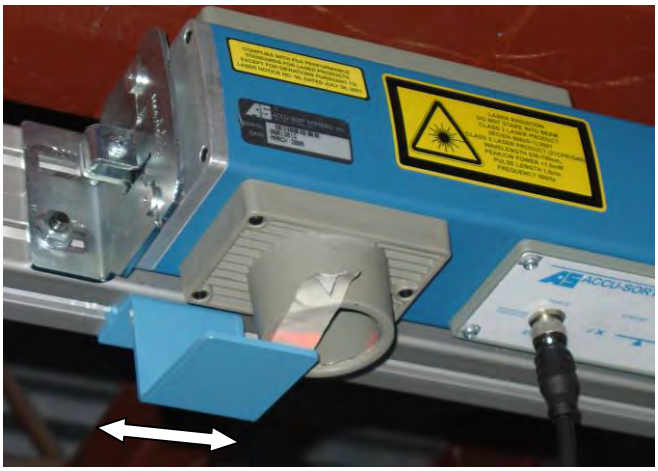
- Know the package flow (i.e., justified, non-justified) and usable belt width (i.e., width of conveyor in which packages appear in the scanning area)
- Remember: The RangeFinder cannot measure any further left and right than where the codewords end. Allow at least one inch (25.4 mm) of additional codewords to extend beyond the usable belt width.
- RangeFinder power must be ON to see the laser pattern on the belt.
- RangeFinder must be level.

Tools Required:

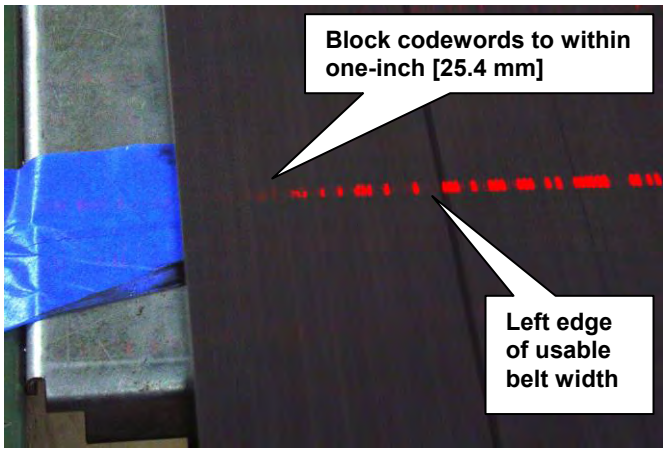
- Beam Blocker Kit (PN 1000067401, ships with RangeFinder)
- Socket Driver (1/2")

Install and adjust the beam blockers:

1. Mount the beam blockers to the structure.
2. Attach loosely with the hardware provided. Do not tighten.
3. While viewing the codewords on the belt, adjust the beam blockers to within one inch (25.4 mm) of the usable belt width on both sides by sliding them in the structure channel.
4. Once the correct amount of codewords are blocked, tighten hardware.



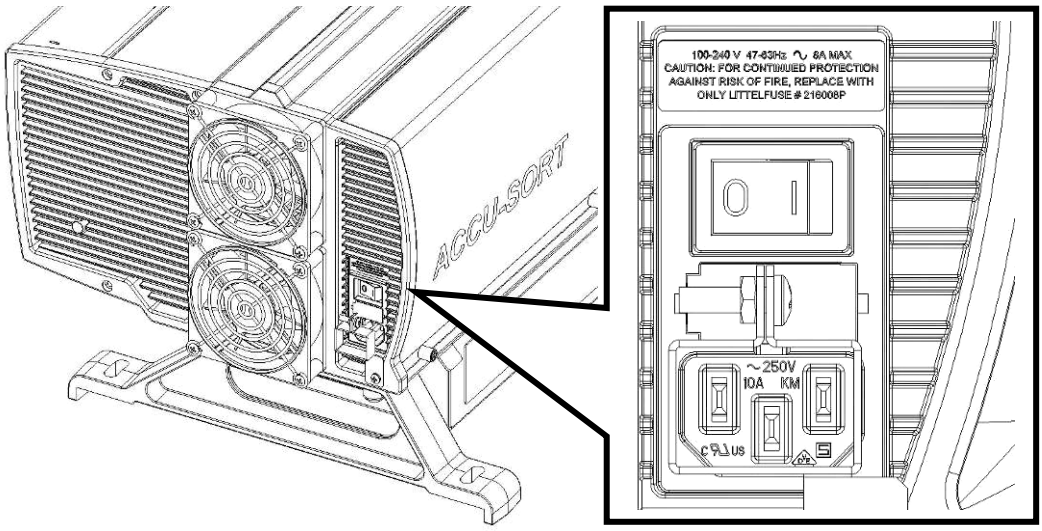
Beam blocker shown mounted to structure
(Tape shown to make beam exit visible. Do not use tape.)



Close-up of the RangeFinder's scan line pattern (codewords) along edge of conveyor

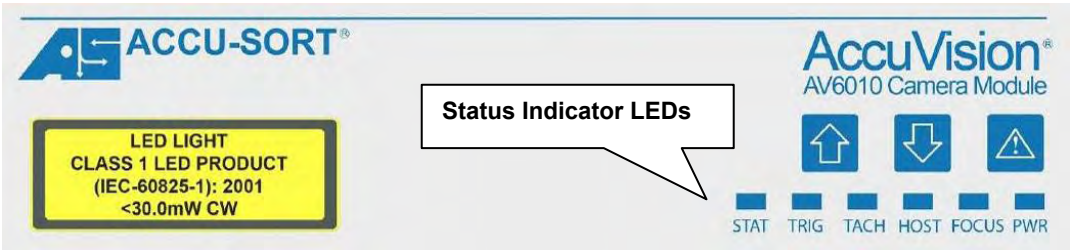
First-time Startup: Single Camera

1. Make sure all AV6010 system components are connected to the correct power source.
2. To start the AV6010 camera(s), apply power using the power switch.



3. On initial power-up, the AV6010 performs an initialization sequence.
4. The **PWR** LED flashes and turns a steady green, followed by **TRIG** (green) and **TACH** (amber). At the same time, the AV6010 illumination will turn on and remain on for approximately 30 seconds, then turn off.
5. The AV6010 automatically starts all application programs required during operations.
6. After a few minutes, the illumination flashes ON then OFF.
   (The system is ready for operation in approximately five minutes.)

   The **STAT** LED is solid green to indicate normal operation.



NOTE: During the startup sequence, you may proceed with *First-Time Setup* and establishing a connection to the AV6010 camera. Do not attempt a camera connection until the startup sequence is complete.

First-time Startup: Camera Tunnel using Power Distribution Box

Multi-camera applications, such as scanning arrays and tunnels, use the Power Distribution Box (PDB). The RangeFinder and all cameras are electrically wired to the PDB.

1. Assure the PDB AC power cord is properly wired to the power source.
2. Make sure all AV6010 system components are connected to the PDB.
3. Connect the PDB AC power cord to the PDB.
4. After connecting power to the PDB, the AV6010 cameras perform an initialization sequence as described on page 69.

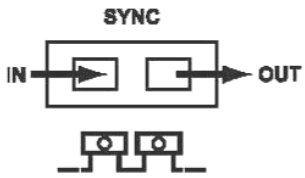
First-time Setup

The AV6010 browser-based user interface is the tool you will use to setup, change parameters, monitor operations, and diagnose problems.

To establish a connection and login:

1. Connect an Ethernet cable to your computer's Ethernet port and to the AV6010 camera SYNC network (either IN or OUT)

NOTE: You may need to disconnect a cable from one of these ports if an open one is not available. If you do so, remember to reconnect the SYNC camera network cable when you are finished with system setup.



WARNING: Only connect to the SYNC network during static calibration. Having a non-camera system connection to the SYNC network during normal operations may cause tracking problems.

2. Apply power to the AV6010 camera system.
   Wait approximately 4-6 minutes until the startup process is complete.
3. Using Internet Explorer, type the following address in the address box:

   http://xx.xx.xx.xx

   where **xx.xx.xx.xx** is the IP address of the AV6010.

NOTE: All AV6010 units ship as DHCP clients without any IP address. When proper startup is complete and a camera connection is established via the **SYNC** network, the DHCP controller camera will assume a static IP address of **192.168.0.50.** Use this IP address for first-time setup. You will need to obtain the correct IP address that will be used within the building from the system administrator. This will be used to establish a **HOST network** later.

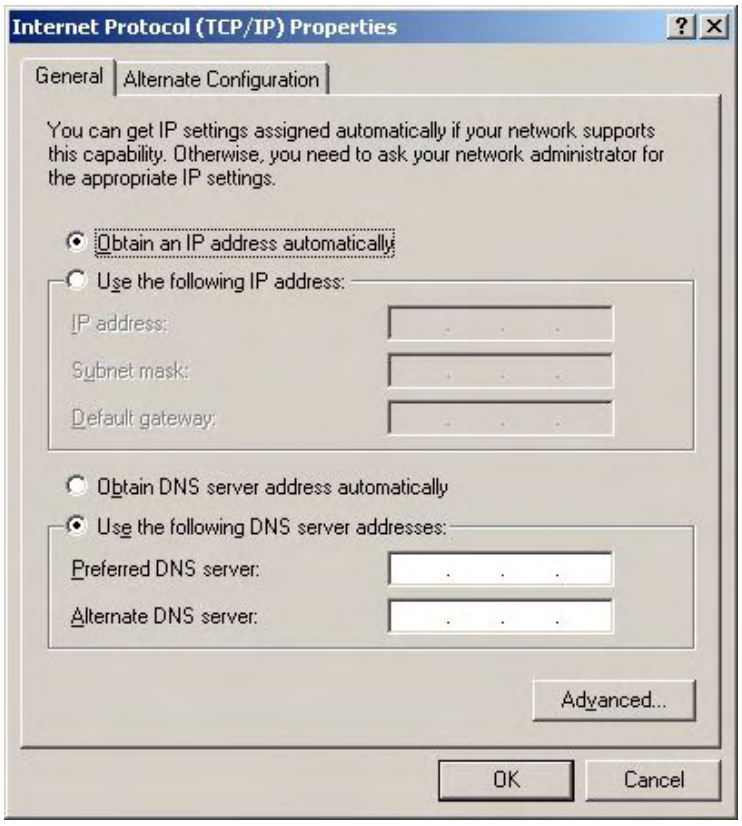
In a **multiple-camera system**, the camera with TACH wired to it assumes the 192.168.0.50 IP, becomes a DHCP server and assigns IP addresses to the other cameras. The RangeFinder remains a static IP (192.168.0.40).

4. The user interface **Login** screen is displayed.
   If your computer is set up for DCHP, it will obtain an IP from the AV6010 automatically. (*See "How to confirm your computer is setup for DCHP".*)
5. Select the User ID **Setup** from the drop-down menu in order to define the system parameters. (The **Monitor** User ID is used only to view and monitor systems operations.)
6. Enter the default **Password** ('setup' or 'monitor') in lowercase.
   The user interface Home page is displayed.

To change the password, see "How to set new passwords" under Diagnostics > Tools in Chapter 8.

How to confirm your computer is set up for DHCP:

1. Under Windows, go to the **Start** menu.
2. Select **Control Panel > Network Connections** and click **Network Connections.**
3. Click **Local Area Connection**.
4. Click **Internet Protocol**.
5. Click **Properties**.
6. Veirfy the window appears as shown below.
   'Obtain an IP address automatically' should be selected.
7. Click **OK**.



NOTE: There may be times when you need to use a 'static IP' setting in this window, for example, upgrading AV6010 system software. For details on setting a static IP, *see "How to use a static IP address".*

AV6010 User Interface

System Configuration

Use the System Configuration page to check that a connection is established with all AV6010 components in your system, assign a name to the system, and confirm (or set) the positions for each device.

Prerequisites: None.

To set the Name for the system and all camera positions:

1. Select **System Configuration** from the menu tree.
2. Enter a **Name** for your system.
3. Click the **Blink** button to confirm the camera connection and position. This will cause the illumination to flash on then off again.
   (If your application uses multiple cameras, each camera detected by the system will appear on the screen.)
4. Confirm the **Position** is properly set for the camera that is flashing it's illumination. Change the position using the drop-down menu, if necessary.
5. Perform Step 4 for every component in the system.
6. Click **Update** to save any changes.
7. Click **Reset** to return all parameters to the last values saved.

See also: System Configuration in Appendix B.

Tachometer

Use the Tachometer window to set key parameters that help define the camera system's timing during normal operations.

Prerequisites: You must know whether your system is using an external tachometer or will be requiring an internal tachometer setting for a specific number of feet per minute.

To set the system to use an External tachometer:

1. Select **Setup > Tachometer** from the menu tree. The Tachometer window is displayed.
2. Confirm the tachometer Source is set correctly for **External** tach. Change it using the drop-down list, if necessary.
3. When using an external tachometer, be sure to:
   a. Enter a **Resolution** in the field in tach pulses per inch. Typically set for either 16 or 20. (Resolution must be set to 20 if using dimensioning.)
   b. Enter a **Scale Factor.** No change required. Leave set as 1. (Change may be required in dimensioning applications.)
4. Click **Update** to save any changes.
5. Click **Reset** to return all parameters to the last values saved.

To set the system to use an Internal tachometer:

1. Select **Setup > Tachometer** from the menu tree. The Tachometer window is displayed.
2. Confirm the tachometer Source is set correctly for **Internal** tach. Change it using the drop-down list, if necessary.
3. Set an internal tach **Belt Speed** in feet per minute.
4. Click **Update** to save any changes.
5. Click **Reset** to return all parameters to the last values saved.

See also: Setup > Tachometer in Appendix B.

Focus and Detection

Use this window to set the key focusing and package detection requirements for your application.

Prerequisites: You must know your application requirements for:

- minimum/maximum package sizes (length, width and height),
- package spacing,
- conveyor width *(automatically set by the AV6010 Install Wizard),*
- focus source and
- package detection trigger source.

NOTE: It is recommended that the **Focus and Detection** parameters be set before running the **AV6010 Install Wizard** (also called the AutoCal Wizard).

To set the Focus and Detection configuration:

1. Select **Setup > Focus and Detection** from the menu tree.
   The Focus and Detection window is displayed.
2. Enter the **Minimum Package Size** dimensions (length, width and height).
3. Enter the **Maximum Package Size** dimensions (length, width and height).
4. Enter the **Minimum Package Spacing** (i.e., the minimum distance between packages being conveyed through the scanning area).
5. Confirm the **Conveyor Width**.
   (There is no need to enter the width here since it is automatically entered by the AV6010 Install Wizard.)
6. Confirm the **Focus Source** used by your system. Typically, this should be set for RangeFinder. Change, if necessary, to match your application.

   If you change the **Focus Source**, click **Update** first before selecting the **Package Detection Trigger Source**.
7. Select the **Package Detection Trigger Source**.
8. Click **Update** to save any changes.
9. Click **Reset** to return all parameters to the last values saved.

See also: Setup > Focus and Detection in Appendix B.

RangeFinder Mounting

Use the RangeFinder Mounting window to make adjustments the orientation, mounting position and front/back box tracking extensions.

NOTE: It is recommended that the **AV6010 Install Wizard** be used to set these parameters the first time. Through a series of setup wizards, you can 'teach' the system key parameters which results in auto calibration. The RangeFinder Mounting window can be used to adjust the dimensions as necessary to improve system performance.

Prerequisites:

- The **AV6010 Install Wizard** should be downloaded and installed on your computer.
- Use the **RangeFinder Wizard** to auto-calibrate these configuration settings.

To set the RangeFinder Mounting configuration:

1. Select **Setup > Mounting > RangeFinder** from the menu tree. Select the camera position that you want to configure (e.g., front, top, back, etc.). The window for the selected camera position is displayed.
2. Enter the **Mounting Angles** (roll, pitch and yaw).
3. Enter the **Mounting Position** (along belt, across belt and height).
4. Enter the **RangeFinder Ignore Limits** (left and right).
5. Enter the **RangeFinder Settings** as required by the application.
6. Click **Update** to save any changes.
7. Click **Reset** to return all parameters to the last values saved.

See also: Setup > Mounting > RangeFinder in Appendix B.

Camera Mounting

Use the Camera Mounting window to make adjustments to the orientation, mounting position and front/back box tracking extensions.

NOTE: It is recommended that the **AV6010 Install Wizard** be used to set these parameters the first time. Through a series of setup wizards, you can 'teach' the system key parameters which results in auto calibration. The Camera Mounting window can be used to adjust the dimensions as necessary to improve system performance.

Prerequisites:

- The **AV6010 Install Wizard** should be downloaded and installed on your computer.
- Use the **Camera Install Wizard** to auto-calibrate these configuration settings.

To set the Camera Mounting configuration:

1. Select **Setup > Mounting** from the menu tree. Select the camera position that you want to configure (e.g., front, top, back, etc.). The window for the selected camera position is displayed.

NOTE: Only the camera positions applicable to your system and assigned in the **System Configuration** window will have a Camera Mounting window selectable from the menu tree. The position selected will appear at the top of the active screen area in ( ) brackets.

2. Enter the **Camera Pitch Angle**.
3. Enter the **Camera Yaw (0 or 180).**
4. Enter the **Distance from Trigger** (X).
5. Enter the **Camera Offset** (Y).
6. Enter the **Mounting Height** (Z).
7. Confirm the **Far Working Distance**.
8. Enter the length for the front and back **Tracking Box Extensions.**
9. Click **Update** to save any changes.
10. Click **Reset** to return all parameters to the last values saved.

See also: Mounting > Camera Mounting in Appendix B.

Symbologies

Use the **Setup > Symbologies** window to add, modify or delete any of the symbologies that the camera system must decode. A unique name may also be assigned to each symbology on the **Active Symbologies** list.

Prerequisites: You will need to know the symbologies to be scanned and decoded by your system including:

- All symbology types to be 'found' by the system
- Any symbology-specific requirements
- Minimum/maximum code lengths
- Filtering required
- Minimum/maximum quantity of each code to be 'found'

NOTE: The calibration boxes supplied with the system include Code 39 bar codes. For first time setup, you can add Code 39 to the list to confirm the camera reads the codes on the calibration boxes.

Adding a symbology:

1. Assign a unique name for the symbology, if required.
   (If no entry is made, this defaults to the code type.)
2. Select a symbology from the **Code Type** drop-down list.
3. Assign a minimum code length.
4. Enter a maximum code length.
5. Enter a **Match Filter,** if necessary.
6. Enter a minimum quantity.
7. Enter a maximum quantity.
8. Click **Add**.
   The new code will appear in the **Enabled Symbologies** list.
9. Click **Update**.

Deleting a symbology:

1. Click on the option button to the left of the symbology to be deleted.
2. Click **Remove**.
   The selected symbology disappears from the **Enabled Symbologies** list.
3. Click **Update**.

Modifying a symbology in the Selected Symbologies list:

1. Position cursor in any data entry fields to be modified and double-click.
2. Enter the change.
3. Repeat for other fields requiring changes.
4. Click **Update**.

See also: Setup > Symbologies in Appendix B.

Communications Transmit Point

Use this window to set the transmit point for your application. In multiple camera / tunnel applications, each camera may have a unique transmit point setting.

Prerequisites: You will need to know the serial communications details:

- Baud rate, stop bits, parity, data bits, flow control,
- transmit message type and
- keep alive message.

NOTE: In applications using the VisionCapture / Image Depot Server (IDS), the transmit points for all cameras need to be greater than the Image Transfer transmit point.

The transmit point is always measured from the RangeFinder, even in applications that also include a photoeye.

To set the Transmit Point:

1. Select **Setup > Communications > (Camera) > Transmit Point** from the menu tree.
   The **Transmit Point** window is displayed.
2. Select a **Tracking Mode**.
   a. Trailing Edge
   b. Leading Edge
3. Set the **Distance to Transmit Point** (in inches).
4. Click **Update** to save any changes.
5. Click **Reset** to return all parameters to the last values saved.

See also: Setup > Serial Communications in Appendix B.

Serial Communications

Use this window to set the serial communications requirements for your application. In multiple camera / tunnel applications, each camera may have unique serial communication settings, if needed. At the very least, the **Transmit Point** settings will be different.

Prerequisites: You will need to know the serial communications details:

- Baud rate, stop bits, parity, data bits, flow control,
- transmit message type and
- keep alive message.

To set the serial communications:

1. Select **Setup > Serial Communications** from the menu tree.
   The Serial Communications window is displayed.
2. Select a **Baud Rate**.
3. Select a **Stop Bits**.
4. Select a **Parity**.
5. Select a **Data Bits**.
6. Select a **Flow Control.**
7. Select a **Transmit Message Type** from the drop-down list.
8. Enter a **Keep Alive Time (sec)**.
9. Enter a **Keep Alive Message**.
   This message is sent when the Keep Alive time expires.
10. Click **Update** to save any changes.
11. Click **Reset** to return all parameters to the last values saved.

See also: Setup > Serial Communications in Appendix B.

Host Network

Use this window to set the host network requirements for your application.

Prerequisites: You will need to know the host network communications details:

- IP address, gateway and netmask
- Connection type
- Message format

To set the Host Network:

1. Select **Setup > Communications > (Camera) > Host Network** from the menu tree. The Host Network window is displayed.
2. **IP Address Assignment**
3. **Host Network Port 1**

   a. Connection Type

   b. Message Format

   c. Port Number

   d. Keep Alive / Keep Alive Message
4. Repeat Step 3 for Host Network Ports 2 – 4 as required by your application.
5. Click **Update** to save any changes.
6. Click **Reset** to return all parameters to the last values saved.

See also: Setup > Communications > (Camera) > Host Network in Appendix B.

.

Image Network

Some applications use the optional AccuVision® VisionCapture™ Image Capture System to gather and store images. If your application utilizes the this system with an Image Depot Server (IDS), you will need to setup the Image Network screen.

Prerequisites: You will need to know the following:

- Imaging system networking requirements
- Transfer criteria
- Destination IP *(Standard ASI IDS IP 10.0.40.19)*
- Image Transmit Point

NOTE: While each camera may have separate *transmit points,* the Image Transfer transmit point is globally used by all cameras in the system.

It is recommended that the Image Transfer transmit point be set at least 5-inches [12.7 cm] shorter than the longest camera transmit point.

To set the Image Network:

1. Select **Setup > Communications > (Camera) > Image Network** from the menu tree. The Image Network window is displayed.
2. **IP Address Assignment**
   a. Choose between Static IP and Dynamic IP.
3. **Static Network Settings**
   a. Set IP Address. In multi-camera systems, each camera has a unique IP. The VisionCapture/IDS IP assignments for AV6010 are as follows:

Camera Position	IP Address	Camera Position	IP Address
Top Read	10.0.40.21	Front Read	10.0.40.24
Left-Side Read	10.0.40.22	Back Read	10.0.40.25
Right-Side Read	10.0.40.23	Bottom Read	10.0.40.26

   NOTE: No settings required for Dynamic IP Address Assignment
4. **Image Transfer** (Global to all cameras)
   a. Image Transfer Criteria
   b. Image Destination IP
   c. Maximum Transmit Point
   d. Image Cropping
   e. Downsampling
   f. Save Every xx image(s)
5. Click **Update** to save any changes or **Reset** to return all parameters to the last values saved.

See also: Setup > Communications > (Camera) > Image Network, Appendix B.

Advanced > Imaging (Camera)

CAUTION: Modifying any of these advanced parameters may adversely affect the operation of your camera system. Changes to these parameters should not be made unless recommended by an authorized Accu-Sort customer support technician.

Prerequisites: You will need to know the following:

- DPI at the far reading distance.
  (Automatically entered by the AV6010 Install Wizard.)

To set the advanced imaging functions:

1. Select **Setup > Advanced > Imaging > (Camera Position)** from the menu tree. The Imaging window is displayed for the camera selected.
2. **LPI (Lines Per Inch)**
   (The AV6010 Install Wizard takes the DPI at the far reading distance and enters it as the LPI to assure images do not appear elongated.)
3. **Gain**
   The options are **Normal** or **Fixed**. Normal allows the camera to change the gain dynamically for variations in package sizes. Fixed applies a fixed gain regardless of where in the DOF the package appears.
4. **Digital Zoom**
   When selected, Digital Zoom maintains the same DPI throughout the whole DOF. If not selected, the DPI is determined by the height of the package passing through the DOF.
5. **Image Mod**

   HW Correction *(default is enabled)*

   Binarization – *(Not available at time of publication.)*

   Digital Gain –This option digitally adds gain to the image to make the white area look brighter.

   Image Enhance – This option causes greater contrast in images (i.e., blacks appear darker and whites appear brighter) which improves the camera's ability to decode symbologies.

See also: Setup > Advanced > Imaging (Camera) in Appendix B.

Advanced > Decoder Options

CAUTION: Modifying the advanced parameters may adversely affect the operation of your camera system. Changes to these parameters should not be made unless recommended by an authorized Accu-Sort customer support technician.

Use this screen to define any advanced decoder options for the bar code symbologies the AV6010 is expected to read.

Prerequisites: You will need to know the following:

- Symbologies to be decoded
- Advanced decoder options required for the symbologies

To set the advanced decoder options:

1. Select **Setup > Advanced > Decoder Options** from the menu tree. The Decoder Options window is displayed.
2. Set the desired bar code options as needed for the symbologies defined in **Setup > Symbologies**.
3. In order to utilize these options you must have an advanced knowledge of the bar code symbologies to be read by the camera(s). Contact an Accu-Sort technical support for further assistance.

See also: Setup > Advanced > Decoder Options in Appendix B.

Dimensioning Setup and Calibration

Some applications use the optional AV6010 dimensioning module for dimension-weighing-scaling and / or revenue recovery applications.

Prerequisites: You will need the following:

- Top-read camera must include a DCM with the dimensioning module
- All wizard calibrations must be completed (system “tracked in”)
- Dimensioning calibration box or calibration test patterns
- Laptop with Install Wizard connected to camera system

To set the dimensioning functions:

You need to make settings/adjustments in the following AV6010 user interface windows:

- Symbologies
- Tachometer
- Camera Mounting (Top only)
- Imaging (Top only)
- Dimensioning

Tachometer Settings for Dimensioning

1. Select **Setup > Tachometer** from the menu tree.
   The Tachometer window is displayed.
2. Confirm the **External Tachometer Resolution** is set for 20.00 pulses/inch.
3. Set the **Scale Factor** to 1.00.

NOTE: This is the setting that compensates for length of the package. As the Scale Factor is reduced the package is reported longer. For example: If a package is dimensioned shorter than it actually is, decrease the Scale Factor by very small amounts until the system reports the actual box size. Start by adjust the thousandths value.

4. Click **Update**.

Top Camera Mounting Settings for Dimensioning

1. Select **Setup > Mounting > Top** from the menu tree.
   The Camera Mounting (Top) window is displayed.
2. Set the **Camera Pitch Angle** to 8.0 degrees.

NOTE: The top-read camera's mirror must be set for an angle of 8-degrees (± 1). If it is not set for an 8-degree angle, perform the mirror alignment procedure and then re-run the install wizard before continuing with the dimensioning setup.

3. Click **Update**.

Symbologies Settings for Dimensioning

1. Select **Setup > Symbologies** from the menu tree.
   The Symbologies window is displayed.
2. Select **ASI Diagnostics** from the **Code Type** drop-down list.
   ASI_Diagnostics will appear as a Symbology under Enable Symbologies.
3. Enter a name in the Name field for ASI Diagnostics (e.g., ASIDIAG).
4. Click **Add**.
5. Select **Dimensions** from the **Code Type** drop-down list.
   Dimensions will appear as a Symbology under Enable Symbologies.
6. Enter a name in the Name field for Dimensions (e.g., ASIDIM).
7. Click **Add**.
8. Click **Update**.

Top Camera Imaging Settings for Dimensioning

1. Select **Setup > Advanced > Imaging > Top** from the menu tree.
   The Imaging (Top) window is displayed.
2. Set the **LPI** to the same value as the DPI of the top-read camera at the far reading distance.
3. Enable the **Digital Zoom Mode** (check in checkbox).
4. Click **Update**.

Dimensioning Settings

1. Select **Setup > Options > Dimensioning** from the menu tree. The Dimensioning window is displayed.
2. Set the **Package Height Options:**
   a. Variation Threshold to 0.2
   b. Accuracy to 0.2 inch.
3. Set the **Package Length/Width Options:**
   a. Confidence Threshold to 50
   b. Accuracy to 0.2 inch
4. Set the **Certified Package Size Options** for **Minimum Package Size** (Length, Width and Height).

NOTE: The minimums cannot be set less than 12 times the accuracy or 4-inches, whichever is greater.

5. Set the **Certified Package Size Options** for **Maximum Package Size** (Length, Width and Height).

NOTE: The maximum length allowed is 72-inches [1828.8 mm]. The maximum width or height allowed is 36-inches [914.4 mm].

6. Advanced Options > Length Determined by…
7. Click **Update**.

Calibrating the Dimensioning System

1. Start the conveyor belt. Allow it to run for a few minutes until the RangeFinder has had time to SYNC with the cameras.
2. Select **Diagnostics > System Status** and confirm that all the cameras and RangeFinder are reporting OK. If not, click on the specific device to determine the problem and resolve it.
3. Run the dimensioning calibration box down the center of the belt with as little skew as possible where the 36” side is aligned with the belt.
4. The remote display should have read either **Calibration Success** or **Calibration Failure**.
5. If **Calibration Success** is displayed, continue with *Setting the Cert Mode*.
6. If **Calibration Failure** is displayed, go to **Diagnostics > Top Camera > Logging** and look for the reason why the failure occurred.

   For example: If a line in the log indicates that the *DPI factor failed* then manually adjust the **DPI Scale Factor** on the **Dimensioning** screen and repeat the dimensioning calibration procedure.

IMPORTANT: The dimensioning auto calibration limits the magnitude of changes it will make to any parameter in order to assure improper changes are not made due to using the wrong calibration box, etc.

Setting the Cert Mode

1. Select **Setup > Advanced > Dimensioning** from the menu tree. The Dimensioning window is displayed.
2. Set the **Cert Mode** to **Cert On – English**.
3. Click **Update**.

AV6010 Install Wizard

Use the **AV6010 Install Wizard** application as a simplified method of determining the mounting information needed in the AV6010 user interface under the **Mounting > Ranger** and **Mounting > Camera** setup screens.

Based on your application, there can be several auto calibration wizards made available through the AV6010 Install Wizard application including the RangeFinder and one for each camera in the system.

Prerequisites: You will need to establish a connection with an AV6010 camera before you can download the install wizard.

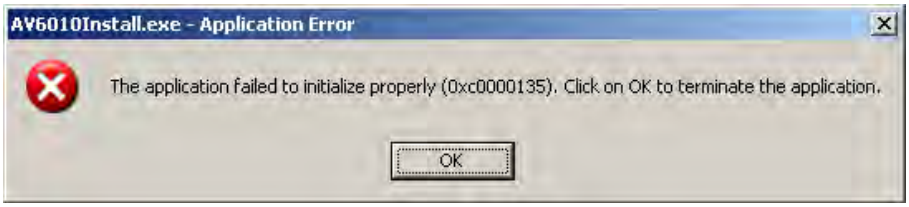
To download the AV6010 Install Wizard:

1. In the AV6010 user interface, select **Diagnostics > Tools**.
2. Under **Downloads**, select **InstallWizard.zip**.
3. In the **File Download** dialog box, click **Save**.
4. Define the location on the C: drive where the wizard will be saved. It is recommended that you create an Accu-Sort folder in the Program Files folder on your C: drive (e.g., C:\Program Files\Accu-Sort).
5. Click **Save**. The ZIP file will take several seconds to download.
6. Click **Close** when **Download Complete** appears.
7. Go to the C:\Program Files\Accu-Sort location and open the **InstallWizard.zip** file.
8. Double-click **AV6010Setup_1.1.3.msi** file.
9. The **AV6010 Calibration Software Setup Wizard** will open in a new window.

NOTE: If you have previously installed the software, the wizard will offer the choice to **Repair** or **Remove** the software version it found on your computer.

10. Follow the wizard's instructions to install the AV6010 Calibration Software.
11. Once installation is finished, the **AV6010 Install Wizard** icon should appear on your desktop.

NOTE: If your computer does not have the Microsoft's .NET framework installed, this error will display when you launch the AV6010 Install Wizard:



To download the Microsoft .NET framework:

1. To find and install the Microsoft .NET framework needed in order to run the AV6010 Install Wizard go to:

http://search.microsoft.com/results.aspx?mkt=en-US&setlang=en-US&q=.NET+framework

2. Find the following Windows Support File utilities:

- Windows Installer 3.0 Redistributable (WindowsInstaller-KB884016-v2-x86.exe)
  http://www.microsoft.com/downloads/details.aspx?familyid=5FBC5470-B259-4733-A914-A956122E08E8&displaylang=en
- Microsoft .NET Framework Version 2.0 Redistributable Package (x86) (dotnetfx.exe)
  http://www.microsoft.com/downloads/details.aspx?FamilyID=0856EACB-4362-4B0D-8EDD-AAB15C5E04F5&displaylang=en
- Microsoft's .NET utilities for Visual C++ 2005 Redistributable Package (x86) (vcredist_x86.exe)
  http://www.microsoft.com/downloads/details.aspx?FamilyID=32BC1BEE-A3F9-4C13-9C99-220B62A191EE&displaylang=en

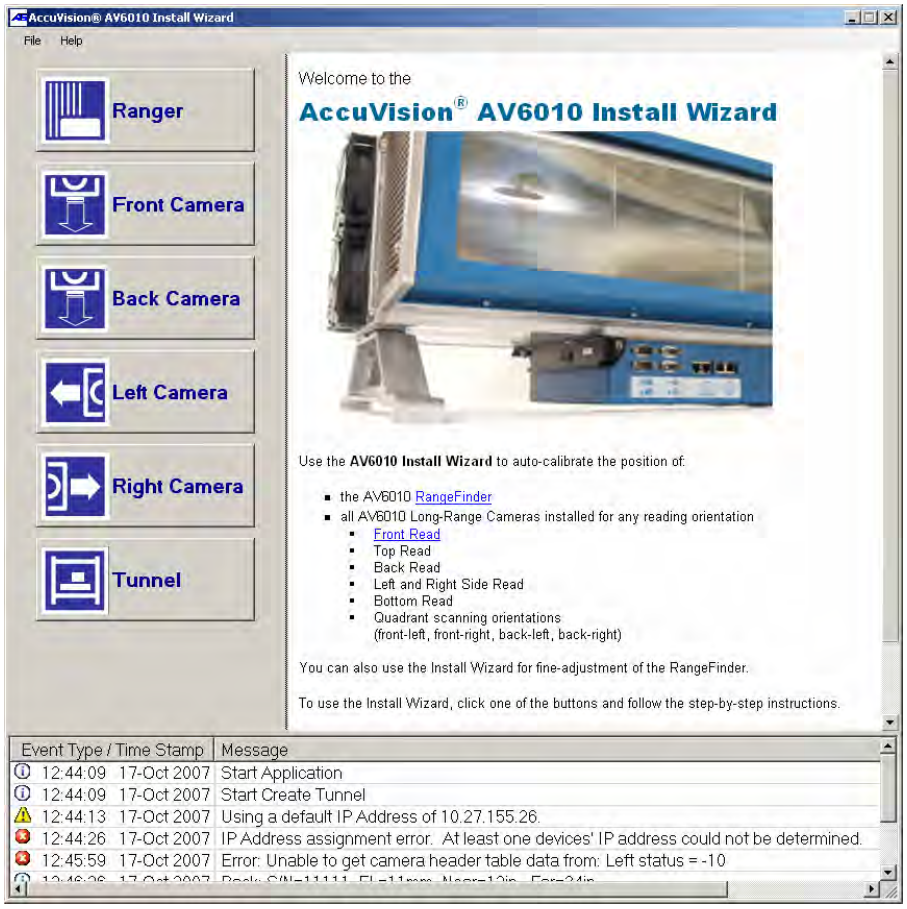
3. Save the files to your computer.

4. Install the files in the order listed above.

To open the AV6010 Install Wizard:

1. Locate the icon on your desktop.

2. Double-click the icon to open the wizard.
3. The AV6010 Install Wizard screen is displayed.



RangeFinder Wizard

This wizard is used to learn the RangeFinder's position over the conveyor, including the usable conveyor (region of interest) and height above the conveyor surface.

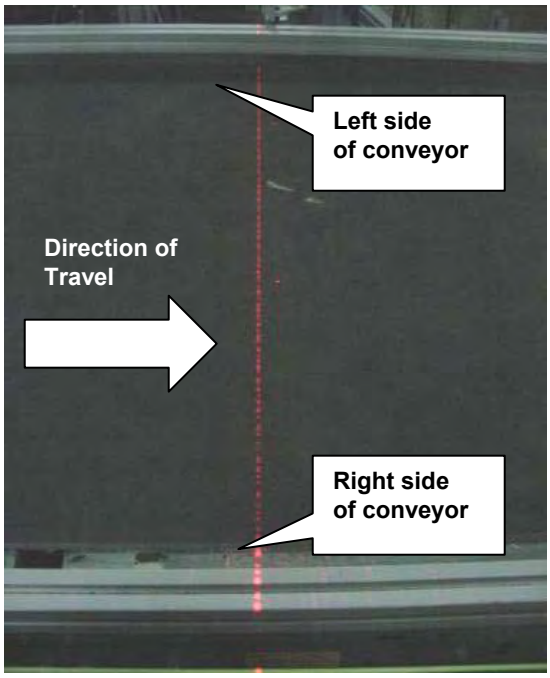
Prerequisites:

- Calibration box
- Tape measure
- Confirm the RangeFinder is centered over the scanning area
- Confirm the RangeFinder is level and that excess codewords are blocked if the application is using a narrow belt (under 40-inches)
- Laptop with Install Wizard connected to camera system

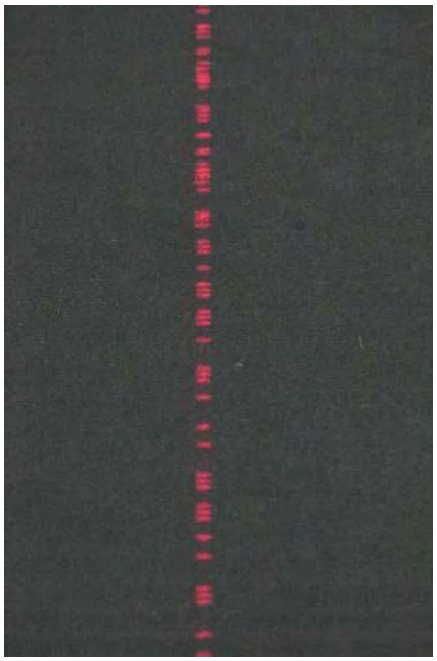
To auto-calibrate the RangeFinder:

1. Click the **RangeFinder Wizard** button.
2. Set the **Mount Selector** and click **Next**. (Normally left as **Standard**.)
3. Confirm the RangeFinder scan line is perpendicular to the conveyor's direction of travel using a calibration box.
4. Learn the **Region of Interest**.
   a. Measure the conveyor width used by the application.
   b. Measure the usable conveyor from:
      i. Left edge to the left-side RangeFinder spot.
      ii. Right edge to the right-side RangeFinder spot.
   c. Enter the three measurements in the wizard and click **Next**.
5. Confirm **Height Above Conveyor Surface** using a calibration box.
6. Use the **Summary** to review the position information that will be sent to the camera system.
7. Click **Finish** to save the RangeFinder position information to the camera system.
8. Continue with the **Camera** wizard.

NOTE: It is recommended that these numbers not be changed.

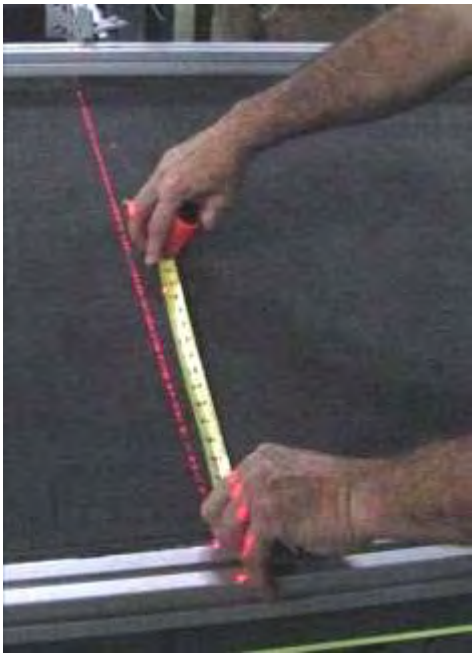


RangeFinder's scan line on conveyor, edges of usable belt shown

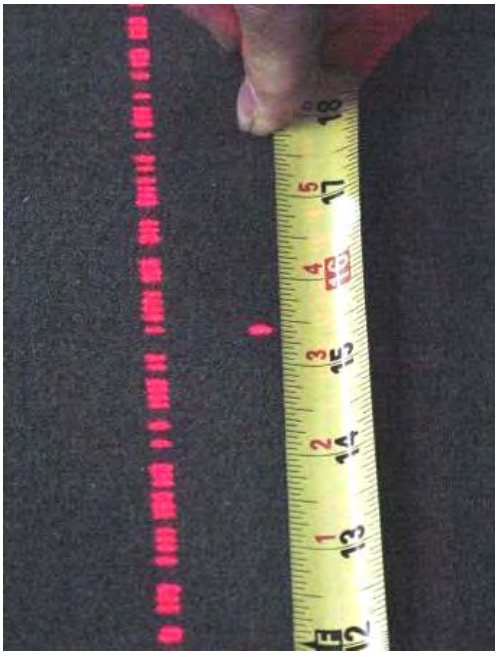


Close-up of the RangeFinder's scan line pattern (code words)

RangeFinder Scan Line



Measuring from edge of conveyor to the alignment dot



Close-up of measuring to the alignment dot

Measuring to determine the Region of Interest

Photoeye Wizard

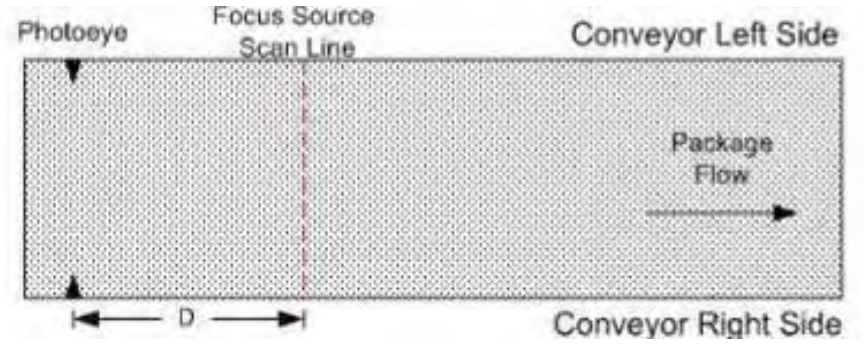
This wizard is used to setup a photoeye as the package detection / trigger source for the camera system.

Prerequisites:

- Photoeye must be installed at the correct location a minimum of 6.0 inches [152 mm] upstream from the RangeFinder or light curtain. *(See the installation drawings provided with the system.)*
- Photoeye must be set as the package detection trigger on **the Focus and Detection** page of the AV6010 User Interface
- Tape measure
- Laptop with Install Wizard connected to camera system

To setup the photoeye:

1. Click the **Photoeye Wizard** button.
2. Measure the distance from the photoeye to the scan line of the focus source (either RangeFinder or light curtain). Enter this measurement in the **'D: Photoeye to Focus Source Distance'** field.



3. Enter the **Photoeye Debounce Distance**.
   This distance should always be a positive value and less than the distance to scan line (D). It is recommended that the difference between these two distances be at least 5.0 inches.
4. Set the **Photoeye Active Level** either Low or High depending on the photoeye used. *(The default is preset to Active Low for the Accu-Sort photoeye.)*
5. Click **Next**.
6. Click **Finish** to save the photoeye position information to the camera system. Wait until the **System Parameters Update** is completed.
7. Continue with the **Camera** wizard(s).

NOTE: It is recommended that these numbers not be changed.

Light Curtain Wizard

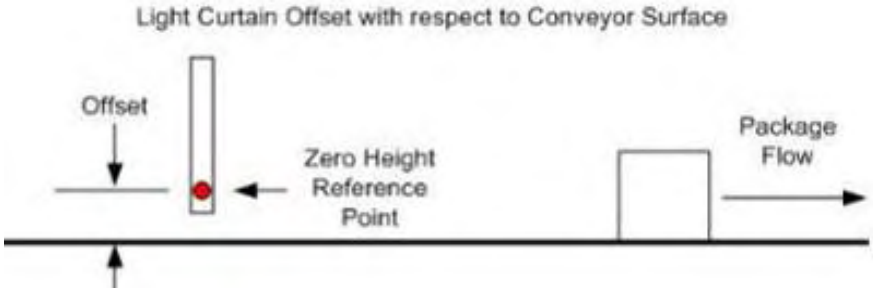
This wizard is used to setup a light curtain as the trigger source.

Prerequisites:

- Light curtain must be installed at the correct location *(reference the installation drawings provided with the system)*
- Light curtain must be set as both the focus and the package detection trigger on **the Focus and Detection** page of the AV6010 User Interface
- Tape measure
- Laptop with Install Wizard connected to camera system

To setup the light curtain:

1. Click the **Light Curtain Wizard** button.
2. Measure the offset between the light curtain's zero height reference point and the conveyor's surface. Enter this measurement in the **Light Curtain Height Offset** field. The height offset is a positive value when the light curtain's zero height reference point is located above the conveyor surface.



3. Click **Next**.
4. Click **Finish** to save the light curtain position information to the camera system. Wait until the **System Parameters Update** is completed.
5. Continue with the **Camera** wizard(s).

NOTE: It is recommended that these numbers not be changed.

Top Camera Wizard

This wizard is used to learn the Top camera's position.
Setup for Top, Top-Front or Top-Back cameras is similar.
The icon will appear different based on the camera orientation.

Prerequisites: Know the top camera angle required by the system. It will be one of the following:

- 15-degrees (positive angle)
- 15-degrees (negative angle)
- 8-degrees (positive angle, used in dimensioning systems)
- RangeFinder must already be calibrated
- Mirror must already be aligned

Tools Required:

- Small calibration box
- Camera Scan Line Target
- Static Focus Target
- Tape measure
- Laptop with Install Wizard connected to camera system

NOTE: The Small Calibration Box and targets are provided in the **AV6010 Setup & Calibration Kit** (part number 111456001). The targets are also available from the AV6010 user interface. Go to: **Diagnostics > Tools** and click the **Utilities and Documentation** link.

To auto-calibrate the Top Camera:

Follow the camera wizard's instructions to perform the static auto-calibration.

1. Click the **Top Read** Wizard button.
2. Set the **Top Camera Angle Orientation Selector** for either Top-Front or Top-Back. Camera angle facing upstream is negative (Top-Front). Camera angle facing downstream is positive (Top-Back).
3. Use the Camera Scan Line Target to determine the distance from the camera to the focus source (RangeFinder). Enter this measurement as the **X Scan Offset**.
4. Use the small calibration box and Camera Scan Line Target to determine the **X Distance.**
5. The system uses the previously entered information to compute the camera's read angle. Do not change unless otherwise instructed.
6. Use the Static Focus Target to determine the camera's far working distance.
7. Review the **Calibration Results Summary** for the camera.

NOTE: The wizards for other camera orientations function in a similar manner. Follow the camera wizard's step-by-step instructions to complete the auto-calibration for a multi-camera system.

Dimensioning Wizard

This wizard is used to verify the AV6010 auto calibration for dimensioning.

Prerequisites: You will need the following:

- All previous wizard calibrations must be completed
- Need the ASIDIM and ASICAL boxes
- Laptop with Install Wizard connected to camera system

To run the Dimensioning wizard:

1. Click the **Dimensioning Wizard** button.
2. Turn on the conveyor.
3. Run the **ASIDIM** box through the system.
4. If the ASIDIM box is properly dimensioned by the system, calibration is not needed.
5. If the ASIDIM box is not properly measured, the system changes to a ***'NOT READY'*** mode.
6. In order to correct this, the **ASICAL** box must be run to calibrate the system.

See also: Dimensioning Setup and Calibration and Appendix G.

Dynamic Focus Calibration

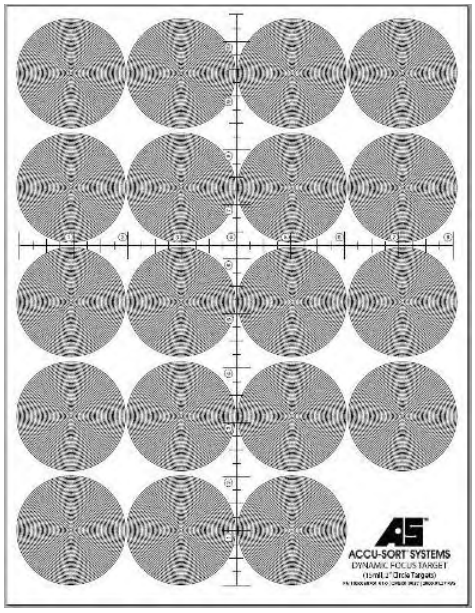
Before beginning normal operations, the cameras need to be dynamically focused.

Prerequisites:

- All cameras have been setup using the AV6010 Install Wizard
- Laptop must be connected to a camera's IMAGE port *(see Connecting to the IMAGE Network)*
- AV6010 User Interface and Camera Image Viewer should both be open on the laptop's desktop

Tools Required:

- Camera Image Viewer (AV6010_Realtime_Viewer.exe icon) *(Available as a download on the Diagnostics > Tools page)*
- Dynamic Focus Target attached to a calibration box *(Available as a download on the Diagnostics > Tools page)*
- AV6010 User Interface

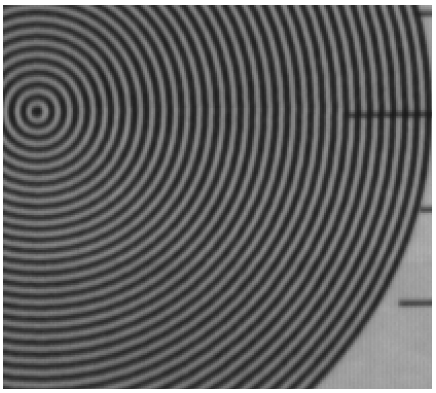


IMPORTANT: Dynamic camera setup should be performed by a trained and authorized Accu-Sort technician. They will verify normal operations and make calibration adjustments as necessary. This procedure is for reference purposes only.

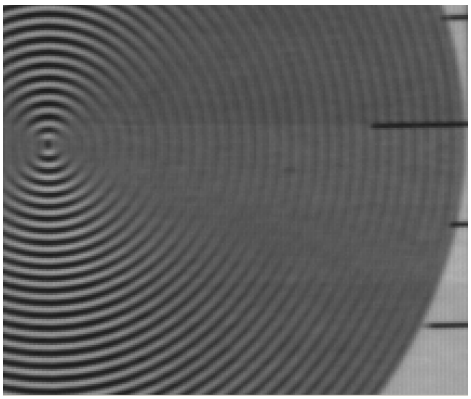
For further information on training, contact us at 1-800-BAR-CODE.

To dynamically focus a camera:

1. Open the **Camera Image Viewer**.
2. In the **View Menu**, enable **Show Extra Info, Plot FocusRange** and **Package Corner**.
3. In the **IDS Menu**, be sure it is **Enabled**.
4. Also enable **Delete Image After Display**. When the box is run through the system again, the new image automatically replaces the previous image.
5. Select the **Camera IP** for the unit to be dynamically focused. Click **Enable**.
6. Start the conveyor.
7. In the AV6010 User Interface, go to **Diagnostics > System Status**. Confirm the **Device Status** is OK and the **Belt Speed** is shown in FPM.
8. Make sure the Dynamic Focus Target is on the side of the calibration box that faces the camera to be focused. Run the box past the camera.
9. On **Diagnostics > System Status**, confirm the Package Count is incremented by one.
10. Go to **Diagnostics > Images**. Confirm that there is an image displayed.
11. Go to the **Camera Image Viewer** to view the captured image of the box. (Reference the examples of both 'good' and 'bad' focus.) Depending on your results, adjustments may be required.
12. Confirm and adjust the **Distance to Trigger**, if needed.
13. Confirm and adjust the **Camera Pitch Angle**, if needed.
14. Adjust the **Image Gain**, if needed.
15. Adjust the **LPI**, if needed.
16. Adjust the **Focus Mounting Height** as needed.
17. Check the **Camera Yaw**.
18. Check the **Camera Offset**.
19. Repeat this process for each camera in the system.



Good Focus



Bad Focus

Side-by-Side Package Detection Setup

Prerequisites:

- Top Camera (*mounted at +15 degrees or less)*
- Software versions (AV6010 Camera v6.0 and RangeFinder v8.0)
- System has been properly setup with Install Wizard
- Confirm all application parameters are correctly entered in the AV6010 user interface (e.g., min and max box sizes)
- Image cropping lines properly set during initial camera setup

Tools and Materials Required:

- Connection to a camera in the system using SBS
- Camera Image Viewer *(version 6.0 or newer)*
- Sample packages to create side-by-side conditions

Getting Started

1. Establish a connection with the top camera and open the AV6010 user interface. (In a multi-camera system, this connection can be established with any camera via the IMAGE network. See *Connecting to the IMAGE Network*.)

IMPORTANT: Do NOT connect to the SYNC network.

2. Select **Setup > Options > Side-by-Side > Settings** from the menu tree. The **Side-by-Side** window is displayed.

3. Under **Side-by-Side Licensing**, set **Side-by-Side Camera** to Top. *(Currently, only the top-read camera can be licensed for SBS.)*

IMPORTANT: The system can be licensed before or after setup and calibration is complete. A license key must be obtained, entered and verified before SBS can be used for normal operations. An Accu-Sort trained and authorized technician must obtain the key and register an AV6010 for SBS. For additional information, contact Accu-Sort at 1-800-BAR-CODE.

4. To calibrate the system prior to licensing, use the **Test Mode**. (This mode is limited to 500 triggers.) This can be selected from the **Side-by-Side Enabled** drop-down list.

5. Click **Update**.

6. Go to **Setup > Options > Side-by-Side > Ignore Codes** in the menu tree.

7. Define any ‘match codes’ that the system should ignore even if a side-by-side (SBS) condition is identified.

8. Click **Update**.

Setup Camera Image Viewer

1. Launch the **Camera Image Viewer**.
   (To perform SBS setup, version 6.0 is required.)

2. In the **View** drop-down menu, select both **Show Extra Information** and **View SBS Information**.

3. Set the **Cam IP** to match the IMAGE port IP address of the top-read AV6010 camera.

4. Set the **IDS IP** to match the IP address of your laptop.

5. In the **IDS** drop-down menu, confirm that **Enabled** is checked and that **Delete Image After Viewing** is NOT checked. This allows images to be saved to the laptop.

6. Click the **Enable VisionCapture** button at the top right-hand of the viewer.

7. Go to the **Tools** drop-down menu and enable **Side-by-Side Detection**.

8. Confirm **Down Sample** is set to 16.

9. On the viewer's Side-by-Side **Setup** tab, click the **Read Parameters from Camera** button. This gets the current parameters from the camera.

10. Select the transport type. (See *Setup for Transport Type*.)

11. Confirm that the following are enabled (checked):

    - **Post Process Displayed Images**
    - **Crop Images to Image Valid**

12. Continue SBS setup with *Capture Images.*

Setup for Transport Type

To set SBS to work with Belt Conveyors:

1. Select the **Setup** tab in the Image Viewer.
2. Select **Black Conveyor Belt** from the drop-down menu.
3. Select the **Calibration** tab.
4. Confirm **Use Step-by-Step Tutorial** checked.
5. Click the **Enable Calibration** button.
6. Follow the tutorial steps provided in the Image Viewer to set the **Image Left/Right Limits**:
   - Set Maximum Left Pixels.
   - Set Maximum Right Pixels.
7. After setting the transport type, continue with *Capture Images*.

To set SBS to work with Tilt-Tray Conveyors:

1. Select the **Setup** tab in the Image Viewer.
2. Select **Light Colored Tilt-Tray** from the drop-down menu.
3. Select the **Calibration** tab.
4. Confirm **Use Step-by-Step Tutorial** checked.
5. Click the **Enable Calibration** button.
6. Follow the tutorial steps provided in the Image Viewer to set the following:
   - **Image Left/Right Limits**
   - **Tray Dimensions**
   - **Tray Bolt Filter**
   - **Misc Object Filter**
7. After setting the transport type, continue with *Capture Images*.

Capture Images

IMPORTANT: The objective is to collect images for a representative sample of the live freight running through the system. This sampling should include a full variety of packages representing typical product flow. Be sure this includes collecting images of SBS conditions. If enough of these occur during normal operation, that should be sufficient. If not, it may be necessary to create some artificial conditions and save the images.

1. Run at least 200 singulated boxes through the system.
2. As images are captured, they appear as a list of filenames below the three tab-sections on the left-hand side of the Viewer.
3. If there are known SBS conditions that occur, assure they'll occur during the test run or create some sample SBS test conditions.
4. Run the sample SBS test conditions through the system, if any.
5. Once enough packages have run through the system, click **Disable VisionCapture** to disable the image capture mode.
6. Continue with *Evaluate Images.*

Evaluate Images

1. Go to the Image Viewer's SBS **Detection** tab.
2. Confirm the first image filename listed in the viewer is selected.
3. Click **Label Images (AUTO Mode)** button.
4. In the **Label Image** pop-up dialog box select either **Single Object** or **Multiple Objects** based on what is shown in the captured image. After reviewing an image, it is labeled as either:
   - MARKED: SINGLE PKG
   - MARKED: MULTI PKG
5. Repeat the **Label Image** process for all captured images.
   (Use the **Previous Image** button to go back one image and change the label, if needed.)

NOTE: Use **Label Current Image** button to correct any mis-labeled images, one at a time.

6. Click the **Process Image and Calc Results** button.
7. The calculated results are displayed in the **SBS Rate** dialog box.
   (See Understanding the SBS Rate in Appendix B.)
8. Continue with *Optimize SBS Calibration.*

Optimize SBS Calibration

1. On the **Detection** tab, use the **SBS Detection Sensitivity** slider bar to adjust sensitivity higher by one. (Default is 3.)
2. Click **Process Images and Calculate Results.**
3. The **SBS Rate** dialog box appears. Make a note of the percentages.
4. Adjust the slider again, only this time, lowering the sensitivity.
5. Perform this procedure several times, raising and lowering the sensitivity while making a note of the **SBS Rate** percentages.
6. Compare the **SBS Rate** of each adjustment and determine the sensitivity setting that is best for the application's conditions (i.e., the highest possible percentage for the SBS Rate).
7. Once the highest **SBS Rate** is set, click the **Process Images and Set Parameters** button.
8. A **Time Warning** dialog box is displayed. This takes about three-seconds per image. Click **Yes** to allow the system to process images.
9. A progress monitor is displayed. A **Best Settings** dialog box is displayed when the process is complete.
10. Click the **Save Parameters to Camera** button.
11. Setup is complete and the system is ready for normal operations.
12. During normal operations, monitor the number of 'false negatives' and 'false positives' that occur. Depending on the application's requirements and how SBS conditions are handled, it may be necessary to make adjustments to reduce the number of false negatives and false positives.

NOTE: In the AV6010 user interface, go to **Diagnostics > System Status** to view the SBS results.

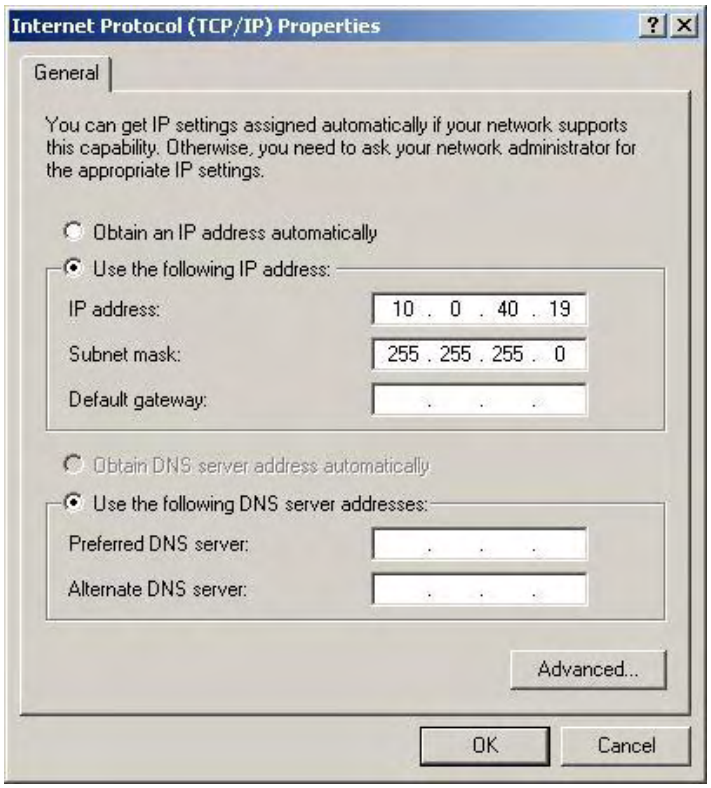
Perform this procedure seasonally if package flow and variations of package types vary.

Connecting to the IMAGE Network

Before attempting to connect to a camera's IMAGE port, you need to set the laptop computer's static IP address as shown here.

How to use a static IP address:

1. Under Windows, go to the **Start** menu.
2. Select **Control Panel > Network Connections** and click **Network Connections.**
3. Click **Local Area Connection**.
4. Click **Internet Protocol**.
5. Click **Properties**.
6. Verify the window appears as shown below.
   'Use the following IP address' should be selected.
7. Enter the following:
   IP address: 10.0.40.19 *(default IP for IMAGE network)*
   Subnet mask: 255.255.255.0
8. Click **OK**.
9. Connect the laptop to the IMAGE port of a camera.



Setting a Static IP address to access IMAGE network

Download Camera Image Viewer

To download and install the Camera Image Viewer:

1. Establish a connection with the AV6010 user interface.
2. Go to **Diagnostics > Tools** in the menu tree.
   The Tools screen is displayed.
3. Under **Downloads**, click the **Utilities and Documentation** link.
4. Select the **ImageViewer.zip**.
5. Open the zip file and copy the Image Viewer into a separate folder.

IMPORTANT: To perform side-by-side package detection setup with the Image Viewer, version 6.0 or newer is required.

View / Load Parameter Files

Use this diagnostics tool to:

- View the XML parameter file
- Load an XML parameter file to the camera system from a laptop computer
- Save a backup copy of the XML parameter file to a laptop computer.

NOTE: After completing the initial system setup, it is recommended that a copy of the XML parameters file be saved for future reference. This is especially useful for single camera installations.

For details, see Diagnostics > Tools in Chapter 8.

Set Passwords

As part of the initial system setup, it is recommended that you change the **Setup** and **Monitor** passwords from the Accu-Sort defaults.

For details, see Diagnostics > Tools in Chapter 8.

Update Software

If it becomes necessary to update your AV6010 software, this can be done using the **Load Image** or **Load Patch** functions.

CAUTION: Do not use the update software functions unless it is recommended to do so by Accu-Sort technical support.

For details, see Diagnostics > Tools in Chapter 8.

6 Operations

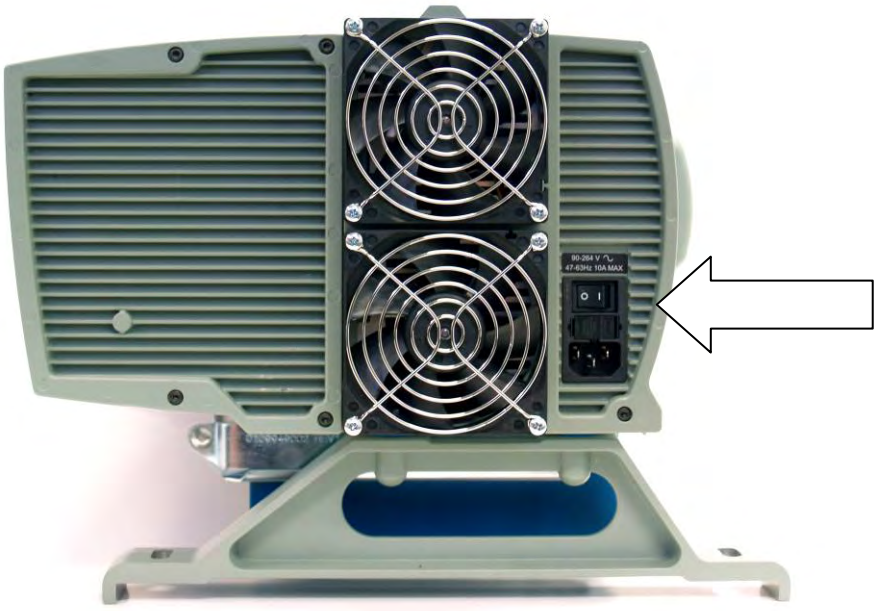
This chapter provides details on how the AV6010 Long-Range Camera System functions during normal operation. It also outlines how you can verify optimal performance through several methods:

- Become more familiar with your application
- Step-by-step start-up operations checklist
- Status Indicator LEDs
  - AV6010 Camera
  - RangeFinder
- Diagnostics / monitoring to confirm normal operations

After configuring your system using the **AV6010 setup wizard and browser-based setup application,** use the operations checklist to verify normal operations.

AV6010 Startup

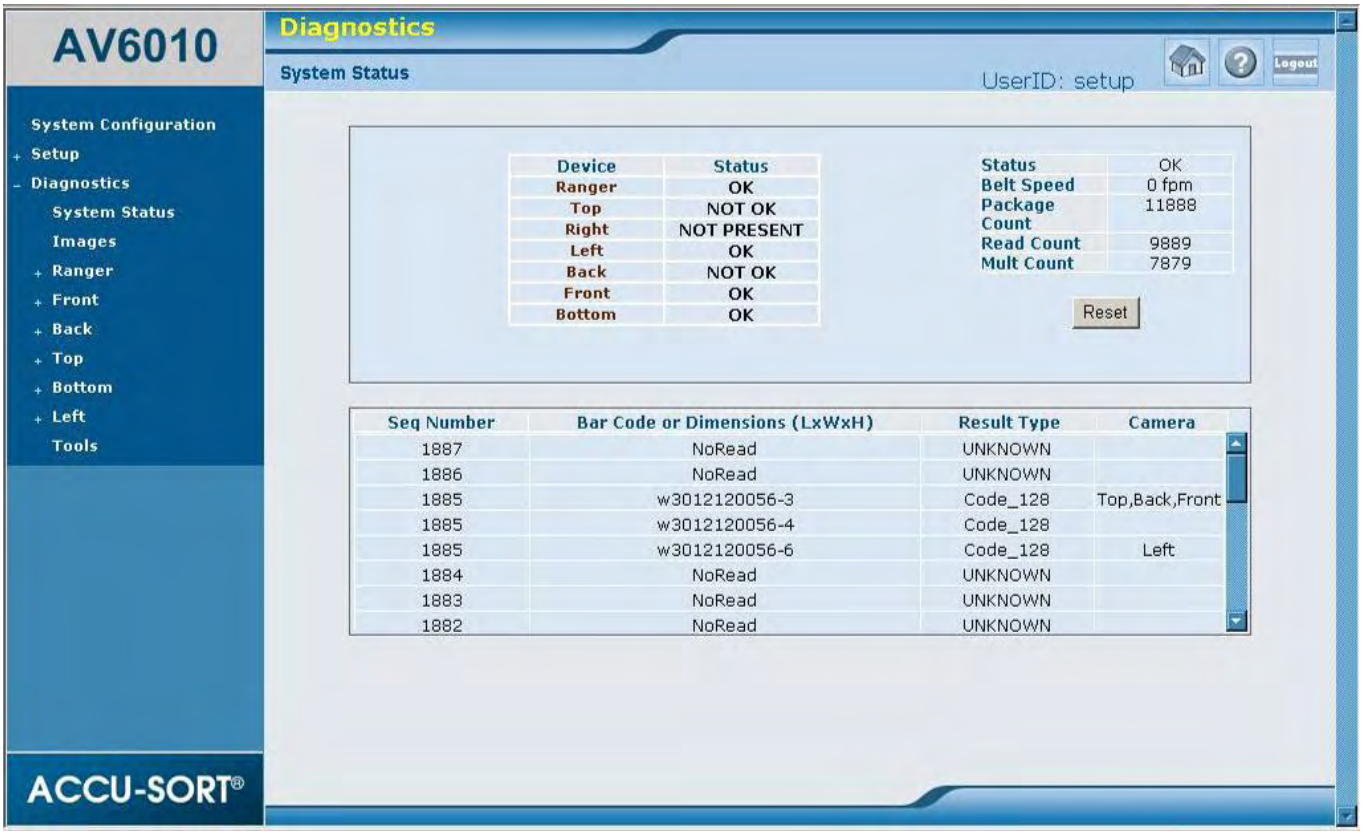
1. To start the AV6010, make sure it is connected to the power source and apply power using the power switch. In multi-camera applications, power may be controlled through the Power Distribution Box (PDB).
2. On initial power-up, the AV6010 performs an initialization sequence.
3. The **PWR** LED flashes and turns a steady green, followed by **TRIG** (green) and **TACH** (amber). At the same time, the AV6010 illumination will turn on and remain on for approximately 30 seconds, then turn off.
4. The AV6010 automatically starts all application programs required during operations.
5. After a few minutes, the illumination flashes ON then OFF.
   The entire system is ready for operation in approximately five minutes.
6. The **STAT** LED is solid green to indicate normal operation.



NOTE: All programs are automatically started when AV6010 is started or rebooted. To ensure everything is properly loaded and executed, the best way is to reboot your system.

To quickly check the operation of an AV6010 system:

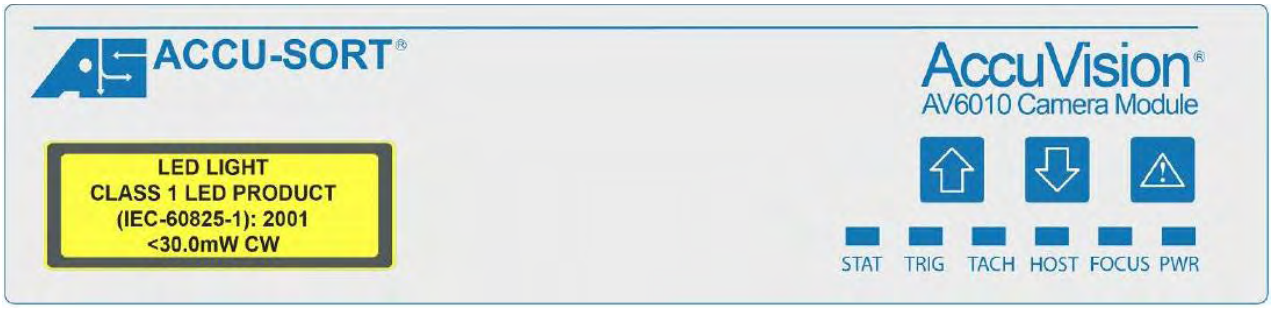
1. Confirm properly completed installation as outlined in Chapters 3 and 4.
2. Apply power to the AV6010 and follow the startup procedure.
3. Connect a computer to your camera system.
4. Use the **Monitor** user ID and password to enter the AV6010 user interface.
5. Run product through the scanning area.
6. Use **Diagnostics > System Status** to check the operation of your system.
7. Use the links in the **Device** column to individually check the RangeFinder and cameras (identified by position).



NOTE: See *Chapter 5* of the manual for details on **setup**.
Details on the **Diagnostics** are provided in *Chapter 8.*
A list of the error codes is provided in *Appendix F*.

AV6010 Camera Status Indicators

Several status indicators are located on the DCM interface panel.



Status Indicators – Normal Operations

Indicator	Description
STAT	Solid Green - System okay Solid Red - Error Blinking Red - Recoverable error (e.g., not all cameras responding)
TRIG	Indicates the camera system is receiving the TRIGGER signal. This is regardless of trigger mode (i.e., not just tied to a photoeye input). It is active when the camera is acquiring images.
TACH	Blinks when tachometer is active. Rate is sub-sampled from actual tach (every 2000 pulses).
HOST	Indicates TX and RX communications activity on HOST serial port.
FOCUS	Indicates TX and RX communications activity. (Used in Light Curtain mode.)
PWR	Power – Lights and stays lit after power-up and application startup.

NOTE: See Chapter 8 and Appendix F for details on fault conditions indicated by these LEDs.

LAN Communications Status Indicators

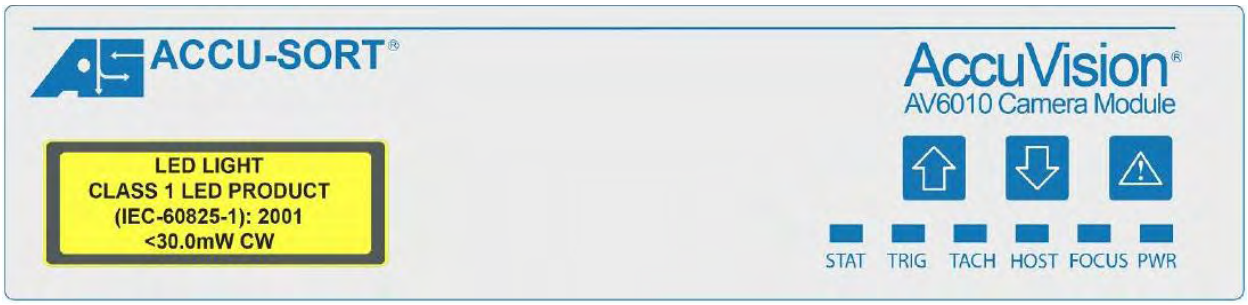
1 Gigabit

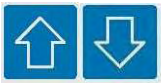
LAN LED Status Indicators (1 Gigabit)

LED	Color	LED State	Description
Left	**Green**	Off	LAN link is not established.
		On	LAN link is established.
Right	**Orange**	On	Modulates with data.

AV6010 Camera Control Panel Buttons

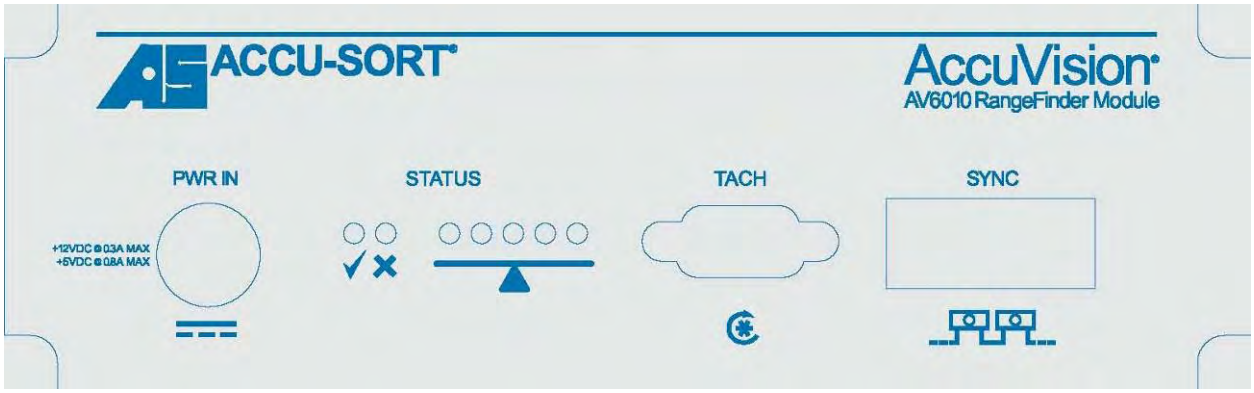
Three buttons are located on the DCM interface panel.



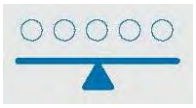
Button	Description
	Upload
	Download
	**Default** – Push and hold "Up" and "Down" buttons simultaneously. STAT LED will start blinking rapidly while the buttons are being held. When it STOPS blinking (about 5 seconds), release the buttons and the AV6010 will set its parameters to default. **IMPORTANT**: Before you default the unit, save a copy of the current XML parameters file.
	Retrieve – Press and hold for a few seconds. STAT LED will start blinking rapidly while the button is being held. When it stops blinking (about 3 seconds), release the button and the AV6010 will attempt to retrieve parameters from the other cameras.

AV6010 RangeFinder Status Indicators

Several status indicators are located on the RangeFinder interface panel.



RangeFinder Status Indicators – Normal Operations

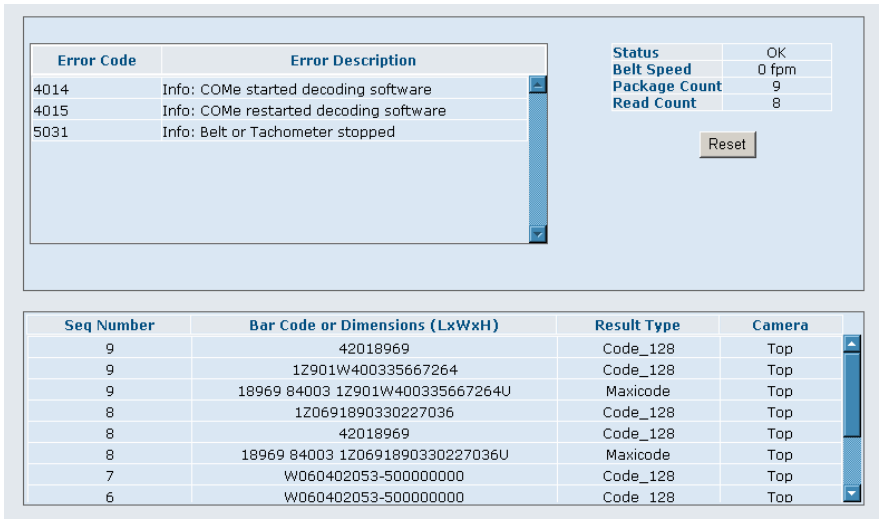
Indicator	Description
	Check Status of RangeFinder. **System Ok** *(Green LED solid 'ON')* **System Standby** *(Green LED blinking)* Standby condition indicates the conveyor has stopped or there is no tach input.
	Fault Status of RangeFinder. **Warning** *(Red LED blinking = recoverable fault)* **Error** *(Red LED solid 'ON = non-recoverable fault)*
	During normal operation (tach input with conveyor running), these LEDs will ALL illuminate when a package is present under the RangeFinder. During installation (with no tach input) these LEDs function as a leveling indicator. When the center LED is on, the RangeFinder is level.

NOTE: See Chapter 8 and Appendix F for details on fault conditions indicated by these LEDs.

Checking Operations

AV6010's browser-based interface enables you to evaluate the operational performance of your AV6010 long-range camera system by providing vital statistics via status indicators, real-time read quality monitoring, and additional information. Outgoing and incoming messages are also monitored.

Diagnostics Menu Tree of AV6010 Browser-based Application



Diagnostics > Camera Status Screen

Dimensioning Operations

During normal operations, if your AV6010 Camera System is also equipped to perform dimensioning, there are several functions that can be useful to monitor system status and check dimensioning data, including:

- Daily verification
- Viewing measurement data
- Dimensioning status
- Viewing long term storage

To verify the dimensioning system is calibrated:

It is recommended to perform dimensioning verification once per day (or once per shift). This requires a box of known dimensions and the Dimensioning Wizard. (See *Dimensioning Wizard* procedure in *Chapter 5*.)

To view measurement data:

1. Login as a **Monitor** user.
2. Go to **Diagnostics > System Status**.
3. The measurement data is shown in the scrollable part of the screen. (Reference the **Bar Code or Dimensions (LxWxH)** column.)
4. This data can also be viewed in the **Diagnostics > Camera Status** and **Diagnostics > Camera Image** screens.

To check the dimensioning status:

1. Login as a **Monitor** user.
2. Go to **Diagnostics > Top > Camera Status**.
3. Under the Error Codes, you will see one of two message:

    a. the *4026* code indicates that dimensioning is ready.

    b. *4025 Error: Dimensioning NOT Ready*, is displayed, use the '*verify dimensioning' process* to check the system.

All the system error codes are listed in *Appendix F.*

To view the Audit Trail Log:

1. Login as a **Monitor** user.
2. Go to **Diagnostics > Top > Logging**.
3. Select **Audit Trail Log** and **AATM Options**.
   Remember: Times are GMT.
4. Click **Get Updated Log File**.
5. Log file is displayed in the scrollable section of the screen.

To view the Alibi Storage Log:

6. Login as a **Monitor** user.
7. Go to **Diagnostics > Top > Logging**.
8. Select **Alibi Storage Log** and **AATM Options**.
   Remember: Times are GMT.
9. Click **Get Updated Log File**.
10. Log file is displayed in the scrollable section of the screen.

Side-by-Side Package Detection Operations

Once the system is properly configured for SBS package detection, it can be monitored from the **Diagnostics > System Monitor**.

Seasonal changes in product flow may require calibration of additional SBS conditions. See the procedures in *Chapter 5* for details on capturing images and evaluating/optimizing new SBS conditions using the **Camera Image Viewer**.

See also: Setup > Options > Side-by-Side and Camera Image Viewer in Appendix B.

Notes:

7 Maintenance

This chapter provides instructions for maintaining optimum performance and life for your AV6010 Long-Range Camera System. It provides specific information on:

- Maintenance Procedures
- Exterior Cleaning
- Mounting Hardware Checks
- Wiring Connection Checks

Maintenance Tools and Materials Needed

Item	Description
Soft-bristle brush	For removing accumulated dust/dirt from the camera's exterior
Clean soft cloths	For more detailed cleaning of the camera's exterior (used in combination with mild detergent cleaning solution)
Cleaning solutions	Mild detergent solution for cleaning the camera's exterior.
	70% denatured alcohol, 30% de-ionized water solution for cleaning the camera's illumination exit window
Soft cotton swabs or lint-free cloth	Use to clean camera's illumination exit window

Recommended Maintenance Frequency

The AV6010 Long-Range Camera System is designed for industrial environments. The recommended frequency for performing these maintenance tasks will depend on the application's environment. In general, these procedures are recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the equipment or when performance is degraded by accumulation of dust or dirt on the exit windows or mirrors. By monitoring normal operations and performing weekly visual checks, you can establish a maintenance schedule that fits your application.

Maintenance Tasks

Perform the maintenance tasks on an “as needed” basis to assure proper operation of the camera.

Task schedule frequency depends upon the application environment conditions. Harsh environments that expose the equipment to more heat, dust, and dirt will require these procedures be performed more frequently.

It only requires a few minutes to complete each maintenance task.

Exterior Cleaning

WARNING: Shut down the AV6010 Camera System before performing this maintenance task.

CAUTION: Do not use any chemical on the camera that is unsafe for plastics, such as benzene, acetone, or similar products. Do not use compressed air because it usually contains oil or water.

The exterior cleaning procedure may be performed without removing the device from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Clean the exterior with a clean, soft-bristle brush.
4. Carefully remove any dirt or debris in or around the connector panel and cooling fans.
5. Wipe the exterior with a clean, soft cloth dampened slightly with a mild detergent solution.

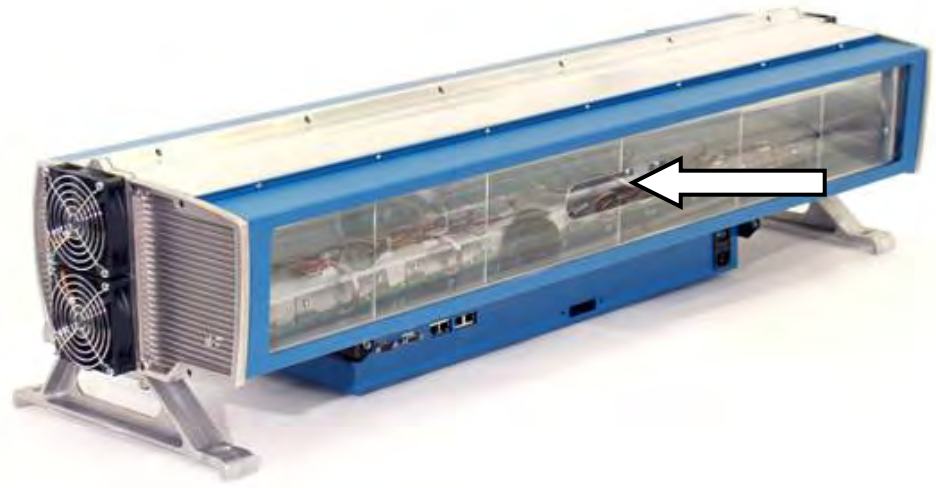
Cleaning the Camera Window

WARNING: Shut down the camera system before performing this maintenance task. Do not stare into the camera's window at the LED light. Avoid direct eye exposure. The LED light level does not constitute a health hazard, however staring at the LED light for prolonged periods could result in eye damage.

CAUTION: Never apply cleaning solution directly to the camera window. Always apply the solution to a cloth, and then the cloth to the window. Do not use any chemical on the camera that is unsafe for plastics, such as benzene, acetone, or similar products.

This procedure is recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the folding mirrors. The exit window cleaning procedure should be performed without removing the camera from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Follow the exterior cleaning procedure before cleaning the exit window.
4. Check the exit window surface for any dust, dirt, or smudges. If the window needs to be cleaned, proceed to Step 5.
5. Make a solution of seven parts denatured alcohol and three parts water. (Many over-the-counter solutions will leave deposits/smudges that can affect performance.)
6. Apply the cleaning solution to a lint-free cotton cloth.
7. Apply the cloth with cleaning solution to the exit window.
8. Remove any streaks or remaining moisture from the exit window with a dry, soft, lint-free cloth or lens paper.
9. Verify camera operation. Follow the Operations Checklist procedure in Chapter 6.



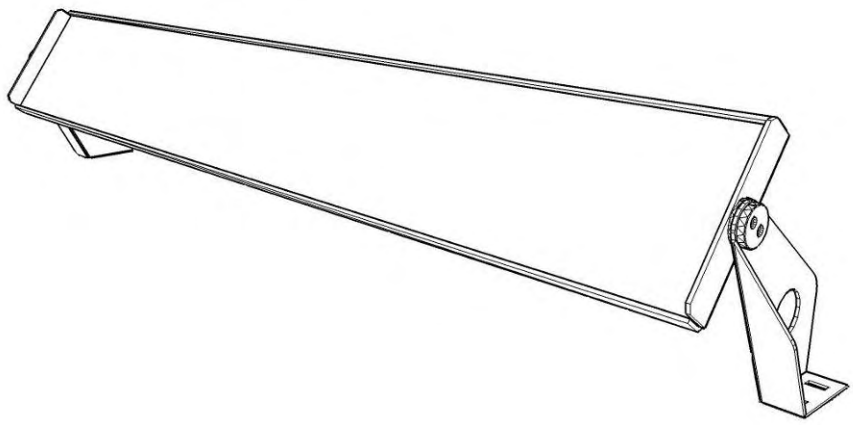
Cleaning the Folding Mirror

WARNING: Shut down the camera system before performing this maintenance task. Do not stare into the camera's window at the LED light. Avoid direct eye exposure. The LED light level does not constitute a health hazard, however staring at the LED light for prolonged periods could result in eye damage.

CAUTION: Use care when cleaning the mirror to assure that the alignment with the camera is not altered. Never apply cleaning solution directly to the mirror. Always apply the solution to a cloth, and then the cloth to the mirror. It is a good habit to pre-mark the mirror position, so if it does move it can be returned to the original position.

This procedure is recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the folding mirrors. The cleaning procedure should be performed without removing the mirror from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Review the exterior cleaning procedure before cleaning the folding mirror.
4. Check the folding mirror for any dust, dirt, or smudges.
   If the mirror needs to be cleaned, proceed to Step 5.
5. Use a dry, soft, lint-free cloth to remove accumulated dust.
6. If the mirror is particularly dirty or smudged, make a solution of seven parts denatured alcohol and three parts water. (Many over-the-counter solutions will leave deposits/smudges that can affect performance.)
7. Apply the cleaning solution to a lint-free cloth.
8. Apply the cloth with the cleaning solution to the folding mirror.
9. Remove any streaks or remaining moisture from the folding mirror with a dry, soft, lint-free cloth or lens paper.
10. Verify camera operation. Follow the Operations Checklist procedure in Chapter 6.



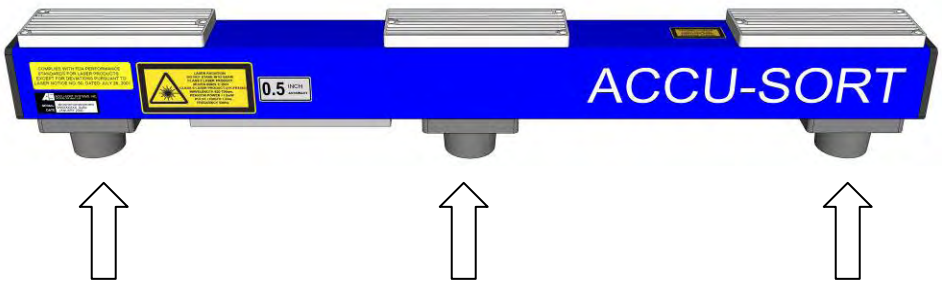
Cleaning the RangeFinder Windows

WARNING: Shut down the camera system before performing this maintenance task. Do not stare into the RangeFinder's laser exit windows. Avoid direct eye exposure. The laser light level does not constitute a health hazard, however staring at the laser light for prolonged periods could result in eye damage.

CAUTION: Use care when cleaning the RangeFinder to assure the windows are not scratched or damaged in any way. Never apply cleaning solution directly to the windows. Always apply the solution to a cloth, and then the cloth to the windows.

This procedure is recommended only if it is noticed that the environment is dirty enough that deposits are appearing on the RangeFinder windows. The cleaning procedure should be performed without removing the RangeFinder from the mounting structure.

1. Switch off the conveyor.
2. Switch off the camera system.
3. Review the exterior cleaning procedure before cleaning the three windows.
4. Check the windows for any dust, dirt, or smudges. If the window needs to be cleaned, proceed to Step 5.
5. Use a dry, soft, lint-free cloth to remove accumulated dust.
6. If the windows are particularly dirty or smudged, make a solution of seven parts denatured alcohol and three parts water. (Many over-the-counter solutions will leave deposits/smudges that can affect performance.)
7. Apply the cleaning solution to a cotton swab or lint-free cloth.
8. Apply the cleaning solution to the windows.
9. Remove any streaks or remaining moisture with a dry, soft, lint-free cloth or lens paper.
10. Verify RangeFinder operation. Follow the Operations Checklist procedure in Chapter 6.



Tighten Mounting Hardware

The front-loading mounting hardware used to assemble the mounting structure and mount the equipment should not become lose if properly tightened. This is a safety check recommended for harsh environments where vibration may be a problem.

1. Check all structure, camera, mirror and RangeFinder mounting hardware. Tighten as necessary. Do not over-tighten. Be sure not to disturb the alignment of the RangeFinder or any mirrors also mounted to the same structure.
2. Check the mounting hardware of other devices. Tighten as necessary. Do not over-tighten.

Checking Connections

All wiring connections to the AV6010 Camera(s) and RangeFinder are made through the connector panels. This is a safety check recommended for harsh environments where vibration may be a problem. *(Reference Chapter 4, Electrical Installation.)*

1. Check all wiring connections to the camera. Tighten as necessary. Do not over-tighten.
2. Check all cabling for signs of wear/damage. Repair/replace any damaged cable connections as necessary.
3. Check all cabling used with optional devices (e.g, monitor, keyboard, etc.) to assure they will function properly when they are needed.

Verify Operation

Follow the procedure defined in Chapter 6, Operations Checklist.

8 Troubleshooting

This chapter provides instructions for diagnosing, troubleshooting and correcting AV6010 performance issues. It provides specific information on:

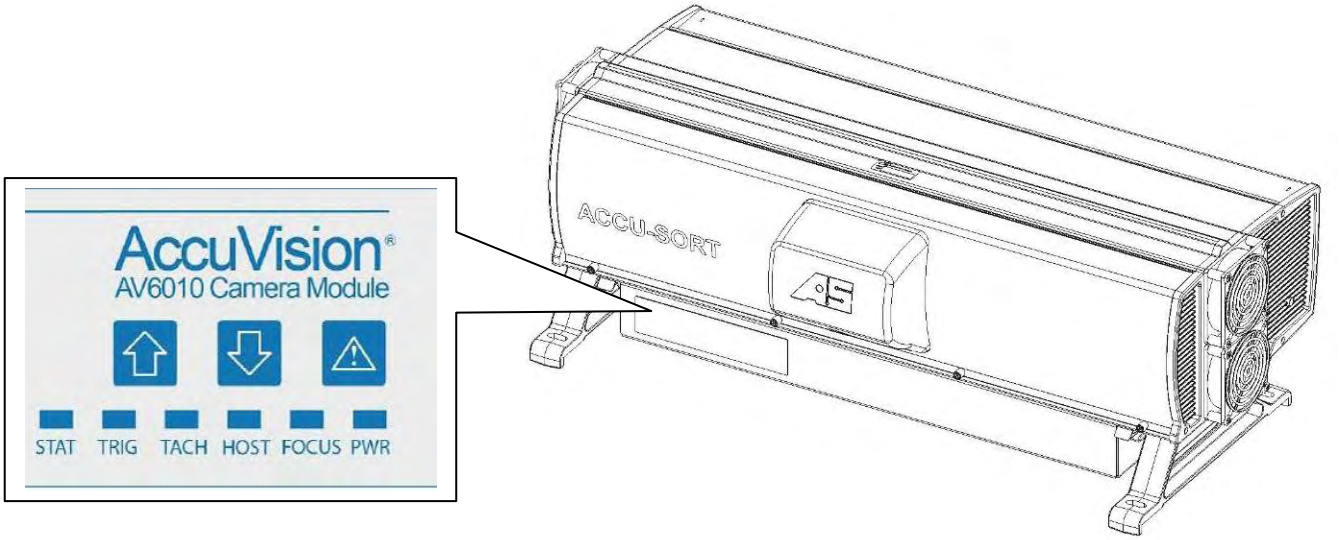
- Status Indicators
- Diagnostics
- Troubleshooting (Problem/Cause/Solution)

Reference the content of this chapter for details on the diagnostics, tools and logs available for the system including:

- System Monitor
- RangeFinder Monitor
- Camera Monitor (one per camera in system)
- Tools – View/Load Parameter File, Downloads, Set Passwords, Update Software
- Logs – Error, Debug, Audit Trail, Alibi Storage

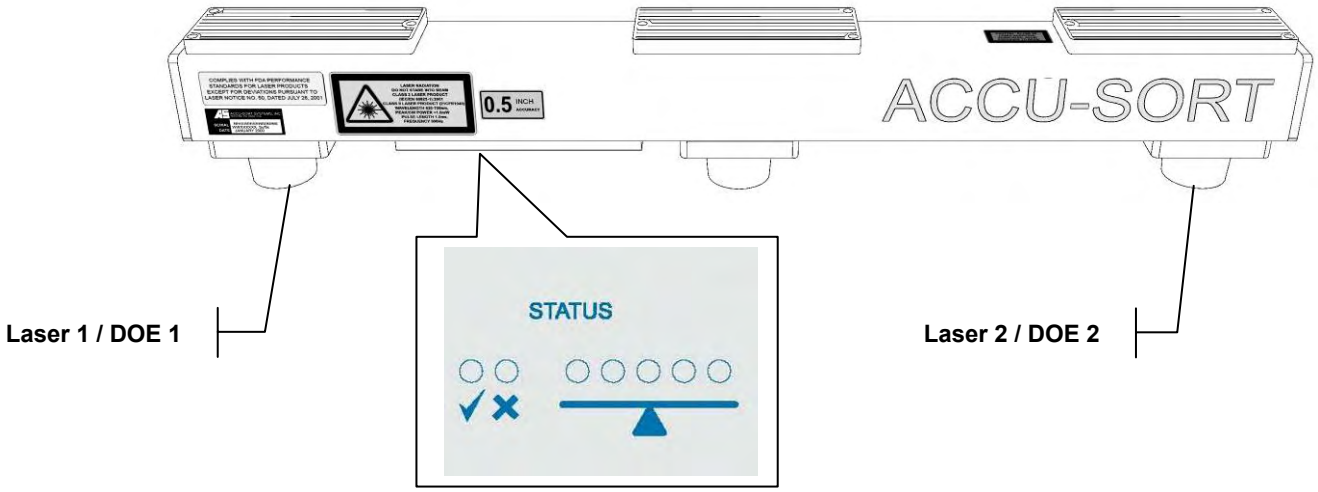
CAUTION: Because of the complexity of the AccuVision AV6010 Long-Range Camera System, it is recommended that training from Accu-Sort be considered before attempting to diagnose problems without the assistance of Accu-Sort technical support. As part of the troubleshooting and FRU replacement training, technicians receive additional information including the ***AV6010 Troubleshooting Matrix***.

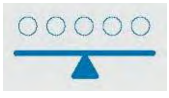
Camera Status Indicators: Fault Detection



LED	Description
STAT	Status of camera system. *(See Error Codes, Appendix F.)* ▪ Warning *(Status Red LED blinking, recoverable error)* ▪ Error *(Status Red LED solid 'ON')*
TRIG	Trigger – No LED activity means system is not being triggered.
TACH	Tachometer – LED not blinking means the tachometer is not active. If the conveyor is running, the tach is either improperly connected or the tach has failed.
HOST	Host Serial Communications (TX and RX activity) No LED activity means there is no data communications.
FOCUS	Focus Serial Communications (TX and RX activity) No LED activity means there is no data communications.
PWR	Power for Camera If this LED is not lit, check: 1. Is power switch in the "on" position? 2. Is the camera properly connected to the power source? 3. Is power being supplied from the power source? 4. Possible power supply failure.

RangeFinder Status Indicators: Fault Detection



LED	Description
	Status of RangeFinder. *(See Error Codes, Appendix F.)* ▪ Info *(Green LED blinking)*
	Status of RangeFinder. *(See Error Codes, Appendix F.)* ▪ Warning *(Red LED blinking)* ▪ Error *(Red LED solid 'ON')* When facing the RangeFinder (with the ACCU-SORT silk-screen to the right): ▪ Laser 1 / DOE 1 *(Right)* *(Left-side of conveyor)* ▪ Laser 2 / DOE 2 *(Left)* *(Right-side of conveyor)*
	During operations (tach input present / conveyor on), these LEDs should ALL light when a package is under the RangeFinder. If they do not light during the presence of a package, troubleshoot the RangeFinder. During installation (no tach input / conveyor off), this is a level indicator. Any LED that is lit other than the center LED indicates the RangeFinder is NOT level. Leveling procedure is provided in *Chapter 5.*

Diagnostics

A skilled technician can also use the AV6010 user interface application to perform specific diagnostics functions.

Use the **Diagnostics** available from the user interface to check the following:

- System Status
- Images
- RangeFinder Status
- Camera Status
- Tools

A list of the error codes mentioned on the status screen is provided in *Appendix F*.

System Status

Use the System Status screen to view diagnostics information on the entire AV6010 camera system. Every device connected to the SYNC network appears on this monitor screen. Under the Device column, there are clickable links that open a status page specific to the device.

Images

Use the Images screen to view the images from each camera in the system. For example, if your AV6010 application uses three cameras to read the top and sides of products, three image thumbnails will be displayed on this screen.

NOTE: To view individual camera images, go to the **Diagnostics > (Camera Position) > Image** screen for the AV6010 you wish to monitor.

RangeFinder Status

Use the RangeFinder Status screen to view diagnostics information related specifically to RangeFinder operations. This information will identify such things as the box index number, height, and left/right position on the conveyor.

Camera Status

Use the Camera Status screen to view diagnostics information related specifically to a single camera's operations including the box index number and the bar codes that were read by the camera.

In multiple-camera systems, there is a camera status screen for every camera connected to the SYNC network.

Diagnostics Tools

View/Load Parameter File

NOTE: After completing system setup, it is recommended that a copy of the XML parameters file be saved for future reference. This is especially useful for single camera installations.

o

To view and save the parameter file of the camera:

1. Login to the AV6010 user interface as a Setup user.
2. Select **Diagnostics > Tools** in the menu tree.
3. In the **View/Load Parameter Files** section of the screen, click **View Parameters Files**.
4. The camera system's XML file is displayed in a new window.
   In a multi-camera system, this XML file contains all of the parameters for the RangeFinder and ALL cameras in the system. They can be easily viewed by scrolling up and down, as needed.
5. To save the XML file to your computer, use **File > Save As**.
   The original file is automatically named **leapfrog_configuration.xml**.
   The file can be renamed, if needed. For example: In applications where multiple systems are used, you could name the file to identify the location (e.g., Tunnel1_configuration.xml, Tunnel2_configuration.xml, etc.).

To load a parameter file to a camera:

CAUTION: Loading a parameter file to a camera will result in the camera using the most recently loaded file. Be certain the file you load is the file you want to use and that you have a backup copy of the previously used parameter file in case you need to return to using it.

1. Login to the AV6010 user interface as a Setup user.
2. Select **Diagnostics > Tools** in the menu tree.
3. In the **View/Load Parameter Files** section of the screen, click **Browse.**
4. Locate the ***_configuration.xml** file that you wish to load to the system.
5. Click on the file name and then click **Open**.
6. Click **Load Parameter File**.
7. Once the file is loaded, a small dialog box indicates '*File successfully loaded'.*
8. There is no need to restart. The system automatically uses the most recently loaded parameter file.

Downloads

To download the AV6010 Install Wizard:

1. Login to the AV6010 user interface.
2. Select **Diagnostics > Tools** in the menu tree.
3. Click **InstallWizard.zip** in the Downloads section.
4. In the **File Download** dialog box, click **Save**.
5. Browse to where you want to save the ZIP file and click **Save**.
6. Click **Close** when **Download Complete** appears.
7. Locate and open the InstallWizard.zip file.
8. Double-click the **AV6010Setup_1.1.3.msi** file.
   (This filename may be different depending on the version on your system.)
9. Follow the instructions of the **AV6010 Calibration Software Setup Wizard** to complete the installation. If a version of the Install Wizard has already been installed, you'll be given the choice to **Repair** or **Remove**.
10. Once completed successfully, the **AV6010 Install Wizard** icon appears on your computer desktop.

(For more information, see AV6010 Install Wizard in Chapter 5, Setup.)

To download and print the Camera Scan Line Target:

Note: This is used with the Camera Install Wizards.

1. Login to the AV6010 user interface.
2. Select **Diagnostics > Tools** in the menu tree.
3. Click **CameraScanLineTarget.pdf**. The PDF opens in a new window.
4. To save a copy to your computer, use **File > Save As**.
5. When printing the camera scan line target, make sure you set the scaling (page scaling) to **None**.

(For more information, see AV6010 Install Wizard in Chapter 5, Setup.)

To download and print the Static Focus Target:

Note: This is used with the Camera Install Wizards.

1. Login to the AV6010 user interface.
2. Select **Diagnostics > Tools** in the menu tree.
3. Click **StaticFocusTarget.pdf**. The PDF opens in a new window.
4. To save a copy to your computer, use **File > Save As**.
5. When printing the static focus target, make sure you set the scaling (page scaling) to **None**.

(For more information, see AV6010 Install Wizard in Chapter 5, Setup.)

To download the Image Viewer:

1. Login to the AV6010 user interface.
2. Select **Diagnostics > Tools** in the menu tree.
3. Click **ImageViewer.zip**.
4. In the **File Download** dialog box, click **Save**.
5. Browse to where you want to save the ZIP file and click **Save**.
6. Click **Close** when **Download Complete** appears.
7. Locate and open the ImageViewer.zip file.
8. Double-click the **AV6010_Realtime_Viewer.exe** file to open the Image Viewer window.

(For more information, see Image Viewer later in this chapter.)

To download and print the Dynamic Focus Target:

Note: This is used with the Camera Image Viewer.

1. Login to the AV6010 user interface.
2. Select **Diagnostics > Tools** in the menu tree.
3. Click **DynamicFocusTarget.pdf**. The PDF opens in a new window.
4. To save a copy to your computer, use **File > Save As**.
5. When printing the dynamic focus target, make sure you set the scaling (page scaling) to **None**.

(For more information, see Dynamic Focus Calibration in Chapter 5, Setup.)

To download the Diagnostics Tools:

1. Click **DiagTools.zip**.
2. In the **File Download** dialog box, click **Save**.
3. Browse to where you want to save the ZIP file and click **Save**.
4. Click **Close** when **Download Complete** appears.
5. Locate and open the **DiagTools.zip** file.
6. Save the files from the zip folder so that you can locate the tools later when you need them. There are three tools:
   - Camera Image Viewer *(Camera OScope)*
   - Codeword Viewer
   - Ranger OScope
7. Double-click any of the ***.exe** files to open any of the tools.

(For more information on the Diagnostics Tools, see the details provided later in this chapter.)

Set Passwords

To set new passwords:

1. Login to the AV6010 user interface.
2. Select **Diagnostics > Tools** in the menu tree.
3. Under the **Set Passwords** section of the screen, enter a new **Setup Password** and **Monitor Password**.
4. Click **Set Passwords**. The new passwords will be required at the next login.

Update Software

IMPORTANT: This procedure is for all camera systems using software version 4.x or greater. If you need to download and older version of software, contact Accu-Sort Technical Support at 1-800-BAR-CODE.

Software installation will take a few minutes. During installation, the camera's STAT LED cycles through red, green, and amber and then off. Do NOT reboot or remove power from the camera. When installation is complete, the camera will reboot automatically.

To load the complete software image:

1. Login to the AV6010 user interface.
2. Select **Diagnostics > Tools** in the menu tree.
3. Under the **Update Software** section of the screen, click **Load Image**. (Accept the certificate, if prompted to do so.)
4. In the Software Upload Utility, click **Select File**.
5. Select the new AV6010 image file to upload (e.g., leapfrog_cflash.tar.gz). The file is sent (FTP) to the camera. A progress bar is displayed during the upload.
6. The camera reboots automatically when the update is complete.

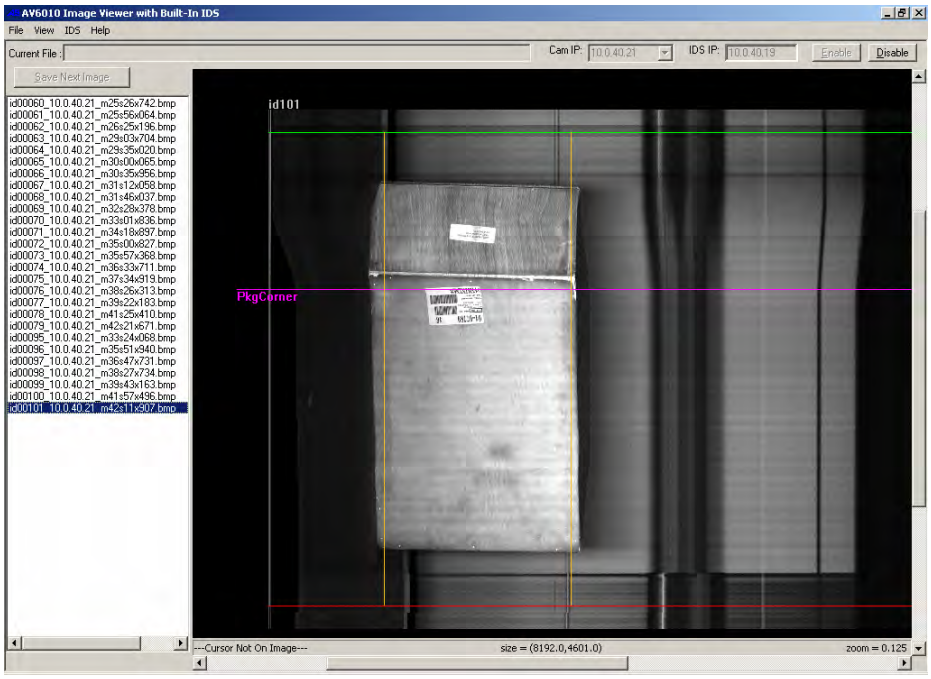
To load a software update patch:

1. Login to the AV6010 user interface.
2. Select **Diagnostics > Tools** in the menu tree.
3. Under the **Update Software** section of the screen, click **Load Patch**. (Accept the certificate, if prompted to do so.)
4. In the Software Upload Utility, click **Select File**.
5. Select the patch file to upload (e.g., leapfrog_update.tar.gz). The file is sent (FTP) to the camera. A progress bar is displayed during the upload.
6. The camera reboots automatically when the update is complete.

AV6010 Image Viewer

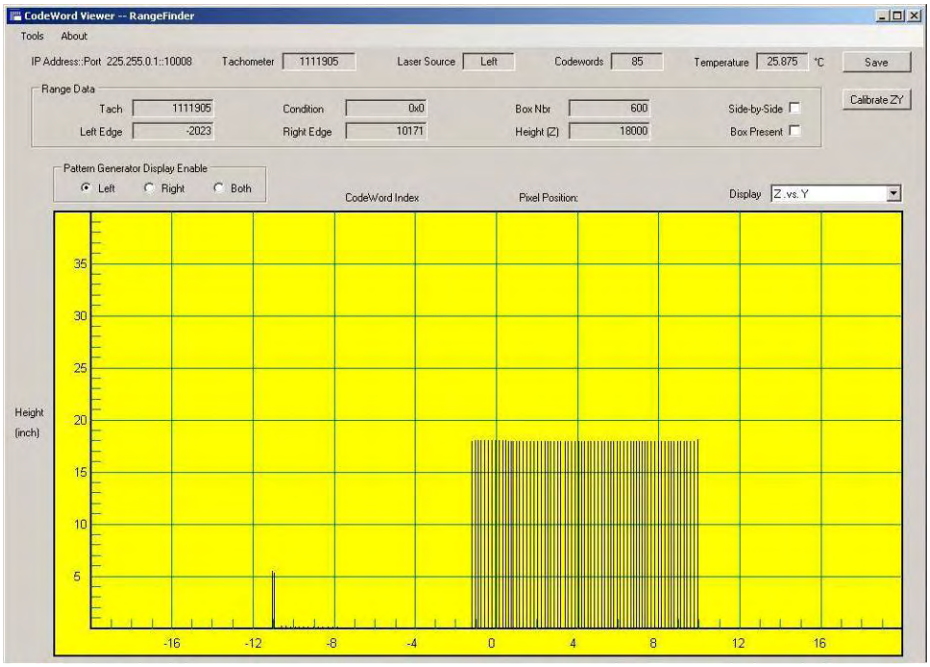
The AV6010 Image Viewer is a real-time application tool for viewing the camera sensor data. (Remember, AV6010 uses a high-speed linear sensor, it does not 'take a picture' like a typical camera.) This tool allows you to view what the sensor is currently seeing. It also displays any embedded data for diagnostic and set up purposes.

CAUTION: The AV6010 Image Viewer is for setup and diagnostic purposes only. It should not be allowed to remain running while a camera system is under normal operating conditions as it changes the line rate and turns on the illumination to capture the sensor data.



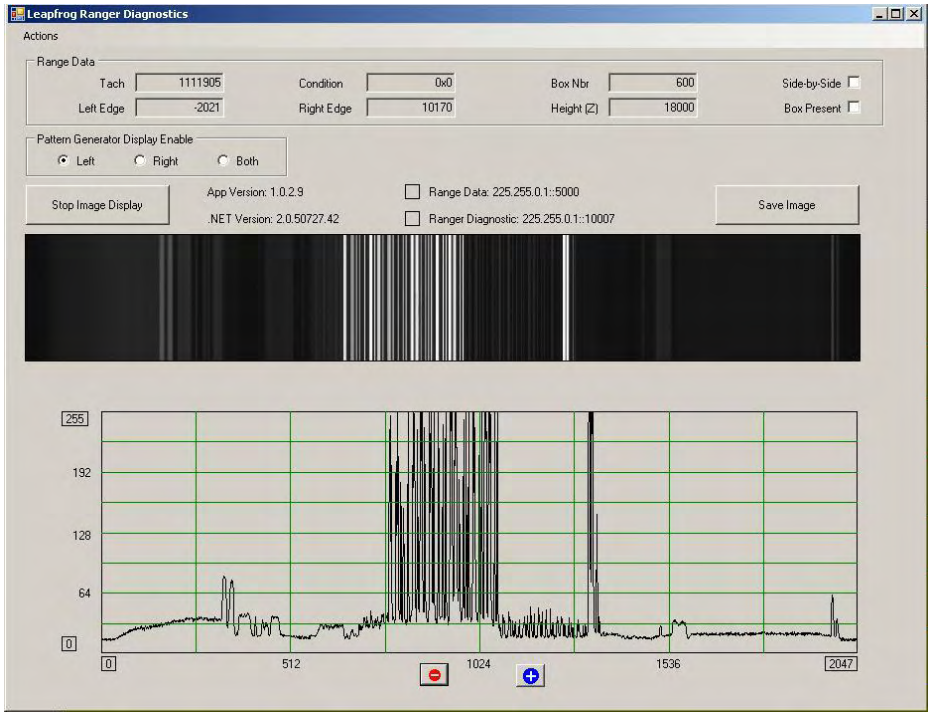
NOTE: The AV6010 Image Viewer is not an image storage application. If image storage and retrieval are needed, the VisionCapture/IDS (Image Depot Server) System is an option available from Accu-Sort.

RangeFinder Codewords Viewer



[Details not available at time of publication.]

RangerFinder O-Scope



[Details not available at time of publication.]

Troubleshooting

The PCS (problem/cause/solution) tables assist you in troubleshooting the more common events that may occur during operation. There are several error codes that are displayed in the **Diagnostics > Status** screens that can be used to determine possible problems.

These tables provide examples of using the error codes listed in *Appendix F* for PCS troubleshooting. Technicians that complete the AV6010 troubleshooting and field replaceable unit (FRU) replacement training program should also reference the ***AV6010 Troubleshooting Matrix***.

Reference *Chapter 9* for the location of FRUs. A guide is sent with every FRU to make component replacement easy.

Error Code	Problem	Cause(s)	Solution(s)
Cannot establish connection to camera / user interface			
--	**During initial setup, after connecting to the camera SYNC, IP address 192.168.0.50 not shown. User interface Log In not displayed.**	TACH may not be properly connected. (POWER LED lit, STATUS LED not lit.)	Confirm the TACH cable is properly connected. If the TACH connection was wired on site, confirm against drawing 111515 in Appendix H.
Cooling Fan Failures			
3047	**Error: Right side fan disconnected or failed**	Confirm connection of fan module to transition board.	If connected but not running, replace right-hand fan module.
3048	**Error: Left side fan disconnected or failed**	Confirm connection of fan module to transition board.	If connected but not running, replace left-hand fan module.
LED Board Failure			
5016	**Error: Failure of LED Board 1**	Check LED Board. If all other LED board are lit, LED Board 1 has failed.	Replace LED Board 1.
Tachometer Failure			
5031	**Belt or tachometer stopped**	If belt is running when this error code is present, check tach operations. Possible tach failure.	Replace tachometer.
Laser Failure in RangeFinder			
6032	**Laser 1 is off or blocked (no codewords)**	Check Laser 1. If Laser 1 is off and Laser 2 is on, RangeFinder failure.	Replace RangeFinder.
6033	**Laser 2 is off or blocked (no codewords)**	Check Laser 2. If Laser 2 is off and Laser 1 is on, RangeFinder failure.	Replace RangeFinder.

Notes:

9 Service

The AV6010 Camera System incorporates a number of field-replaceable units (FRUs) in order to minimize downtime. In most cases, components should be replaced with a matching recommended spare part (RSP).

Service procedures are divided into two skill levels:

- Customer technicians (with some training from Accu-Sort)
- Accu-Sort Trained and Authorized Service Technicians only

All AV6010 Camera accessories and options are considered customer technician field-replaceable units (FRUs).

Replacement Procedures

CAUTION: This symbol indicates you are about to perform an action involving, either a dangerous level of voltage, or to warn against an action that could result in damage to devices or electrical shock. Please follow necessary procedures as outlined in *Chapter 2, Safety*.

ESD CAUTION: This symbol identifies a procedure that requires you take measures to prevent Electrostatic Discharge (ESD) e.g., use an ESD wrist strap. Circuit boards are most at risk. Please follow ESD procedures as outlined in *Chapter 2, Safety*.

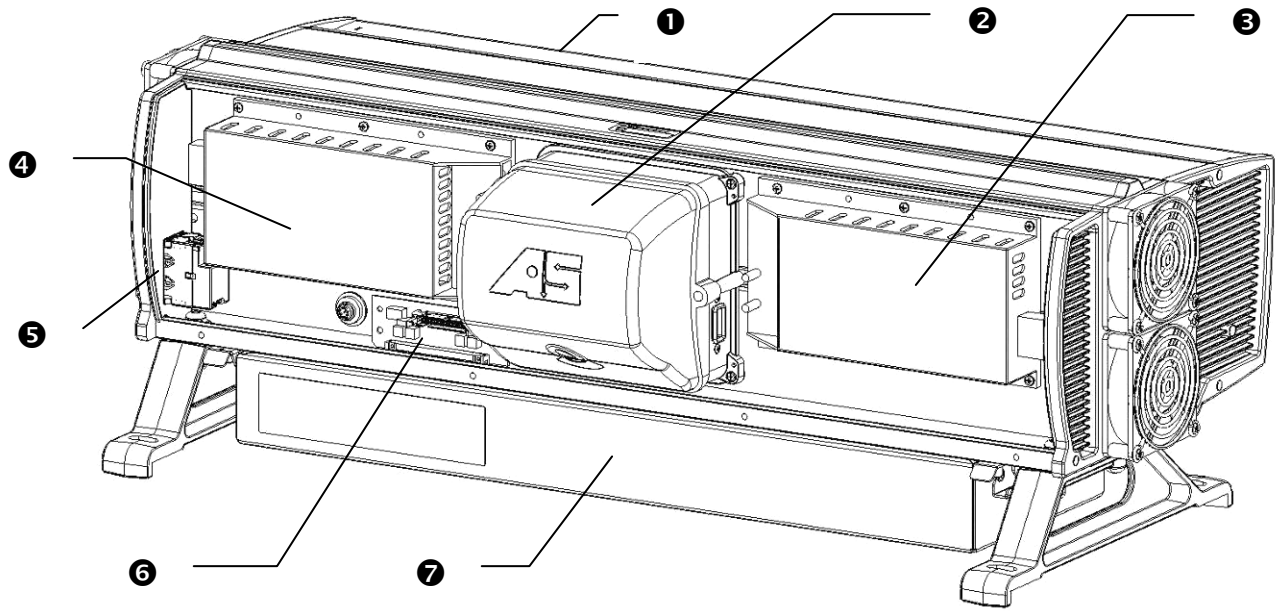
External Devices

To replace any external devices, reference the installation procedures provided in Chapter 3 and Chapter 4.

Field Replaceable Units (FRUs)

Replacement procedures for internal field-replaceable units (FRUs) that may be performed by customer technicians are provided with the replacement part.

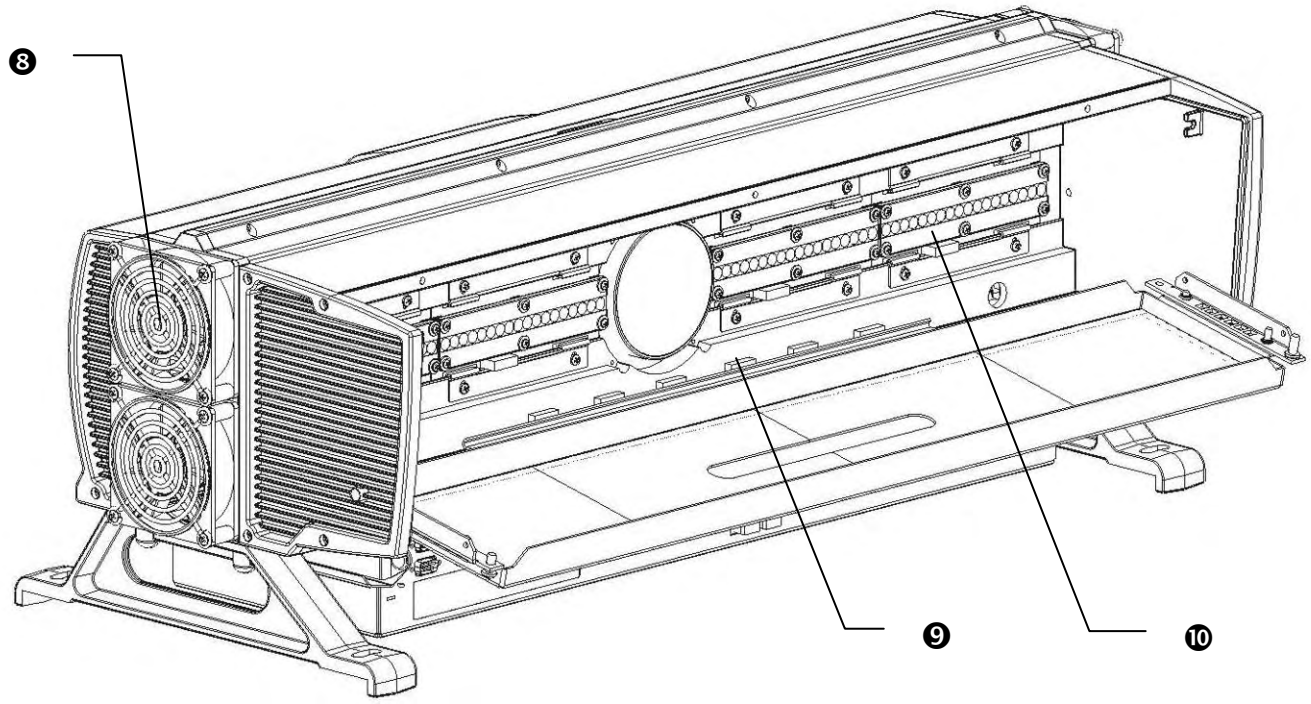
CAUTION: Although someone with basic electromechanical / technical skills may perform the removal and replacement of the field replaceable units (FRUs), Accu-Sort training is recommended, especially where the AV6010 is used in certified dimensioning applications. Contact Customer Service at 1-800-BAR-CODE to schedule training that fits your needs.



AV6010 Camera Module (Camera Head Side)

	FRU Guide	Spare Part #	Replacement Part Descriptions		# of Cameras on Site ►	Spares Recommended 1-10	11-30	31-50
❶	1000065769	1000065953	AV6010 Exit Window	Short Illumination 30” [762.0 mm] model				
		1000065954	AV6010 Exit Window	Long Illumination 42” [1066.8 mm] model				
❷	1000065770	1000065956	Camera Head Module	69 MM, F/5.6			1	2
		1000068821	Camera Head Module	69 MM, F/8.0			1	2
		1000065957	Camera Head Module	90 MM, F/5.6			1	2
		1000065958	Camera Head Module	110 MM, F/5.6			1	2
		1000068228	Camera Head Module	110 MM, F/5.6 (short range)			1	2
		1000065959	Camera Head Module	140 MM, F/4.0			1	2
❸	1000065773	1000065964	Power Supply	28 VDC, for Illumination		1	1	1
❹	1000065776	1000065962	Power Supply	12 VDC, for DCM / Camera Head		1	1	1
❺	1000065780	1000065969	Fuse			5	5	5
❻	1000065981	1000065989	Transition Board					
❼	1000065779	1000068420	Distributed Computing Module (COM-e 1)	DCM with Decoding		1	1	2
		1000069022	Distributed Computing Module (COM-e 1)	DCM with Decoding		1	1	2
		1000068422	Distributed Computing Module (COM-e 1 & 2)	Decoding and Dimensioning		1	1	2

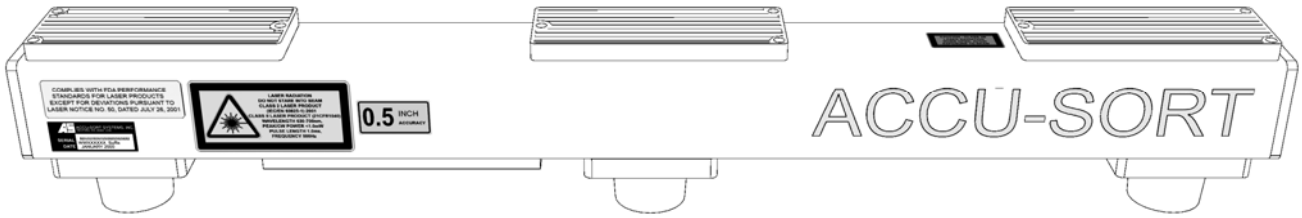
NOTE: Other DCM FRUs are available that include the COM-e 3 module typically used for Raw Image Export (RIE) or PCI cards. These are customer-specific FRUs. The FRU part numbers for custom DCMs must be requested from your Accu-Sort Sales Representative or Customer Service.



AV6010 Camera Module (Exit Window Side)

	FRU Guide	Spare Part #	Replacement Part Descriptions		# of Cameras on Site ►	Spares Recommended 1-10	11-30	31-50
❽	1000065778	1000065965	Cooling Fan	Left Module (with power switch)		1	1	2
		1000065966	Cooling Fan	Right Module		1	1	2
❾	1000065771	1000065960	Illumination Control Board	Used in both 30 and 42-inch models		1	1	1
❿	1000065772	1000065961	LED Illumination Board	Short (use with 110 and 140mm lens)				
		1000065968	LED Illumination Board	Tall (use with 50, 69 and 90mm lens)				

NOTE: The ***AV6010 FRU Guides*** and "how to" videos are available.



AV6010 RangeFinder Module

FRU Guide	Spare Part #	Replacement Part Descriptions		# of RangeFinders on Site ►	Spares Recommended 1-10	11-20	21-30
1000065774	1000065963	Power Supply	For RangeFinder		1	2	3
1000065775	1000068394	RangeFinder	0.1” Accuracy for Dimensioning		1	2	3
	1000068395	RangeFinder	0.2” [5mm/10mm] Accuracy for Dimensioning		1	2	3
	1000068396	RangeFinder	0.5” [20 mm] Accuracy for Dimensioning		1	2	3
	1000068832	RangeFinder	OIML Certified 5mm/10mm Accuracy for Dimensioning		1	2	3

NOTE: Mounting brackets / power supply not included with RangeFinder FRUs.

RangeFinders include an accuracy label to the right-side of the laser caution label. Be sure to match the RangeFinder accuracy for your application.

A Specifications

AV6010 Camera System Technical Specifications

Characteristic	Description
Name	AccuVision® AV6010 Long Range Camera System
Resolution	250 DPI
Transport Speed (max.)	Belt: 620 FPM [3.2 MPS]
Size: Camera (w/Short Illum)	H 11.15" [283 mm] x W 32.75" [832 mm] x L 15.31" [389 mm]
Camera (w/Long Illum)	H 11.15" [283 mm] x W 44.75" [1137 mm] x L 15.31" [389 mm]
RangeFinder	H 5.42" [138 mm] x W 3.25" [83 mm] x L 36.0" [915 mm]
Weight	Camera - Short Illum: 68.08 lbs [30.8 kg] Long Illum 81.79 [37.1 kg] RangeFinder: 18.0 lbs [8.2 kg]
Enclosure	Camera: Rigid cast aluminum chassis with powder-coated aluminum access covers RangeFinder: Powder-coated extruded aluminum
Temperature	Operating: +32° to +122° F [0° to +50° C] Storage: -4° to +158° F [-20° to +70° C]
Relative Humidity	10% - 90% non-condensing
Illumination (Light Source)	Camera: High intensity red LEDs (635 nm)
	RangeFinder: Two visible red lasers (650 nm)
Power Requirements	115/230 VAC, 50/60 Hz, 85-110%
Power Consumption	450 VA max. for standard configuration; 800 VA max. with all options
Visual Indicators (6 LEDs)	Camera: STAT, TRIG, TACH, HOST, L/C, PWR RangeFinder: 7 status LEDs
Bar Code Types	All standard 1D and 2D symbologies
Connections	Gigabit Ethernet TCP/IP (RJ45), Serial RS232/422 (9-pin 'D')
Distributed Computing Module	LynxOS on main processor, Linux OS on up to 3 Com Express modules
Options	Dimensioning, Raw Image Export (RIE) for OCR, Monitor and Keyboard with trackball VisionCapture (Image Depot Server / IDS), FAST Monitor
Vibration Limit	Camera and RangeFinder: 2G (10-500 Hz continuous) maximum
Reliability	> 75,000 hours MTBF @ 50° C
Service Options	Installation assistance and on-site training
Warranty	1-year limited, parts and labor; available Blue Ribbon Extended Service (BRES)
Compliances	UL, cUL, CE, FCC (Class A), IEC-60825-1, 21CFR1040 Certified Dimensioning Approvals: NCWM/NTEP, Measurement Canada, OIML R129 *(see Appendix G)*

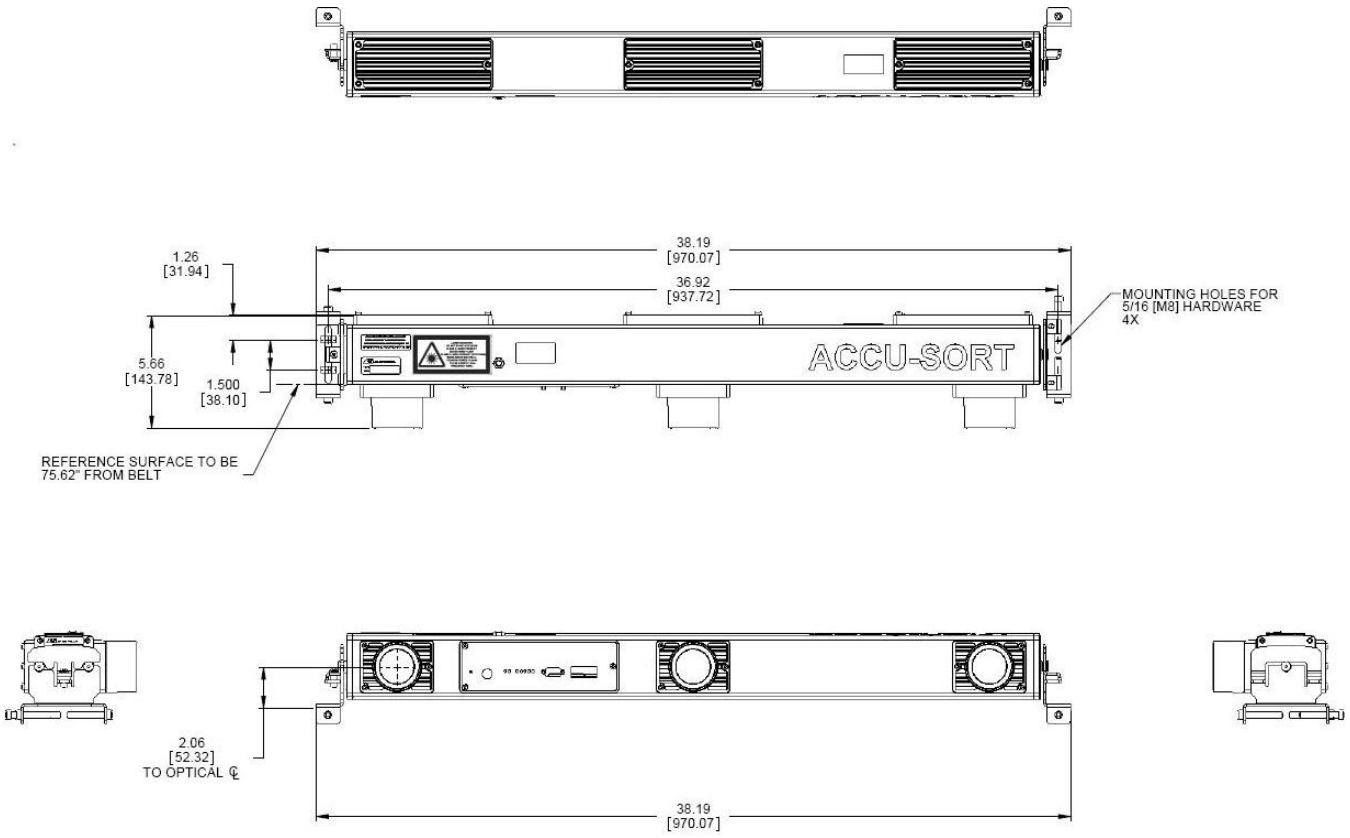
** Actual performance may vary with configuration and application.*

Power Consumption Estimates

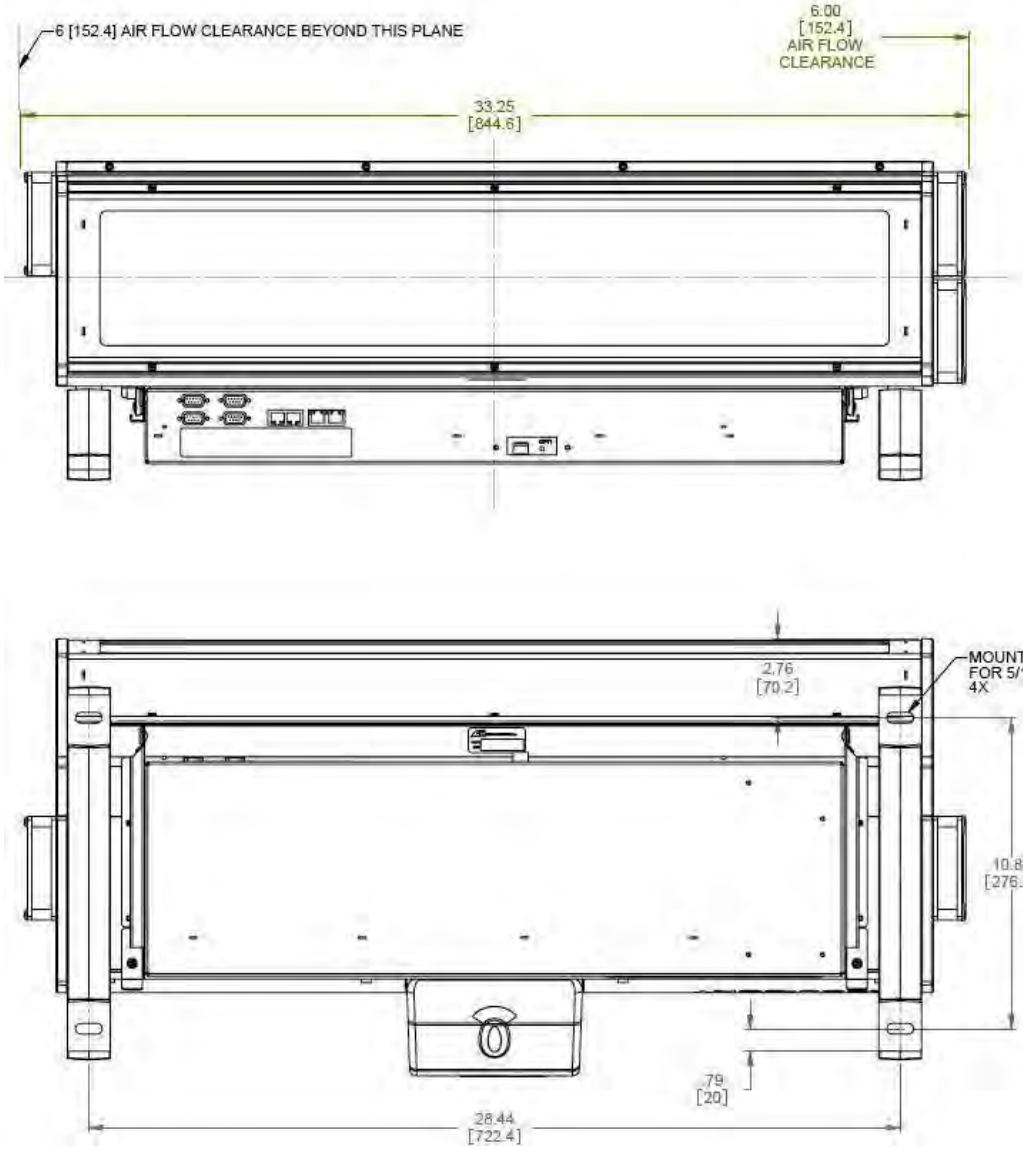
		3-Camera Tunnel		4-Camera Tunnel		5-Camera Tunnel		6-Camera Tunnel	
Device	**Volt-amps Each Unit**	Qty.	Extended Volt-amps	Qty.	Extended Volt-amps	Qty.	Extended Volt-amps	Qty.	Extended Volt-amps
AV6010 Camera System 42" [107 cm]	**405**	3	1215	4	1620	5	2025	6	2430
AV6010 RangeFinder	**23**	1	23	1	23	1	23	1	23
Network Switch	**23**		0		0	1	23	1	23
VisionCapture / IDS	**288**		0		0	1	288	1	288
LCD Monitor	**87**		0		0	1	87	1	87
FAST Monitor	**175**		0		0		0		0
Total Power Consumption (Volt-amperes)			**1238**		**1643**		**2446**		**2851**
Single-phase current	**115 VAC**		**10.8**		**14.3**		**21.3**		**24.8**
	230 VAC		**5.4**		**7.1**		**10.6**		**12.4**

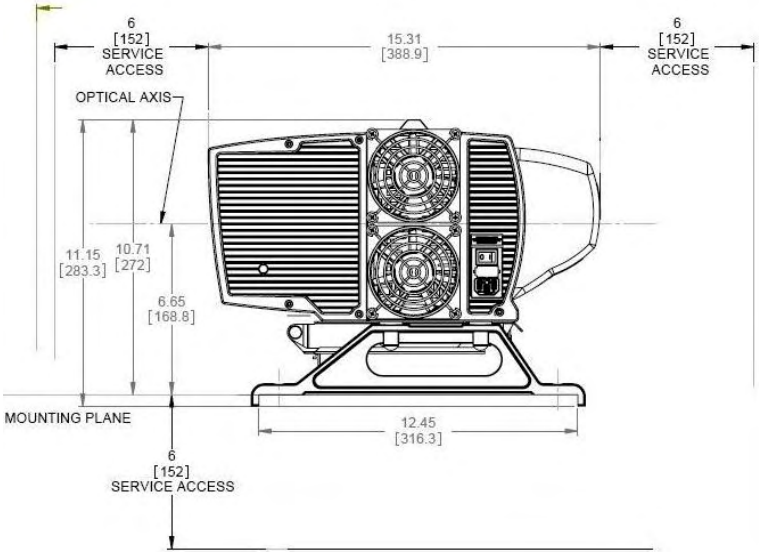
NOTE: Inrush current is approximately 15 times the running current.

RangeFinder Dimensions



AV6010 Camera Dimensions



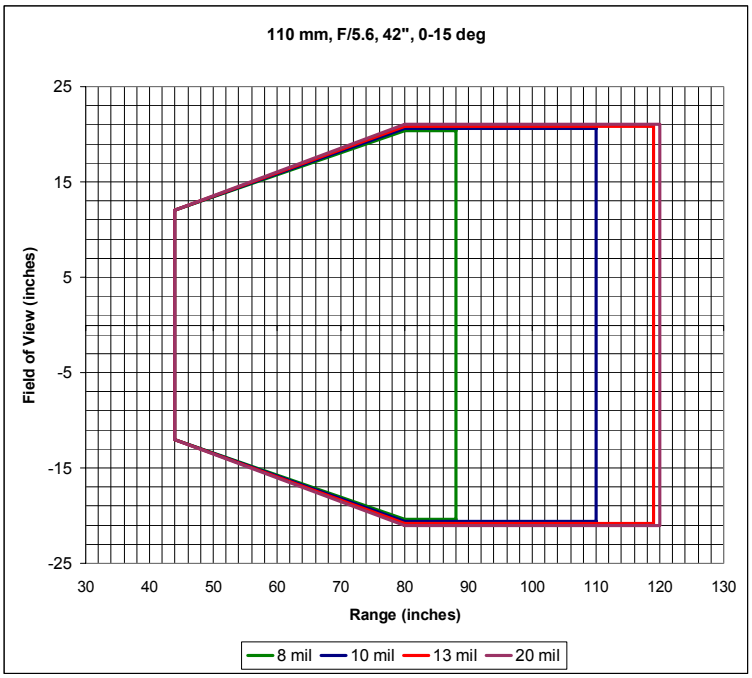


Dimensions for the 30-inch camera shown.

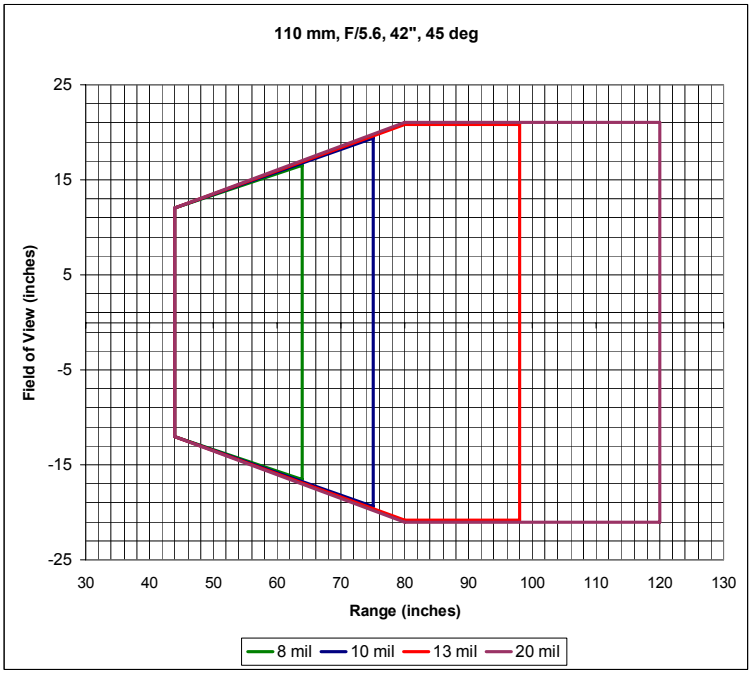
The differences for the 42-inch camera are shown below:

Overall Length	45.25 [1149.4]
Mounting Footprint	40.44 [1027.2]

Read Charts



		110 mm, F/5.6, 42", 0-15 deg							
Optical Range									
Density	mils	8 mil		10 mil		13 mil		20 mil	
Near Left	inches	44.0	0.0	44.0	0.0	44.0	0.0	44.0	0.0
Near Left Wide	inches	44.0	12.0	44.0	12.0	44.0	12.0	44.0	12.0
Far Left	inches	80.0	20.4	80.0	20.6	80.0	20.8	80.0	21.0
Far Right	inches	88.0	20.4	110.0	20.6	119.0	20.8	120.0	21.0
Far Right Wide	inches	88.0	-20.4	110.0	-20.6	119.0	-20.8	120.0	-21.0
Near Right Wide	inches	80.0	-20.4	80.0	-20.6	80.0	-20.8	80.0	-21.0
Near Right	inches	44.0	-12.0	44.0	-12.0	44.0	-12.0	44.0	-12.0
Near Left	inches	44.0	0.0	44.0	0.0	44.0	0.0	44.0	0.0



		110 mm, F/5.6, 42", 45 deg							
Optical Range									
Density	mils	8 mil		10 mil		13 mil		20 mil	
Near Left	inches	44.0	0.0	44.0	0.0	44.0	0.0	44.0	0.0
Near Left Wide	inches	44.0	12.0	44.0	12.0	44.0	12.0	44.0	12.0
Far Left	inches	64.0	16.5	75.0	19.4	80.0	20.8	80.0	21.0
Far Right	inches	64.0	-16.5	75.0	-19.4	98.0	20.8	120.0	21.0
Far Right Wide	inches	44.0	-12.0	44.0	-12.0	98.0	-20.8	120.0	-21.0
Near Right Wide	inches	44.0	0.0	44.0	0.0	80.0	-20.8	80.0	-21.0
Near Right	inches					44.0	-12.0	44.0	-12.0
Near Left	inches					44.0	0.0	44.0	0.0

All customer applications are reviewed by Accu-Sort applications engineers to assure the best camera solution is specified for the application's unique requirements including transport speed and symbologies being read. Above is a sample read chart for the 110 lens version of the camera. This read chart is intended for use as an example only.

Certifications

UL Listing	UL Listed UL Listed to Canadian safety standards Standard to which conformity is declared: EN60950: Test Spec: IEC 60950 3RD Edition / (2000) (Information Technology Equipment (I.T.E.), Including Electrical Business Equipment
	Standards to which conformity is declared: FCC 47 CFR, Part 15, subpart B, “Unintentional Radiators” **AV6010 Camera:** CLASS A Radiated Emissions CLASS A Conducted Emissions **AV6010 RangeFinder:** CLASS A Radiated Emissions CLASS B Conducted Emissions
	Standards to which conformity is declared: **1 Emissions** EN 61000-6-4: 2001 CISPR 11:1999 Radiated Emissions – Class A CISPR 11:1999 Conducted Emissions – Class A **2 Immunity** EN 61000-6-2: 2001 Electromagnetic Compatibility - Generic Standards - Immunity for industrial environments EN 61000-4-2:1995, Electromagnetic compatibility (EMC), Electrostatic discharge immunity test EN 61000-4-3: 2001, (EMC), Part 4 - Section 3: Radiated, radio-frequency electromagnetic field test EN 61000-4-4:2004, (EMC), Electrical fast transient/burst immunity test EN 61000-4-5:1995, (EMC), Part 4 - Section 5 Surge immunity test EN 61000-4-6:2003, (EMC), Part 4 - Section 6 Immunity to conducted disturbances, induced by radio-frequencies IEC 61000-4-11: 2003, (EMC), Part 4 - Section 11 Voltage dips, short interruptions & variations immunity IEC 61000-3-2 A14, 3/2000 and 61000-3-3: Harmonic current emissions Fluctuating and Steady State Harmonics)
Certified Dimensioning	*The specifications and links to the certificates of conformity for AV6010 Dimensioning Systems are provided at the end of Appendix G.*

Notes:

B AV6010 User Interface

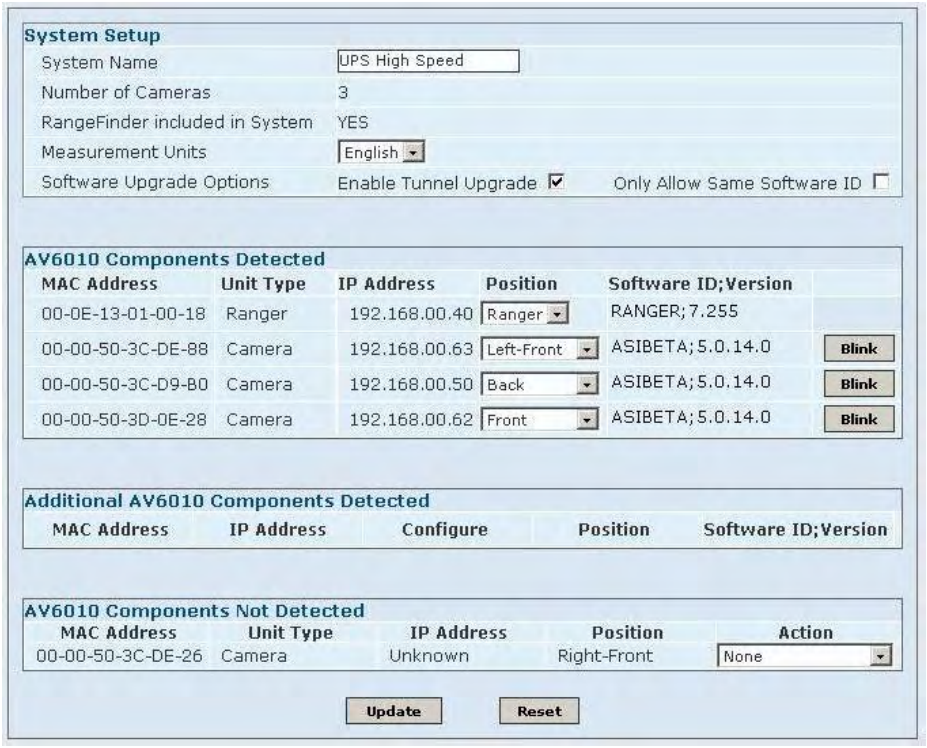
This appendix provides tables of parameter definitions and descriptions for each screen provided in the AV6010 User Interface.

AV6010 User Interface Login Screen *(current version 6.0)*

AV6010 User Interface Homepage

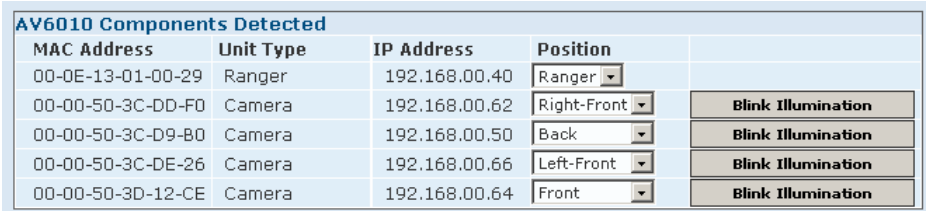
IMPORTANT: Step-by-step procedures are provided in *Chapter 5*.

System Configuration



Example from a single camera system with RangeFinder (software version 5.0)

Example AV6010 Components Not Detected, Action drop-down list

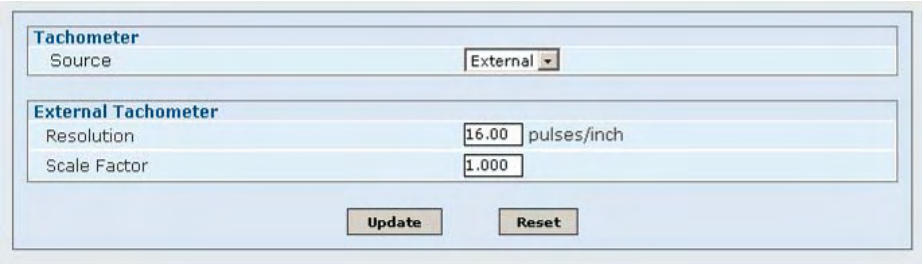


Example from a multi-camera system (software version 3.x)

System Configuration Descriptions

Selection	Definition
System Setup	System Name – User definable name for system
	Number of Cameras – Identifies number of camera connections found
	RangeFinder included in System – Indicates whether or not a RangeFinder connection is found
	Measurement Units – English or Metric
	Software Upgrade Options – **Enable Tunnel Upgrade** – This will cause a software update to be 'propagated' to all cameras in a tunnel. In other words, the user loads the software to one camera, and the other cameras will then detect the upgrade, retrieve the software from the upgraded camera, and upgrade themselves. Unchecking this box, disables this feature. This is not normally desirable, but it can be if you just want to test new software on one camera. It is also necessary if you are loading an older software version - which, by the way, must be done by loading the software to each camera. **Only Allow Same Software ID** – The software names now consist of two parts: a software ID (such as ASISTD) and the version number. This checkbox tells the cameras to only retrieve software (or a newer revision) from another camera if the ID is the same. This should normally be enabled. This scenario this option prevents is one such as a DCM with a newer version of standard software being installed in a tunnel with custom software (based on an older standard). Without this option, the tunnel would upgrade itself automatically to the 'newer' standard software, which would be undesirable.
AV6010 Components Detected	MAC Address – Cameras unique MAC address
	Unit Type – Identifies whether the unit is a RangeFinder or camera
	IP Address – IP address provided by the DHCP AV6010
	Position *(drop-down list)* – Use to identify the camera position in a tunnel system
	Software ID; Version
	Blink (button) – Use to blink the illumination of a camera to confirm location and operation
Additional AV6010 Components Detected	New components to be added to the AV6010 system appear here. For example: During initial setup, all cameras and the RangeFinder are listed. If the RangeFinder or a camera DCM is ever replaced, they will also appear here. The Configure column offers button options: New or Replace.
Update	After making changes to either the System Name or camera Positions, click to Update.
Reset	After making changes to either the System Name or camera Positions, click to Reset to previously saved information.

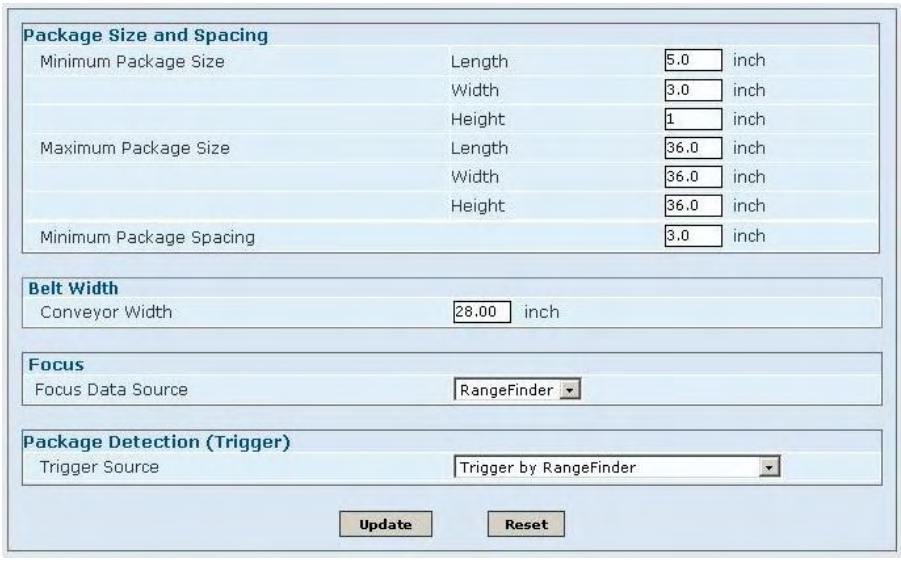
Tachometer



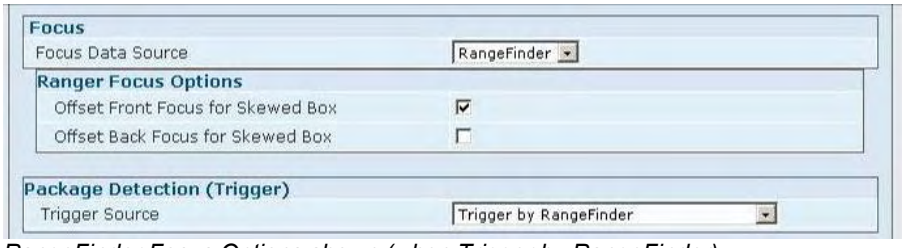
Setup > Tachometer Descriptions

Selection	Definition
Tachometer	Source *(drop-down list)*
	External – Uses an external hardware tachometer, typically mounted under the conveyor belt.
	Internal – Uses an internal software calculated tachometer.
External Tachometer	Resolution – Set the tachometer pulses per inch (from # to #)
	Scale Factor – Do not change. *(Only used in dimensioning systems.)*
Internal Tachometer	Belt Speed (feet/minute)

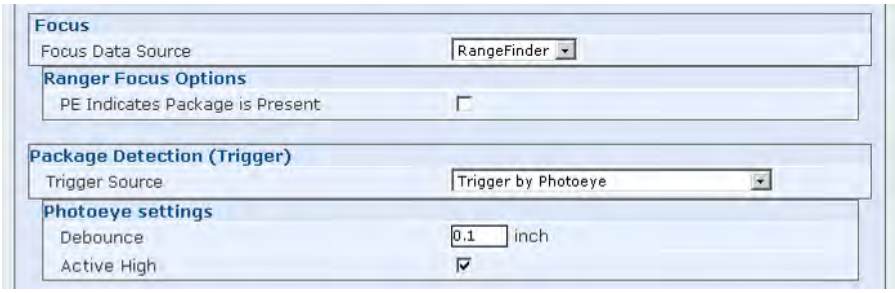
Focus and Detection



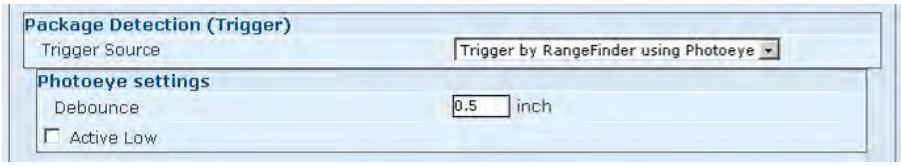
Trigger by RangeFinder only



RangeFinder Focus Options shown (when Trigger by RangeFinder)



RangeFinder Focus Options shown (when Trigger by Photoeye)



Trigger by RangeFinder using Photoeye, additional Photoeye settings shown

Setup > Focus and Detection Descriptions

Selection	Definition
Package Size and Spacing	Minimum Package Size – Set the length, width and height of the minimum package size. Packages smaller than these dimensions will not be processed by the system
	Minimum Package Size – Set the length, width and height of the maximum package size. Packages larger than these dimensions will not be processed by the system
	Minimum Package Spacing – Set the minimum space allowed between packages.
Belt Width	Conveyor Width – Set the width of the conveyor belt in inches.
Focus Data Source *(drop-down list)*	After making a selection from this drop-down list, click Update.
	Fixed Focus – Sets the cameras focus to a fixed distance from the camera's lens. Bottom-read cameras default to the fixed focus setting. If setting any other camera for fixed focus, there are other settings that must be made. *(See Mounting > Camera.)*
	RangeFinder – The RangeFinder provides the focus information to the camera(s). RangeFinder Focus Options available when the RangeFinder is performing the package detection: **Offset Front Focus for Skewed Box** - If a box is skewed, this option provides a front-read camera with an 'offset' in the front of the box, so the focus does not start at the front corner. **Offset Back Focus for Skewed Box** - If a box is skewed, this option provides a back-read camera with an 'offset' in the back of the box, so the focus does not start at the front corner. RangeFinder Focus Options when a photoeye is used for package detection: **PE Indicates Package is Present** – This option should not be checked for tilt-tray applications.
	Light Curtain – The light curtain provides the focus information to the camera
Package Detection (Trigger) *(drop-down list)*	Trigger Source – These options change depending on the focus source
	Trigger by RangeFinder – RangeFinder provides the start/end of packages signal.
	Trigger by Photoeye – Photoeye input is used to determine the start/end of packages.
	Trigger by Rangefinder using Photoeye – In this case, the RangeFinder uses the Photoeye data combined with the ranging information to provide a continuous trigger for the package.
	Trigger by Bottom Camera PE – Special case of 'Trigger by Photoeye' where the photoeye is connected to a bottom-read camera that is upstream from the Rangefinder.
Photoeye Settings	The photoeye settings are only displayed when a photoeye is involved with package detection. They are not displayed when the RangeFinder is the only trigger source.
	Debounce set in inches
	Active Low (checkbox)

Mounting > RangeFinder

Setup > Mounting > RangeFinder Descriptions

Selection	Definition
Mounting Angles	Roll –The offset for leveling the RangeFinder with the scanning surface
	Yaw (0 or 180) – The offset for identifying the RangeFinder mount as Standard or Non-Standard. (The Yaw should either be 0 or 180. The RangeFinder mounting should be changed to position it to the scanning surface)
Mounting Position	Dist from Photoeye (X) –(Optional) This is the distance from the read now trigger source to the RangeFinder or light curtain
	Left/Right Offset (Y) –Compensates for the RangeFinder not being centered to the scanning surface.
	Mounting Height (Z) –Height that the RangeFinder is mounted off the scanning surface
RangeFinder Ignore Limits	Left (-) – Identifies the usable area on left side of the RangeFinder. This is referenced from the center of the RangeFinder. Any codewords that are beyond the dimension set in this field will be ignored.
	Right (+) –Identifies the usable area on left side of the RangeFinder. This is referenced from the center of the RangeFinder. Any codewords that are beyond the dimension set in this field will be ignored.
RangeFinder Settings	Minimum Separation for Side by Side Detect (in inches) - Identifies the separation between boxes that must be maintained in order to correctly identify a side by side condition.

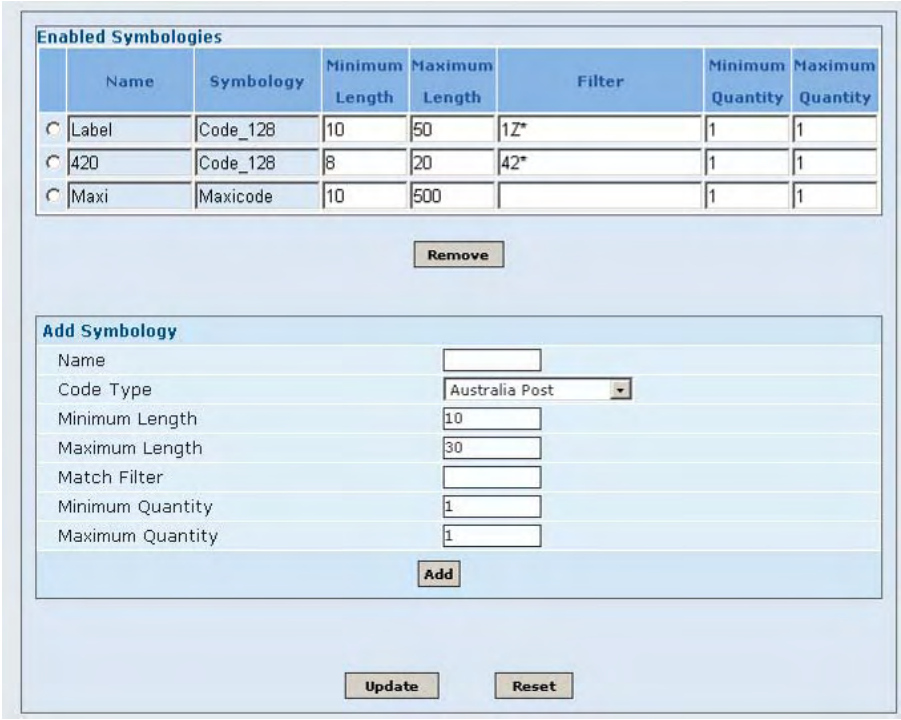
Mounting > (Camera Orientation)

Setup > Mounting > (Camera Orientation) Descriptions

Selection	Definition
Mounting Angles	Camera Pitch Angle – This is the angle of the camera mirror in relation to the product to be scanned.
	Camera Yaw (0 to 180) – This is the position of the camera in relations to the direction of product flow. The camera yaw affects the decoding of certain types of bar codes. It also affects the orientation of the image in the image viewer.
Mounting Position	Dist. From Trigger (X) –This is the distance from the RangeFinder or light curtain to the AV6010 read area.
	Camera Offset (Y) – This option aligns the package to the software cropping area. Used with image cropping. *(See Communications > (Camera) > Image Network.)*
	Mounting Height (Z) – Defines the farthest distance a package will be seen by the AV6010.
Tracking Box Extensions	Front – Extends the trigger signal on the front of the box
	Back – Extends the trigger signal on the Back of the box

A camera mounting screen is available for every camera connected to the system (e.g., front, top, back, sides, and bottom) as shown on the **System Configuration** screen. These parameters must be set individually for each camera in the system.

Symbologies



Example with three codes enabled (including filters).

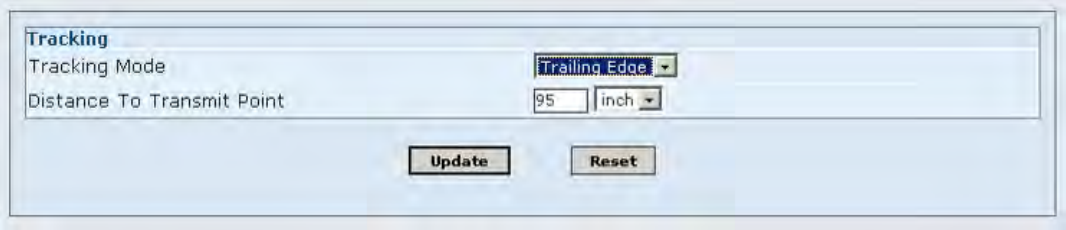
Example: ASI_Diagnostics and Dimensions should appear as enabled symbologies on dimensioning systems. These are enabled from the Code Type drop-down list.

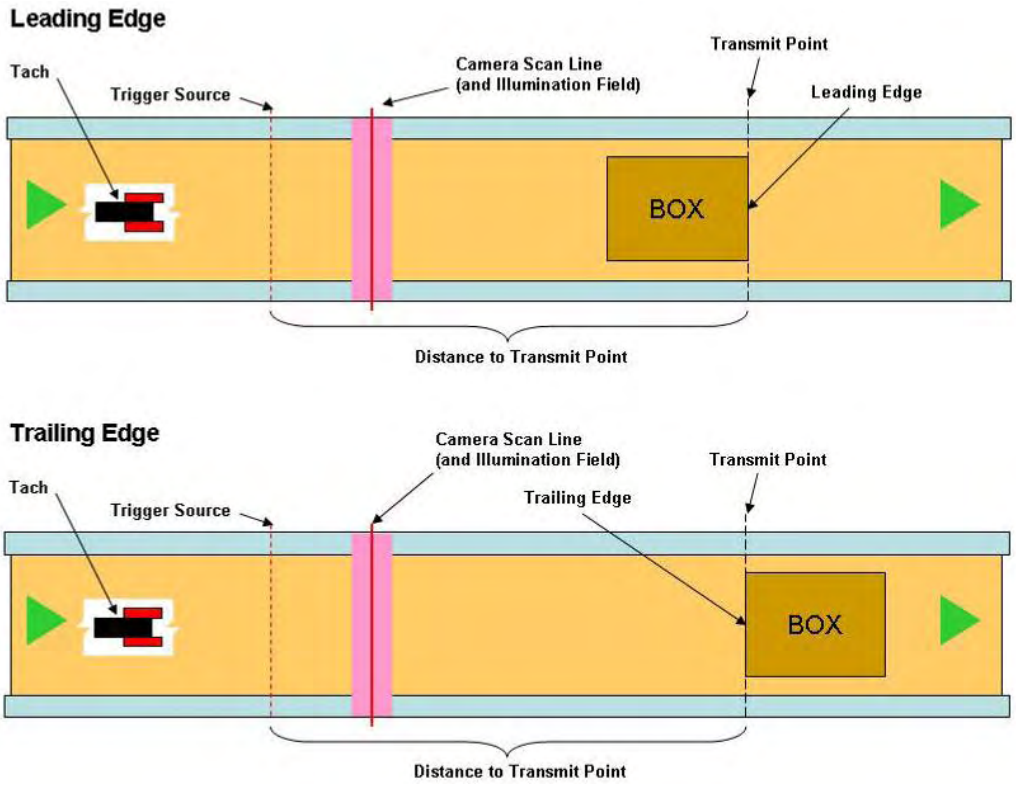
Setup > Symbologies Descriptions

Selection	Definition
Enabled Symbologies	
Selectable option	When selected, use the Remove button to delete the symbology from the active list.
Name	User-defined identifier for the code type.
Symbology	Identifies the type of bar code to be read by the camera
Min. Length	Minimum number of characters in the bar code
Max. Length	Maximum number of characters in the bar code
Filter	Used for bar code character recognition. Only the bar code with the defined character will be considered a valid read.
Min. Quantity	Minimum number of bar codes to be read from the selected symbology
Max. Quantity	Maximum number of bar codes to be read from the selected symbology
Remove *(button)*	Use in combination with the selectable option to remove a code type from the active list of selected symbologies.
Add Symbology	
Name	Define a specific name for the symbology.
Code Type	Select the symbology from the drop-list. All commonly used 1-D and 2-D symbologies are available.
	Other selections appear in this drop-down list: **ASI Diagnostic** –
	Aux Result 1 through **Aux Result 4** –
	Dimensions – Select so that dimensioning data can be included in messages. (Requires a dimensioning-enabled top read camera.)
Min. Length thru Max. Quantity - See above	
Add *(button)*	Use to add a new symbology to the Enabled Symbologies list.

Set the symbologies once. The enabled symbologies list is used by all cameras in a system.

Communications > (Camera) > Transmit Point





Selection	Definition
Tracking Mode *(drop-down list)*	Select a mode from the drop-down list.
	Trailing Edge – Use the trailing edge of packages to start a counter when it leaves the trigger source. When the counter reaches zero, the host message is transmitted.
	Leading Edge – Use the leading edge of packages to start a counter when it 'hits' the trigger source. When the counter reaches zero, the host message is transmitted.
Distance to Transmit Point	Distance from the trigger source to when the host message is transmitted. This distance is set in inches.

Available for every camera connected to the system (e.g., front, top, back, sides, and bottom). The transmit point must be set individually for each camera in the system.

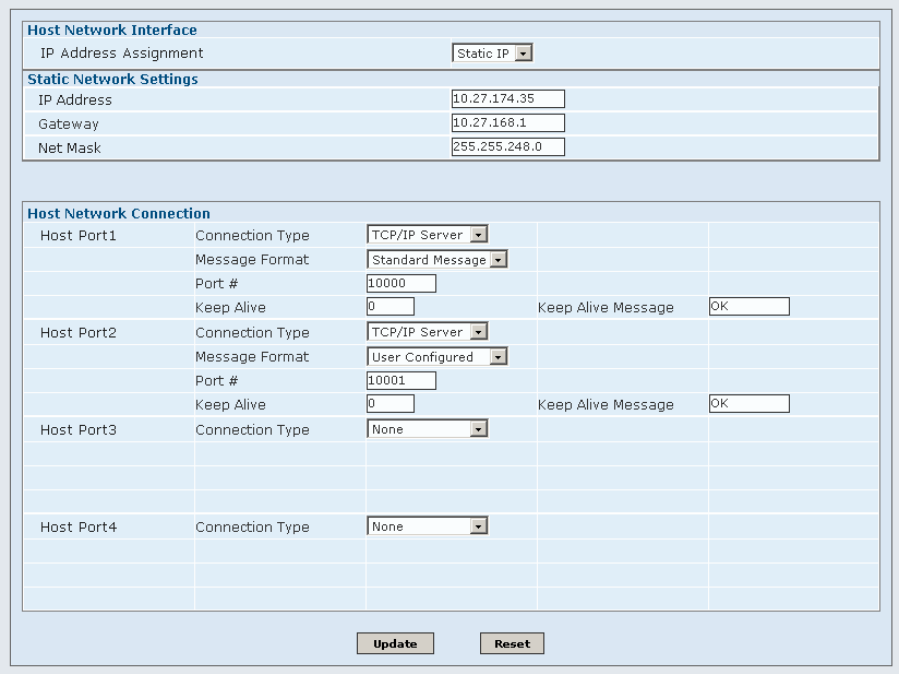
Communications > (Camera) > Serial Com

Serial Com Descriptions

Selection	Definition
Serial Port Settings	
Baud Rate	Set from 1200 to 115,200.
Stop Bits	Set for 1 or 2.
Parity	None
	Even
	Odd
Data Bits	Set for 7 or 8.
Flow Control	None
	Hardware
	Software
Serial Messaging	
Transmit Message Type	None
	Standard Message – STX data LF (qty of data fields are determined on the number of bar codes enabled)
	Long Message – STX00000,XXXX,DATA,QQ,YYYLF STX – Header 00000 – Sequence number XXXX – Box Length (in tach pulses) Data – Bar code data. (qty of data fields are determined on the number of bar codes enabled) QQ – quality of reads YYY – camera head identifier LF – Trailer
	User Configured – This option provides a configurable menu for the customer to construct the host message format
	Custom Message –This message is hardcoded by software.
Keep Alive Time (sec)	This defines how often the AV6010 will transmit the heartbeat message
Keep Alive Message	This defines the content of the heartbeat message

Available for every camera connected to the system (e.g., front, top, back, sides, bottom).

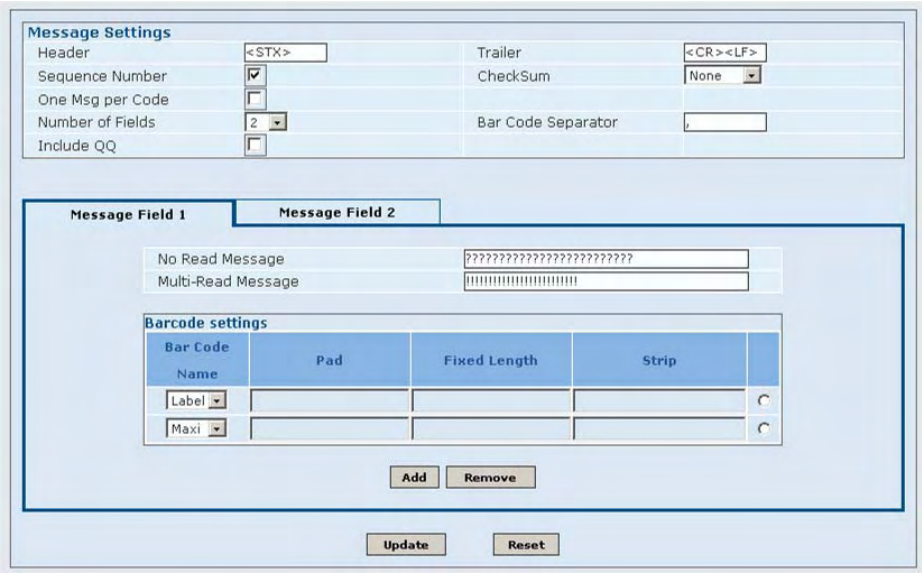
Communications > (Camera) > Host Network



Host Network Descriptions

Selection	Definition
Host Network Interface	
IP Address Assignment *(drop-down list)*	Set as a Dynamic or Static IP.
Host Network Connection *(Functionality is identical for Host Network Ports 1 through 4.)*	
Connection Type *(drop-down list)*	TCP/IP Server – The AV6010 will function as the Ethernet server
	TCP/IP Client – The AV6010 will function as the Ethernet client
	UDP Messaging – The AV6010 message will be in the UDP format (User Datagram Protocol)
	Fast Monitor –The AV6010 will sent a message in the Fast Monitor format. This is a diagnostic message.
	None
Message Format *(drop-down list)*	Standard Message – STX data LF (qty of data fields are determined on the number of bar codes enabled)
	Long Message – STX00000,XXXX,DATA,QQ,YYYLF STX - Header 00000 – Sequence number XXXX – Box Length (in tach pulses) Data – Bar code data (qty of data fields are determined on the number of bar codes enabled) QQ – quality of reads YYY – camera head identifier LF – Trailer
	User Configured – This option provides a configurable menu for the customer to construct the host message format
	Custom Message – This message is hardcoded by software.
Port Number	Set the port number.
Keep Alive	This is the heartbeat message timer. It defines the timing in milliseconds on how often the keep alive message should be transmitted to the host.
Keep Alive Message	This is the heartbeat message. The AV6010 will send this message to the host to identify that it is functioning even if product is not moving on the conveyor.

Communications > (Camera) > Host Network > Network Messaging



Functionality is identical for Serial Ports and Host Network Ports 1 through 4.

Host Network > Network Messaging Descriptions

Selection	Definition
Message Settings	
Header	Set the message header.
Trailer	Set the message trailer.
Sequence Number	Transmits a sequential number with each message transmitted when checked.
CheckSum	Transmits a calculated checksum providing a level of security for the message.
One Message per Code	Only includes one message per code when checked.
Number of Fields	This option defines the number of fields in the transmit message.
Bar Code Separator	Define the separator to appear between bar codes.
Include QQ	Includes the QQ which is the quality or number of times the AV6010 decoded the bar code during the trigger cycle. Provides the QQ Delimiter field when checked.
Message Field 1	
No Read Message	Customer selectable character that will be transmitted when no bar code was read
Multi-Read Message	Customer selectable character that will be transmitted when the AV6010 decodes bar codes with the same symbology and the same number of characters
Bar Code Settings	Select a Bar Code Name from the drop-list. (These are the codes that appear in the Active Symbologies list.) The padding, fixed length and stripping are shown in the fields. Use the option buttons to Add or Remove the code from Message Field 1.
Message Field 2	
Note: Same functionality as Message Field 1.	

Communications > (Camera) > Image Network

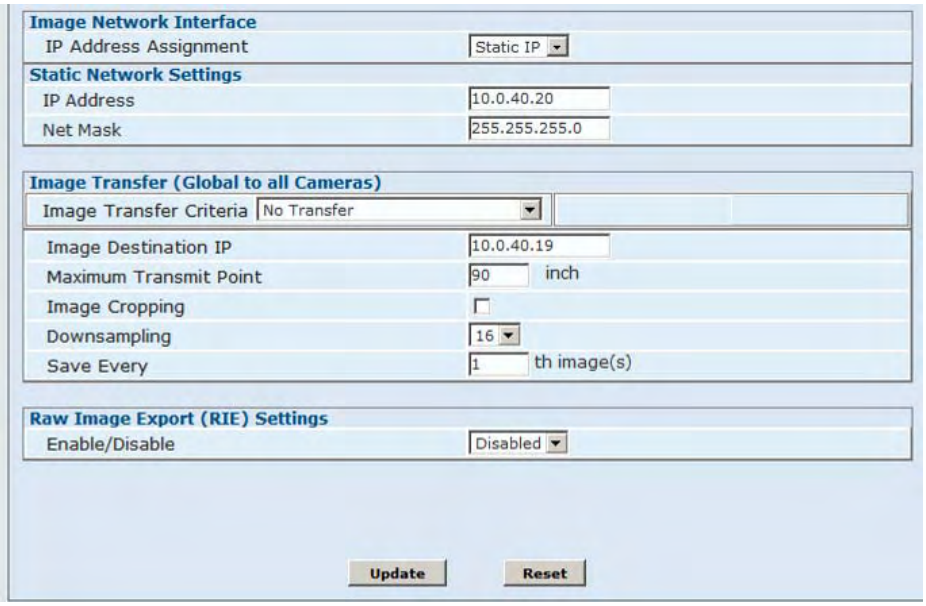
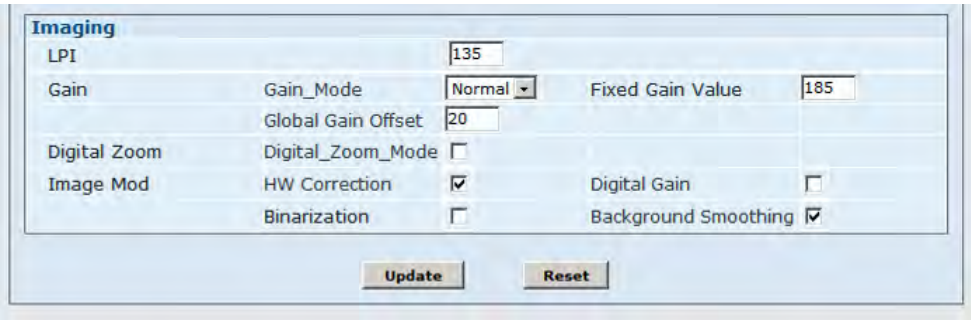


Image Network Descriptions

Selection	Definition
Image Network Interface	
IP Address Assignment *(drop-down list)*	Static IP – The IP address is manually entered in the IP address field
	Dynamic IP-The AV6010 will receive an IP address from a DHCP server
Static Network Settings	
IP Address	Enter an IP address within the range of the IDS. Typically the address is 10.0.40.xx. XX ranges from 21 to 25.
Net Mask	Enter an appropriate NetMask address. Typically the address is 255.255.255.0
Image Transfer (Global to all Cameras)	
Image Transfer Criteria *(drop-down list)*	No Transfer –The AV6010 will not transmit any images
	All Packages –Transmit an image with every trigger cycle
	No Code Read – Transmit the image if no bar codes were read
	No Dimensions Read – Transmit the image if no dimensions were read
	Verifiy Bar Code Failed – Transmit the image if the verification bar code failed
	Custom – Custom defined condition for transmitting images
Image Destination IP	Destination of PC where images will be sent. Typically this is the IDS server. 10.0.40.19
Transmit Point (NOT USED)	Set in inches. This is the point where the images are sent out of the camera. This number must be less then the HOST transmit point.
Image Cropping	When enabled only the cropped part of the image will be transmitted.
Downsampling	
Raw Image Export (RIE) Settings	Use to enable or disable the raw image export capabilities of an RIE-capable camera. For details on the RIE Settings, see Appendix H.

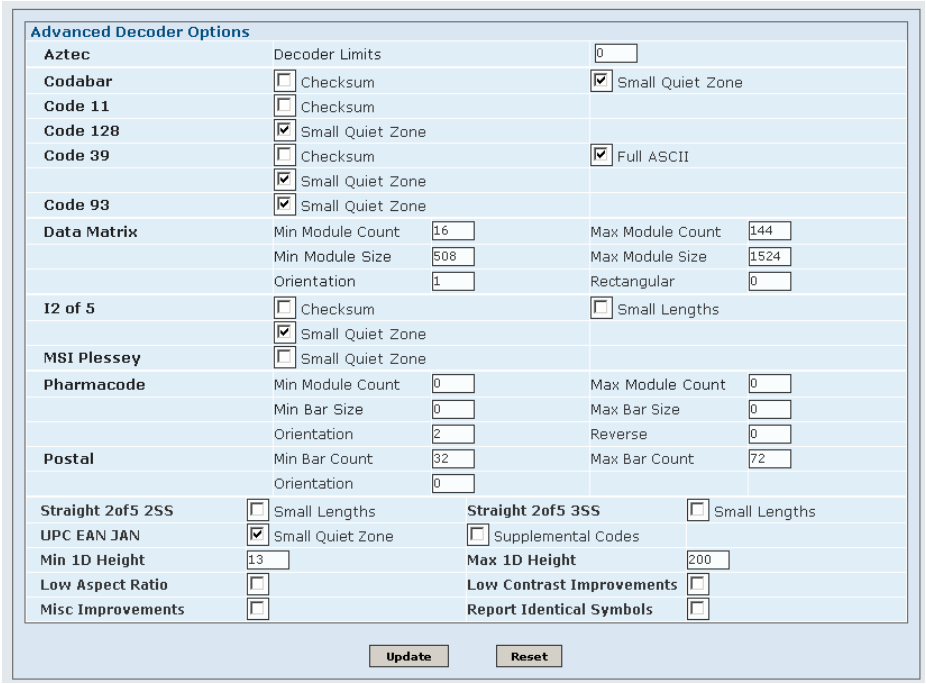
Advanced > Imaging > (Camera)



Setup > Advanced > Imaging Descriptions

Selection	Definition
LPI	The Wizard will automatically fill this field. The LPI is set to equal the DPI at the far scanning point. This matching of the DPI to the LPI assures the pixels are not over squared, which can cause a no read.
Gain	Gain Mode *(drop-down list)* – Normal. This is the run mode. It allows the AV6010 to dynamically adjust it gain depending on the package height and conveyor speed.
	Fixed Gain Value – This option is only used for testing. It should be set to Normal for regular operation
	Global Gain Offset –This is adjusted when the overall image is too dark or light. It will enhance the gain in the AV6010 to provide a greater contrast between the black and white elements in the bar code
Digital Zoom	Digital Zoom Mode *(checkbox)* – When digital zoom is selected the camera will maintain the target DPI through the depth of field
Image Mod	HW Correction *(checkbox)*
	Digital Gain – This option will digital increase image gain.
	Binarization – *(Not available at this time.)*
	Background Smoothing

Advanced > Decoder Options

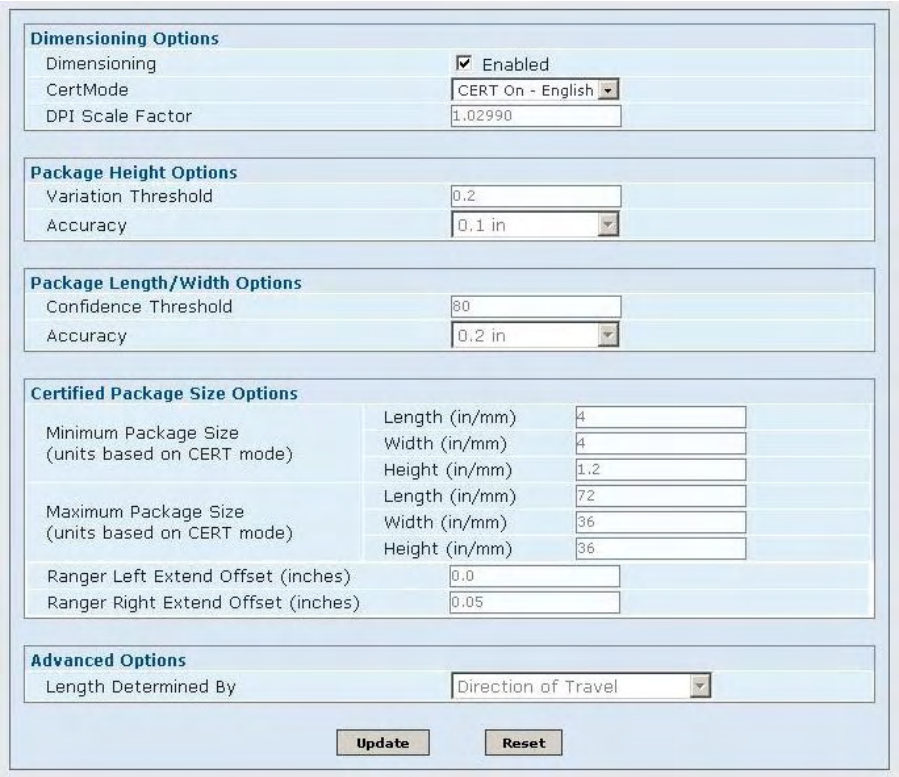


Use to set special parameters for the different bar code symbologies.

Advanced Decoder Options Descriptions

Selection	Definition
Aztec	Decoder Limits
Codabar	Checksum
Code 11	Checksum
Code 128	Small Quiet Zone
Code 39	Checksum
	Full ASCII
	Small Quiet Zone
Code 93	Small Quiet Zone
Data Matrix	Minimum Module Count
	Maximum Module Count
	Minimum Module Size
	Maximum Module Size
	Orientation
	Rectangular
I2 of 5	Checksum
	Small Lengths
MSI Plessey	
Pharmacode	Minimum Module Count
	Maximum Module Count
	Minimum Bar Size
	Maximum Bar Size
	Orientation
	Reverse
Postal	Minimum Bar Count
	Maximum Bar Count
	Orientation
Straight 2 of 5 2SS	Small Lengths
Straight 2 of 5 3SS	Small Lengths
UPC EAN JAN	Small Quiet Zone Supplemental Codes – Use to enable extensions.
Min 1D Height	Sets the minimum height for 1D bar codes.
Max 1D Height	Sets the maximum height for 1D bar codes.
Low Aspect Ratio	
Low Contrast Improvements	
Misc Improvements	
Report Identical Symbols	

Options > Dimensioning

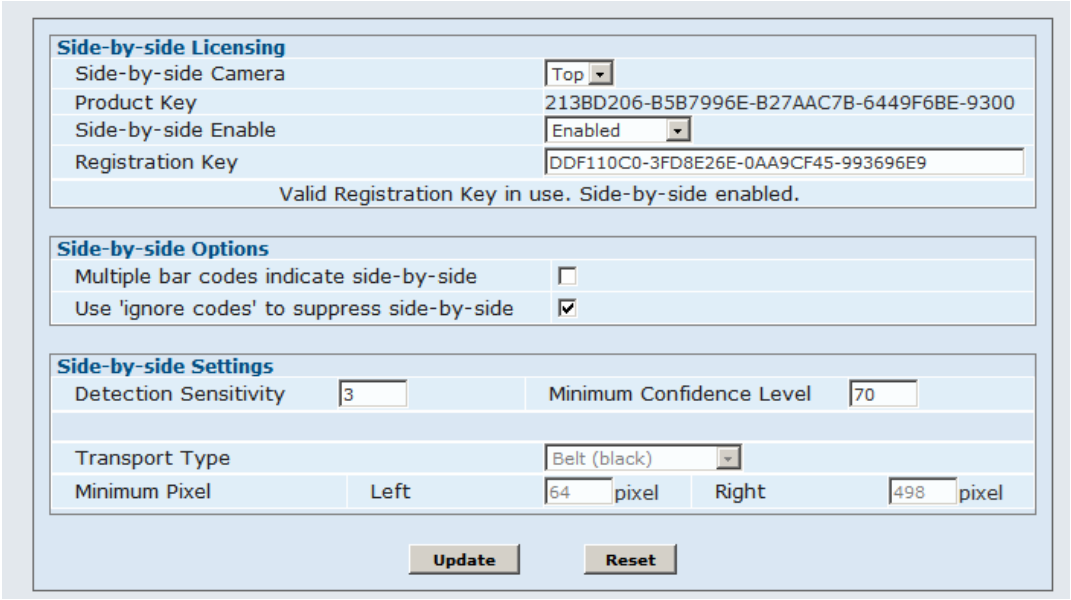


Options > Dimensioning Descriptions

Selection	Definition
Dimensioning Options	
Dimensioning	Enabled (checkbox) – Dimensioning is enabled when box is checked.
Certification Mode *(drop-down list)*	CERT Off – The certification mode of the system is turned off. Changes can only be made on this screen when the CERT Off is selected.
	CERT On - English – The certification mode is enabled and reports dimensioning data in inches.
	CERT On - Metric – The certification mode is enabled and reports dimensioning data in millimeters (12D).
	CERT On - OIML Metric – The certification mode is enabled and reports dimensioning data in millimeters (10D).
Package Height Options	
Variation Threshold	Set this to be double the height accuracy. Example: An 0.1 accuracy should have a variation threshold of 0.2.
Accuracy *(drop-down list)*	Set for 0.1, 0.2 or 0.5 (5, 10, 20 mm) based on the calibrated accuracy of the system's RangeFinder.
Package Length/Width Options	
Confidence Threshold	Enter as a percentage (0-100%)
Accuracy *(drop-down list)*	Set for 0.1, 0.2 or 0.5 (5, 10, 20 mm)
Certified Package Size Options	
Minimum Package Size	Length – Can be set to the certified minimum or greater.
	Width
	Height
Maximum Package Size	Length (up to 72")
	Width (up to 36")
	Height (up to 36")
Ranger Left Extend Offset	
Ranger Right Extend Offset	
Advanced Options	
Length Determined by	Direction of Travel
	Longest Side

See Chapter 5 for details on Dimensioning Setup and Calibration.
Additional reference information on dimensioning is provided in Appendix G.

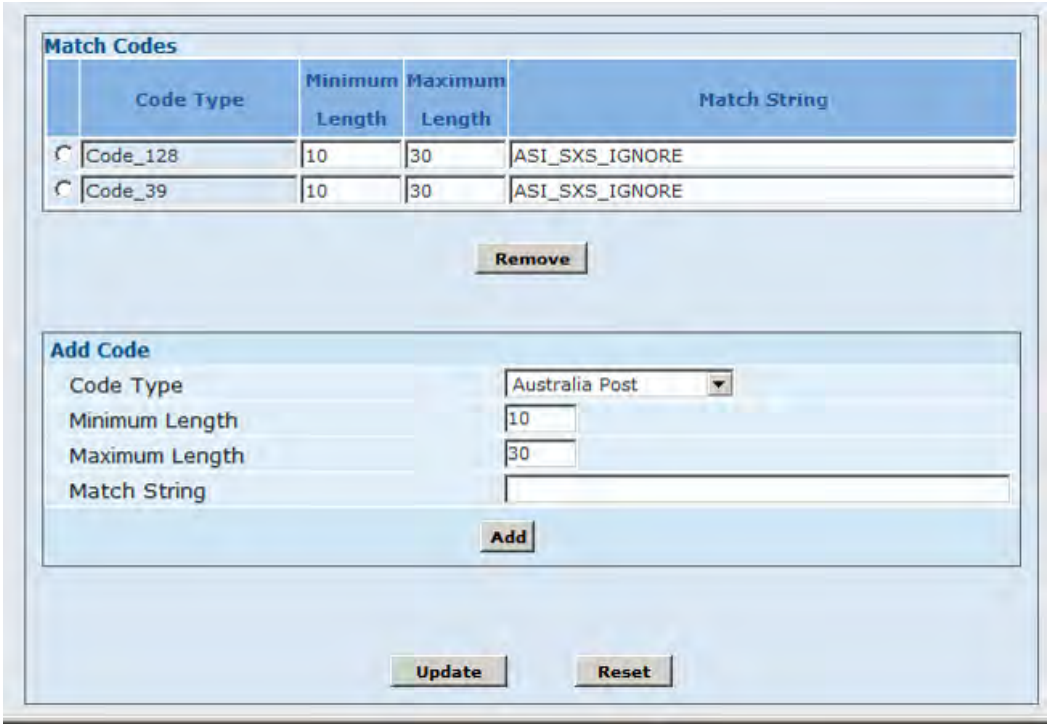
Options > Side-by-Side > Settings



IMPORTANT: *The Side-by-Side Settings are done during setup with the Camera Image Viewer. Registration of a SBS-enabled camera system must be performed by a trained and authorized Accu-Sort technician before the system can perform SBS detection during normal operations.*

See Chapter 5 for details on side-by-side product detection setup and calibration.

Options > Side-by-Side > Ignore Codes



Diagnostics > System Status

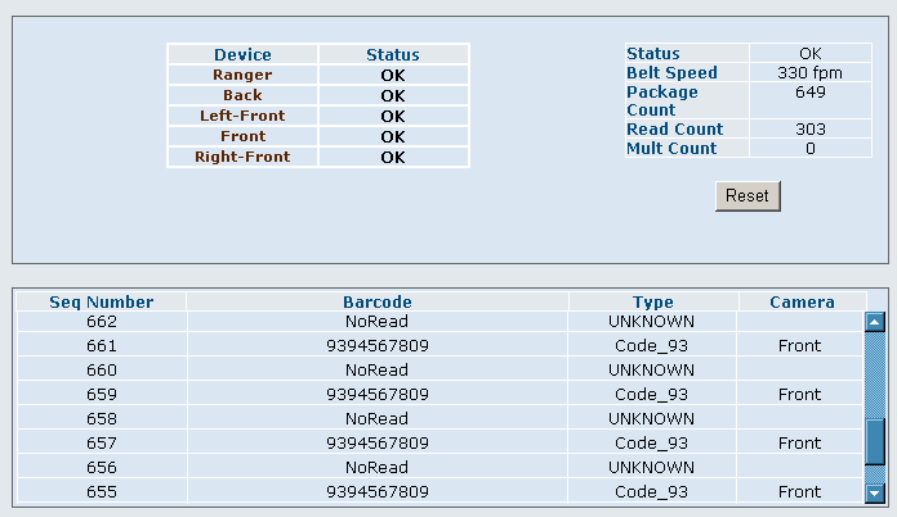
Device	Status
Ranger	OK
Top	OK

Status	OK
Belt Speed	0 fpm
Package Count	9
Read Count	8
Mult Count	0

Reset

Seq Number	Bar Code or Dimensions (LxWxH)	Result Type	Camera
9	42018969	Code_128	Top
9	1Z901W400335667264	Code_128	Top
9	18969 84003 1Z901W400335667264U	Maxicode	Top
8	1Z0691890330227036	Code_128	Top
8	42018969	Code_128	Top
8	18969 84003 1Z0691890330227036U	Maxicode	Top
7	W060402053-500000000	Code_128	Top
6	W060402053-500000000	Code_128	Top

Example for single camera system



Device	Status
Ranger	OK
Back	OK
Left-Front	OK
Front	OK
Right-Front	OK

Status	OK
Belt Speed	330 fpm
Package Count	649
Read Count	303
Mult Count	0

Reset

Seq Number	Barcode	Type	Camera
662	NoRead	UNKNOWN	
661	9394567809	Code_93	Front
660	NoRead	UNKNOWN	
659	9394567809	Code_93	Front
658	NoRead	UNKNOWN	
657	9394567809	Code_93	Front
656	NoRead	UNKNOWN	
655	9394567809	Code_93	Front

Example for multi-camera system

Diagnostics > System Status Descriptions

Selection	Definition
Device Status	OK, NOT OK, NOT PRESENT Clickable links open the status screen for the device.
Status	OK or NOT OK
Belt Speed	Identifies the conveyors current speed.
Package Count	The number of packages that have traveled through the system since the last reset of the diagnostics screen.
Read Count	Number of reads.
Mult Count	
Reset *(button)*	Use to reset the diagnostics counters on this screen.
Sequence Number	Shows the packages numbers in descending order.
Bar Code	Indicates the valid code data or if a no read condition occurred.
Type	Identifies the code type.
Camera	Identifies which camera in the system detected the bar code read.

Diagnostics > Images

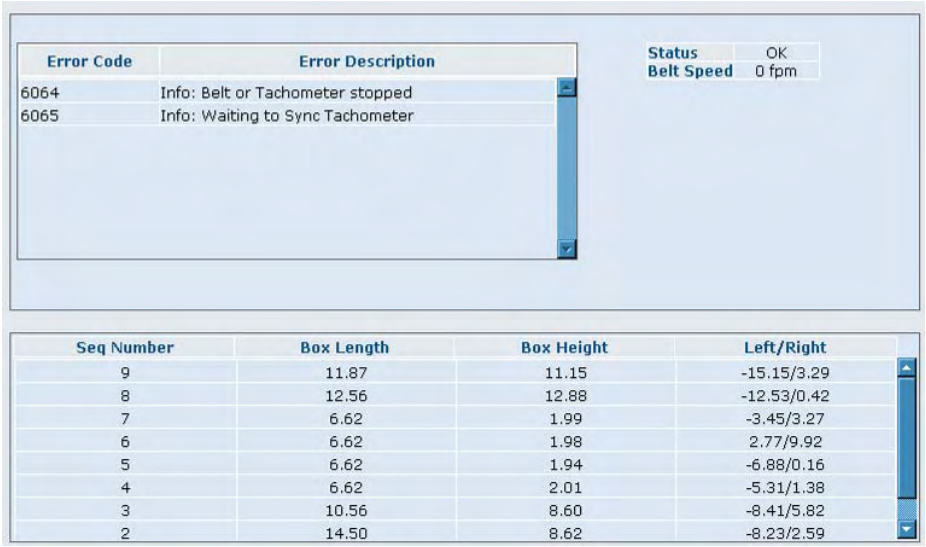
[Useful image not available at time of publication.]

Diagnostics > Images Screen

Diagnostics > Images Descriptions

[Not available at time of publication.]

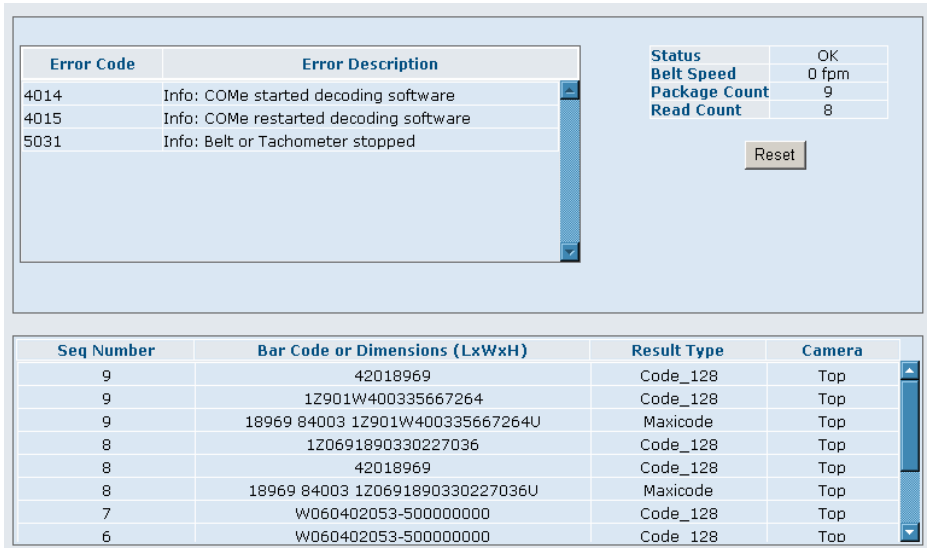
Diagnostics > RangeFinder Status



Diagnostics > RangeFinder Status Descriptions

Selection	Definition
Error Code	See *Appendix F* for a list of error codes and their descriptions. All RangeFinder error codes are in the 6000 series.
Error Description	See *Appendix F* for a list of error codes and their descriptions.
Status	The RangeFinder status is either shown as: **OK** – Functioning normally **NOT OK** – Check error codes for possible problem indicators.
Belt Speed	The speed of the package conveyance in feet per minute.
Seq Number	The sequence number assigned to packages that have passed through the RangeFinder's scanline.
Box Length	The length of the box as detected by the RangeFinder where length is measured with the direction of travel.
Box Height	The height of the box as detected by the RangeFinder.
Left/Right	

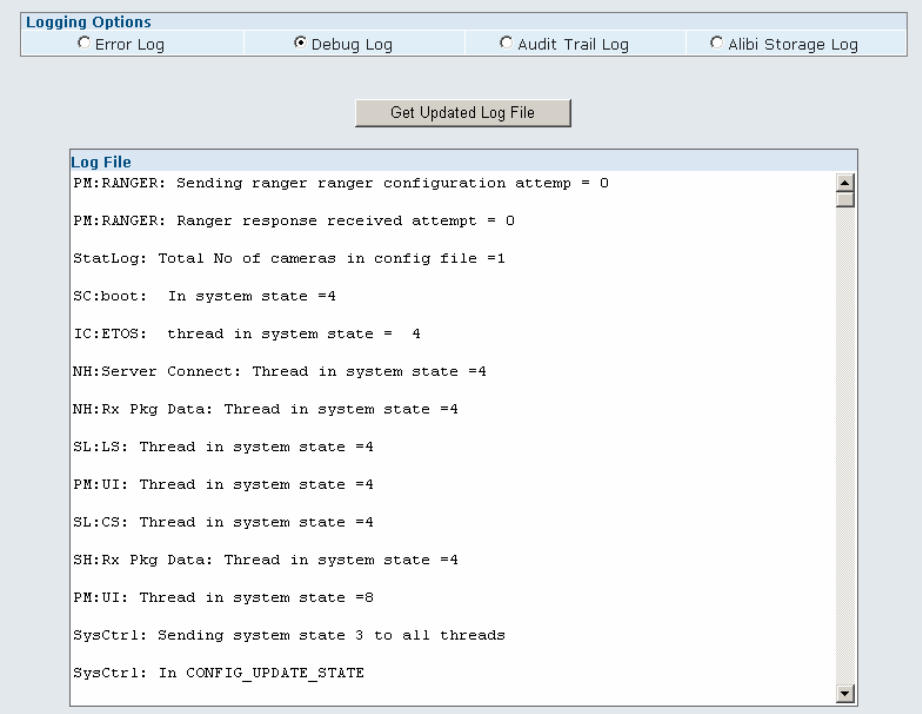
Diagnostics > (Camera) > Status



Diagnostics > Camera Status Descriptions

Selection	Definition
Error Code	*See Appendix F for a list of error codes and their descriptions.*
Error Description	*See Appendix F for a list of error codes and their descriptions.*
Status	
Belt Speed	The speed of the package conveyance in feet per minute.
Package Counts	The total number of packages that ran through the system since the last reset.
Read Count	The number of packages with decoded bar codes since the last reset.
Reset *(button)*	Use to reset the diagnostics counters on this screen.
Seq Number	The sequence number of the package scanned by the camera.
Bar Code or Dimensions (LxWxH)	Displays the bar code data decoded from the package or the dimensioning data (length x width x height) for a TOP reading camera that is equipped with the Dimensioning COM-e module.
Result Type	Identifies the type of bar code that was decoded.
Camera	Identifies the camera that decoded the bar code.

Diagnostics > (Camera) > Logging



Diagnostics > Camera Log Descriptions

Selection	Definition
Logging Options	
Error Log	Displays the Error Log in the Log File when selected.
Debug Log	Displays the Debug Log in the Log File when selected.
Audit Trail Log	Only available on the top-read camera of a dimensioning system. See Appendix G for more information.
Alibi Storage Log	Only available on the top-read camera of a dimensioning system. See Appendix G for more information.
Get Updated Log File *(button)*	After selecting a log from the option buttons, click this button to update the data being displayed in the Log File.
Log File	
	Scrollable log based on the selection made under Logging Options.

Diagnostics > (Camera) > Image

The top half of this diagnostics screen displays a thumbnail of the image.

Diagnostics > Image (Camera) Descriptions

Selection	Definition
Seq Number	The sequence number of the package scanned by the camera.
Bar Code or Dimensions (LxWxH)	Displays the bar code data decoded from the package or the dimensioning data (length x width x height) for a TOP reading camera that is equipped with the Dimensioning COM-e module.
Result Type	Identifies the type of bar code that was decoded.
Camera	Identifies the camera that decoded the bar code.

Diagnostics > (Camera) > Versions

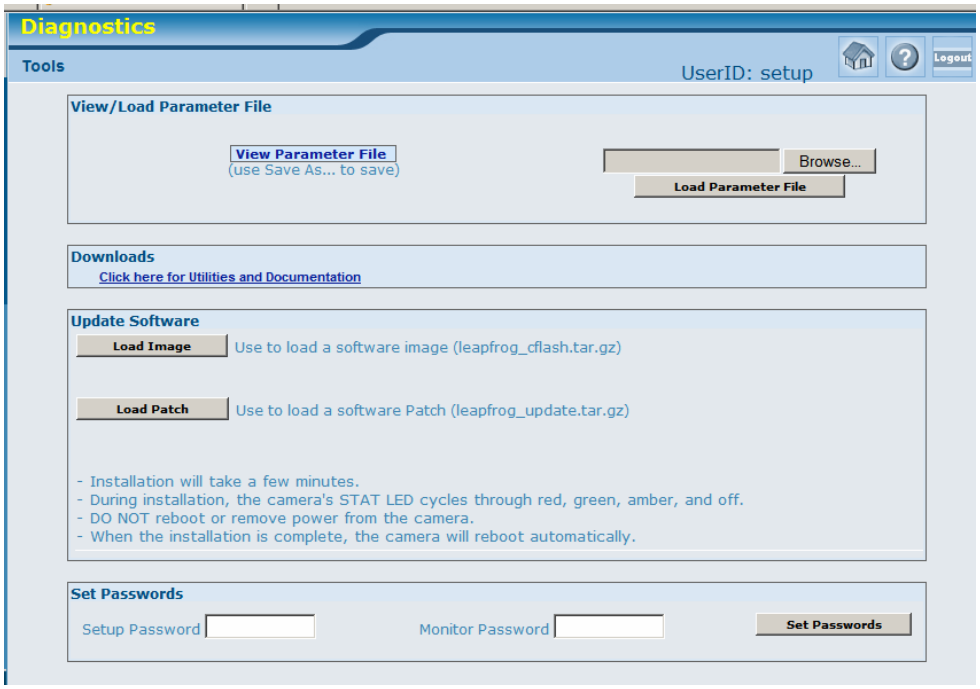
AV6010 Software Version		
00-00-50-41-42-E0	192.168.00.50	SBS-BETA;6.0.7.0

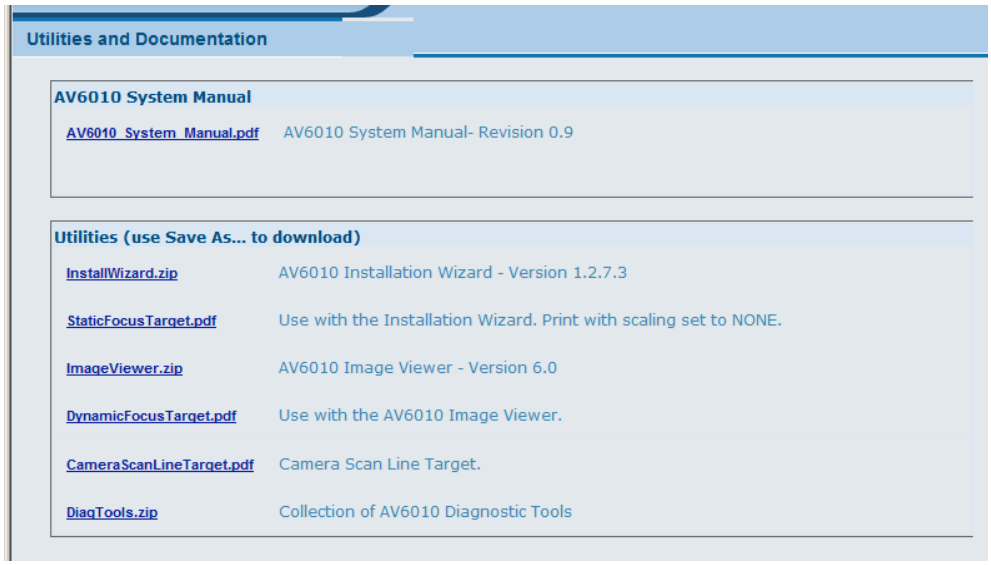
COMe Information	
COMe Slot 1	192.168.0.60
COMe Slot 2	192.168.0.61
COMe Slot 3	Not Present

Peripheral Versions	
iMX31 Revision	5.0.3.1
FPGA Build	10
FPGA ID	01
FPGA Revision	02.02
PIC Build	02
PIC Revision	00.29
PLD Build	03
PLD ID	A0
PLD Revision	00.01
Focus Software Revision	001
Focus Hardware Revision	021
Illumination Software Revision	065535
Illumination Hardware Revision	020

Camera Header Information	
Revision	01
Date	1107
Serial Number	0025410490
Assembly Number	105990
Number of Pixels	8192
Lens Type	140
Far Distance	125
Far DPI	166
Near Distance	066
Near DPI	325

Diagnostics > Tools

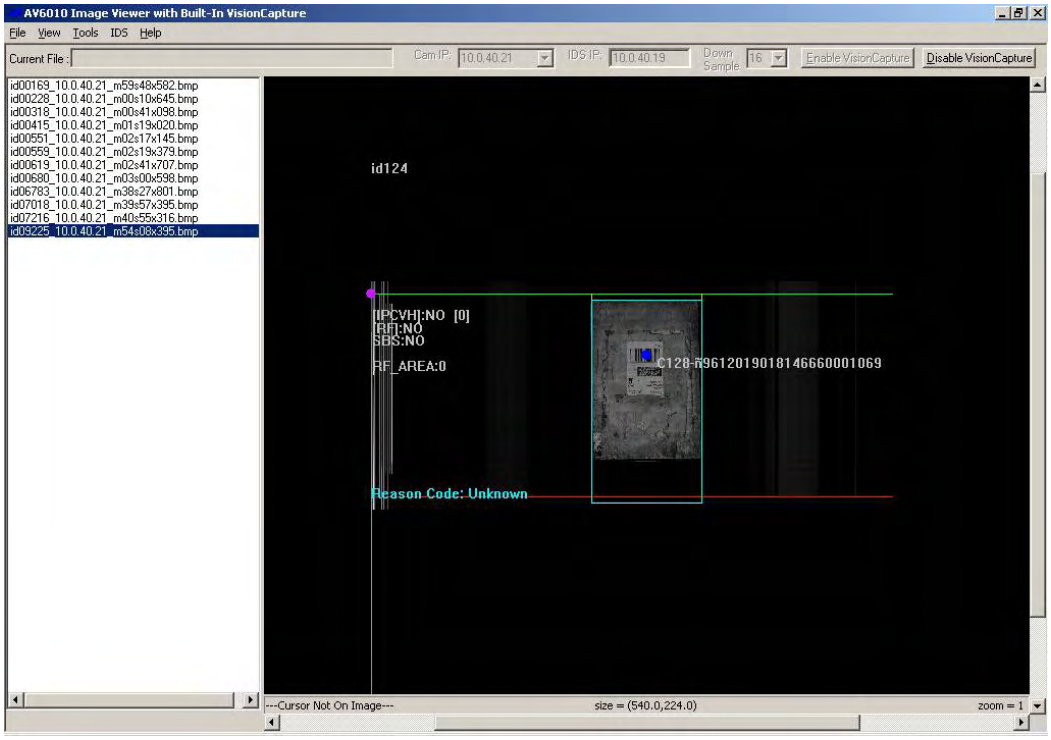




Diagnostics > Tools Descriptions

Selection	Definition
View/Load Parameter File	
View Parameter File	Use to view and/or save the camera system's XML file. In a multiple-camera system, this XML file contains the parameters for all cameras in the system.
Load Parameter File	Use to browse for an XML parameters file saved on your computer and load it to the AV6010 camera system. In a multi-camera system, the XML file contains all the parameters for the entire system.
Downloads (on Utilities and Documentation)	
InstallWizard.zip	Use to download the AV6010 Install Wizard used to calibrate / recalibrate the AV6010 RangeFinder and camera(s).
CameraScanLine Target.pdf	Use to download the Camera Scan Line Target PDF. This target is used with the Install Wizard to determine the distance from the trigger source to camera scan line.
Static FocusTarget.pdf	Use to download the Static Focus Target PDF. This target is used with the Install Wizard during calibration / recalibration.
ImageViewer.zip	Use to download the Image Wizard tool.
Dynamic FocusTarget.pdf	Use to download the Dynamic Focus Target PDF. This target is used with the Image Viewer during calibration / recalibration.
DiagTools.zip	Use to download the Diagnostics Tools (i.e., Camera Image Viewer, Codeword Viewer and Ranger OScope)
	<Need to add the Dimensioning barcodes PDF for ASIDIM and ASICAL.>
Set Passwords	
Setup Password	Assign a new password for users that will have access to the setup features of the system.
Monitor Password	Assign a new password for users that will have access to the monitoring capabilities of the system.
Set Passwords	Click to set the new Setup and Monitor passwords.
Update Software	
Load Image	
Load Patch	

Camera Image Viewer

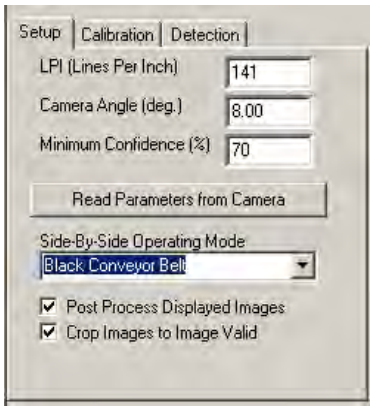


Camera Image Viewer Screen

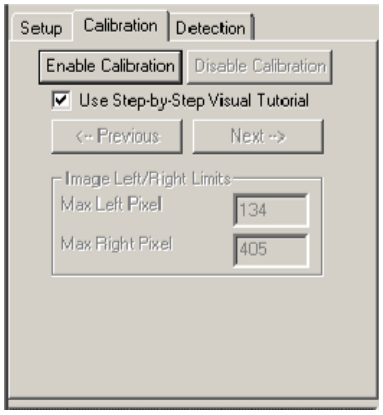
The **Camera Image Viewer** is an installation and diagnostics tool. It is used by trained and authorized Accu-Sort technicians for the initial setup and calibration of camera systems. It is also used for side-by-side package detection setup and calibration.

Camera Image Viewer and SBS Package Detection Tabs

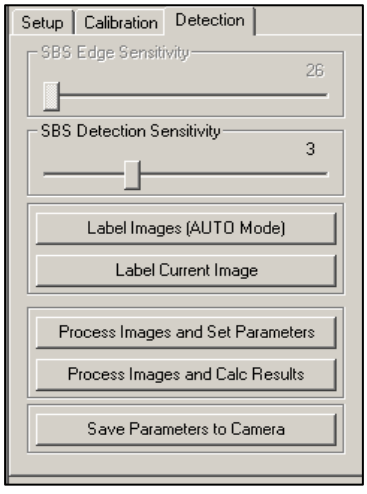
When SBS is enabled, the following tabs are provided:



The **Setup** tab is used to retrieve parameters from the camera and set the transport type used with the SBS-enabled system.

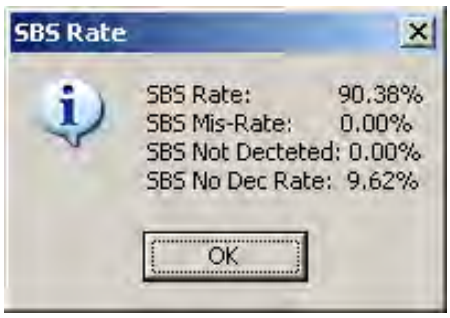


The **Calibration** tab changes based on the transport type selected (belt or tilt-tray).



The **Detection** tab is used to optimize the SBS conditions that the system uses for side-by-side package detection. The image evaluation does not include SBS conditions detected by the RangeFinder or identified by the ignore codes.

Understanding the SBS Rate



- **SBS Rate –** The confidence of the SBS software identifying the parcel correctly
- **SBS Mis-Rate –** Likelihood that the SBS software could mis-label an object
- **SBS Not Detected –** Percentage of images evaluated that the SBS software did not detect as a SBS condition
- **SBS No Dec Rate –** Percentage of images that the SBS software was unable to determine a SBS condition

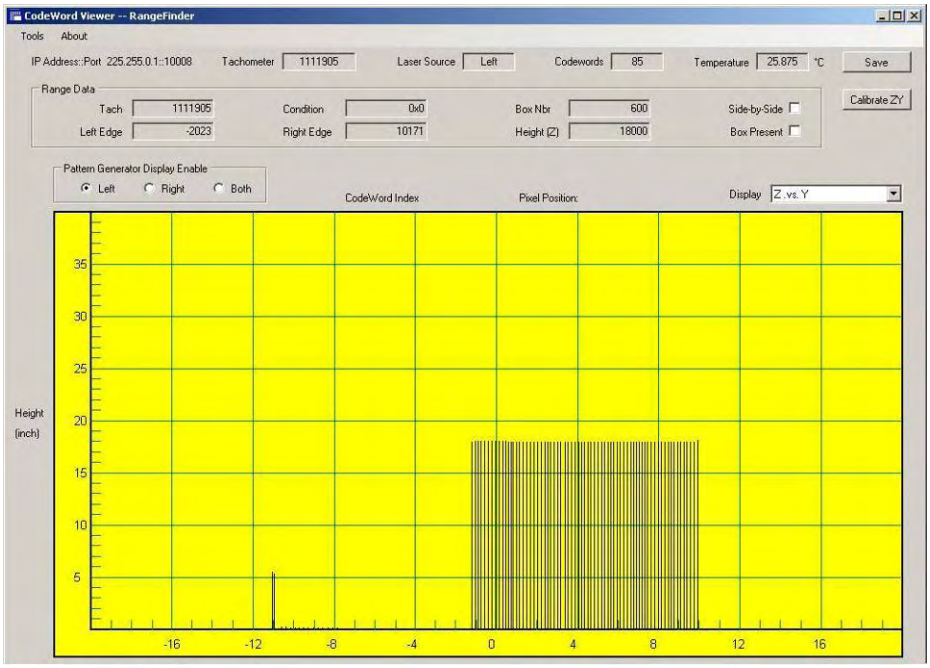
SBS Optimization Folders

During image evaluation and optimization, the viewer processes captured images and determines whether those images identify a side-by-side (SBS) condition. It automatically creates these folders:

- **SBS_DetectedImages** – Correct SBS evaluation.
- **SBS_NotDectectedImages** (False negatives) – Images manually determined to be SBS but considered to be NOT SBS with the optimized parameter settings.
- **SBS_MisDetectImages** (False positives) – Images manually determined to be NOT SBS but considered to be SBS with the optimized parameter settings.
- **SBS_NoDecisionImages** – Images where a decision could not be made.

  NOTE: A folder is not created in cases where NONE of that type of condition occurred.

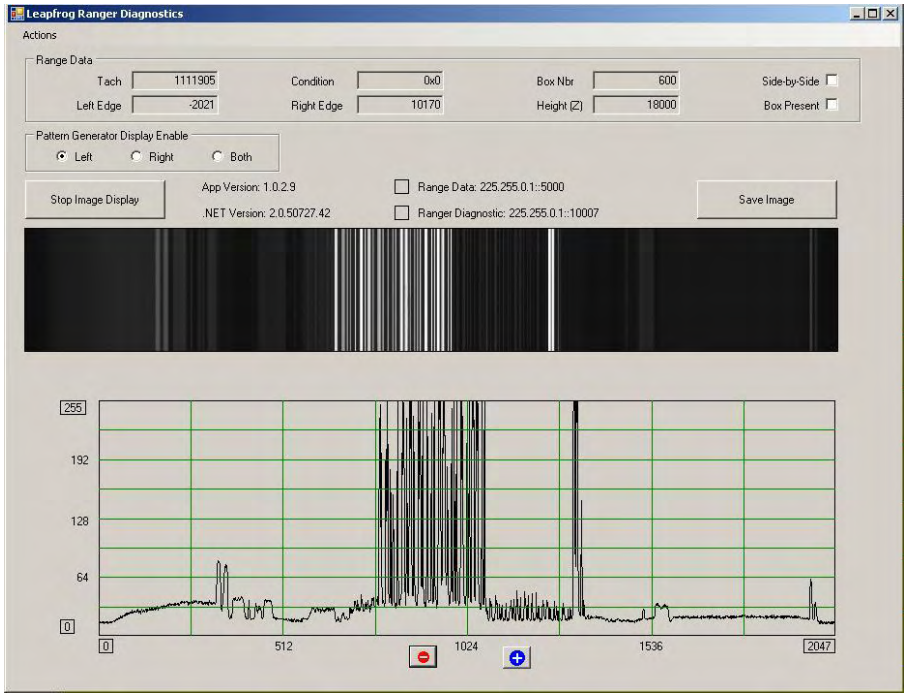
RangeFinder Codeword Viewer



RangeFinder Codeword Viewer Screen

[Details not available at time of publication.]

RangeFinder O-Scope Viewer



RangeFinder O-Scope Viewer Screen

[Details not available at time of publication.]

AV6010 Install Wizard

Use the AV6010 Install Wizard to:

- Auto-calibrate the following system components:
  - RangeFinder
  - Optional package induction (e.g., photoeye, light curtain)
  - Camera(s)
- Dynamically test system calibration
- Verify with actual product

This appendix provides screens and useful reference information related to the AV6010 Install Wizard.

IMPORTANT: Step-by-step procedures are provided in *Chapter 5*.

AV6010 Installation Wizards

Icon	Wizard	Description
	RangeFinder	Use to calibrate the RangeFinder's height above conveyor surface and region of interest.
	Photoeye	In fixed focus applications, use the wizard to enter the distance from the photoeye to where the camera's scanline meets the conveyor. If the photoeye is used in conjunction with a light curtain or RangeFinder, use the wizard to enter the distance from the photoeye to the light curtain or RangeFinder.
	Light Curtain	Use to set the offset from the surface of the conveyor to the bottom of the light curtain's LED array.
	Front Camera	Use with cameras that will only be reading codes on the front of products as the pass through the scanning area. Calibrates key dimensions/angle used to control camera focusing.
	Top Camera	Use with cameras that will only be reading codes on the top of products as the pass through the scanning area. Calibrates key dimensions/angle used to control camera focusing.
	Back Camera	Use with cameras that will only be reading codes on the back of products as the pass through the scanning area. Calibrates key dimensions/angle used to control camera focusing.
	Left Camera	Use with cameras reading codes on the left side of products. Calibrates near, far and focus distance.
	Right Camera	Use with cameras reading codes on the right side of products. Calibrates near, far and focus distance.
	Bottom Camera	Use to calibrate a camera installed to read the bottoms of packages.
	Tunnel	Use to confirm proper calibration of all devices in the system by running the conveyor and sending the calibration boxes through the scanning area. *(Future functionality.)*
	Verify	Use after all system calibration is complete, including the Tunnel wizard, to verify proper operation with actual product to be scanned by the system. *(Future functionality.)*

AV6010 Install Wizards (Quadrant Scanning)

	Front-Left Camera	Use to setup camera that is reading codes on the front and left side of packages in a quadrant application.
	Front-Right Camera	Use to setup camera that is reading codes on the front and right side of packages in a quadrant application.
	Back-Left Camera	Use to setup camera that is reading codes on the back and left side of packages in a quadrant application.
	Back-Right Camera	Use to setup camera that is reading codes on the back and right side of packages in a quadrant application.

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Notes:

C AV6010 and VisionCapture™

The AccuVision® VisionCapture™ Image Capture System uses a Linux-based AV4000$^{2.0}$ Image Depot Server (IDS) to capture images from up to six AV6010 cameras. Captured images are stored on the IDS for offline review, analysis, storage and retrieval.

Use the images to optimize an AV6010 camera systems by:

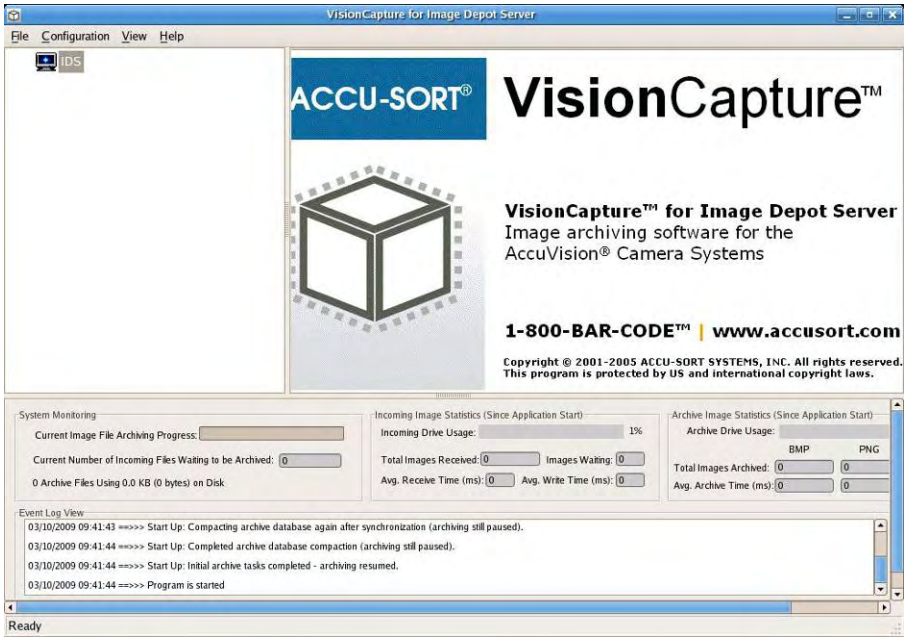
- Identifying root causes that contribute to no-reads
- Store and manage images, image directories, and subfolders
- Access images offline for review and analysis – locally or remotely
- Quickly diagnose potential revenue recovery opportunities

The VisionCapture system connects to the AV6010's **IMAGE** network as outlined in Chapter 3 and Appendix I (drawing 112753, sheet 3).

VisionCapture™ Interface

VisionCapture Icon

***VisionCapture*, a browser-**based user interface, lets you easily setup or modify image file compression and storage management parameters.



With the *VisionCapture Interface*, you can:

- Monitor IDS connections by unique camera name / IP address
- View image information for each captured image
- Define storage management parameters
- Check percentage of hard drive filled, at-a-glance
- Select image save-as mode
  (compressed JPG or PNG, uncompressed BMP)
- View and/or save Event Logs

MultiViewer™ Software

MultiViewer Icon

MultiViewer™ is a flexible tool you will use to work with saved images stored on the Image Depot Server or archived to DVD. The MultiViewer application resides on the IDS. Users can also Remote Desktop into MultiViewer on the IDS from a Windows-based computer.

MultiViewer is available on the Image Depot Server and can be accessed using the monitor/keyboard option. It can also be run on any Windows-based PC connected to your network. Use MultiViewer to perform the following:

- view and analyze images
- sort images
- backup/archive images

MultiViewer supports compressed JPG and Portable Network Graphic (PNG) as well as uncompressed Bitmap (BMP) image formats. Unlike regular BMP or PNG files, image files saved in IDS contain additional information related to the captured images including an image ID number and start / stop scan line time stamp.

The extra data is embedded in the BMP or PNG files without destroying the file format. When using regular Windows-based image viewers to look at image files saved by VisionCapture (e.g., Image Edit, Internet Explorer), the extra information is ignored. The MultiViewer application is designed to display the useful embedded information in the image window.

IMPORTANT: Step-by-step procedures are provided in the ***AccuVision VisionCapture Image Capture System Manual***.

D AV6010 and FAST Monitor

FAST Monitor is a browser-based application that gives facility managers and maintenance personnel the ability to monitor multiple Accu-Sort products within their facility or across multiple facilities from anywhere an internet connection is available. FAST Monitor provides real-time and historical performance data in an easy-to-use interface as well as automatic status and error condition reporting of all Accu-Sort products and systems to which it is connected.

The AV6010 Camera System is fully compatible with the FAST Monitor Server and application.

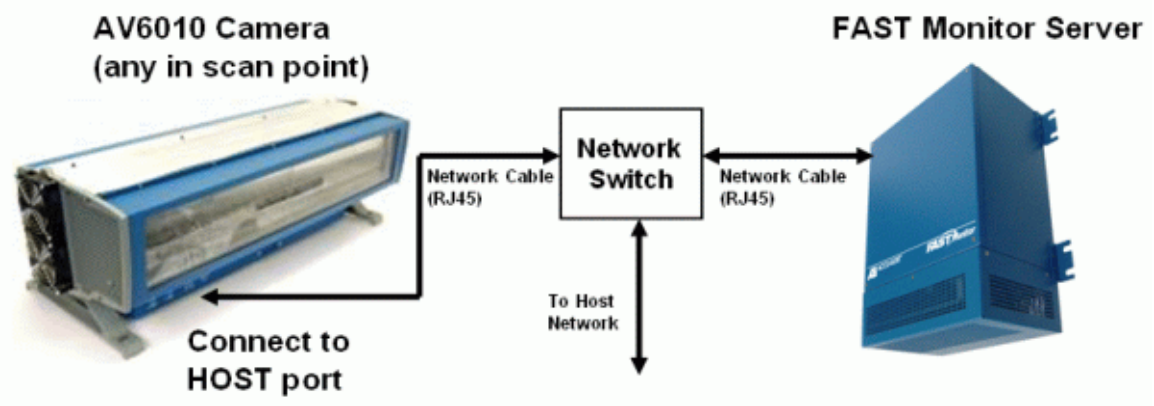
Prerequisites:

- FAST Monitor Server and software (version 1.2.12.3 or later)
- Internet connection
- RJ45 Ethernet cable

To connect an AV6010 camera or tunnel to a FAST Monitor Server:

1. Run an RJ45 Ethernet cable connection via a network switch from the **HOST** RJ45 port of the AV6010 Camera to the FAST Monitor Server Ethernet port.

NOTE: In multiple-camera systems, this connection can be made to any camera in the same SYNC network. It does not need to be made to the 'controller camera'.



2. Login to the AV6010 User Interface as a **Setup** user.
3. Select **Setup > Communications (camera) > Host Network > Network** from the menu tree. The 'camera' you choose should be the camera that is connected to the FAST Monitor server. The **Network** window opens.

NOTE: Jot down the camera's IP address as shown in the **Static Network Settings** section of the **Network** window. This IP is required when setting up the connection to the AV6010 camera in the FAST Monitor User Interface.

4. Add the FAST Monitor server to the next available Host Port in the **Host Network Connection** section of the **Network** window.
5. Select **Fast Monitor** from the Host Port(n) drop-down list.
6. Type the IP address of the FAST Monitor server in the IP input field.

NOTE: The default IP for the FAST Monitor server is 192.168.250.1. If this IP does not work, contact Accu-Sort support at 1-800-BAR-CODE.

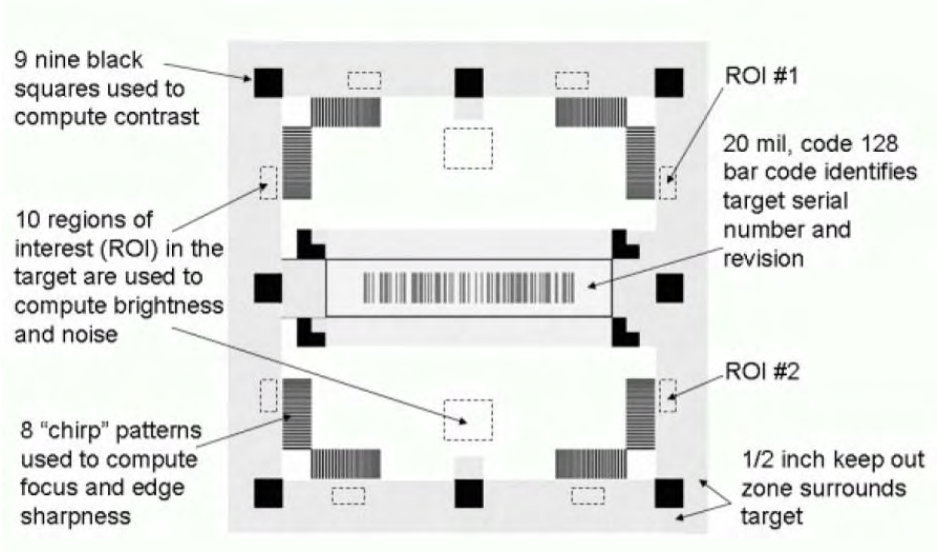
7. Type 9899 in the Port # input field.
8. Click **Update**.

For additional information on setting up the FAST Monitor Server to connect to an AV6010 Tunnel, see the ***FAST Monitor User Guide***.

E Image Quality Analysis (IQA)

IQA Overview

The Image Quality Analysis (IQA) tool is an optional component of a camera's software package (a shared library or DLL). It resides in each camera and is executed on-demand when a camera detects the presence of a "special" Accu-Sort IQA trigger bar code. The IQA trigger bar code is applied to, or is part of, an Accu-Sort IQA test target. An IQA test target is attached to all sides of a calibration box.



Example of an IQA Test Target with IQA Trigger Bar Code

WARNING: Do not mark, damage or otherwise obstruct the IQA target or 0.5-inch *"keep out" zone* surrounding the IQA target bar codes.

During initial system commissioning and as part of a periodic maintenance event (pre or post sort) a calibration box is conveyed through a tunnel (scan point) and each camera's quality metrics are measured. The metrics include focus, brightness, contrast, and noise. The results of these measurements are sent to a FAST Monitor (FM) server where they are formatted for display.

IQA results can be used to determine if a tunnel's or camera's performance has degraded to the point where it may affect bar code decoding or RIE/OCR results.

If available under your software license, IQA statistic information can be enabled in FAST Monitor by selecting the IQA checkbox in **Global Administration / Security / Privilege Mgmt.** IQA statistics will then be displayed with other camera statistics.

For more information, see the **FAST Monitor User Guide**.

CAUTION: It is recommended that this procedure be performed by an Accu-Sort Trained and Authorized Technician. On-site service, training, and technical support is available from Accu-Sort. For more information, contact Customer Service at 1-800-BAR-CODE.

Prerequisites:

- Calibration box (12-inch cubic box, plywood recommended)
- IQA test targets
- Camera system connected to FAST Monitor

IMPORTANT: The IQA target bar codes supplied by Accu-Sort have unique serialization and should not be reproduced. Plywood calibration boxes are also available from Accu-Sort. For additional targets or plywood calibration boxes, contact your Accu-Sort sales or service representative at 1-800-BAR-CODE.

To test a camera's image quality with IQA:

1. Affix the 8-inch square targets (supplied by Accu-Sort) to a 12-inch cubic box (plywood recommended). The targets should be:
    a. Centered in the box faces.
    b. One IQA target per box face.
2. During a non-sort period, manually induct the IQA calibration box into the tunnel keeping the box skew to less than 10 degrees.
3. The camera(s) will read the IQA target(s) and return performance data to FAST Monitor.

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Notes:

F Error Codes

Overview

You can view the AV6010 error codes in one of the following ways:

- **Diagnostics > RangeFinder Status**
- **Diagnostics > Camera Status** *(by camera location)*
- Optional FAST Monitor System

The error codes are identified by 4-digit series numbers and are provided in the following tables:

- 1000: Software Critical Errors
- 2000: Software Serious Errors
- 3000: System Errors
- 4000: COMe Errors
- 5000: Focus and Illumination Errors
- 6000: RangeFinder Errors

The error code severity is identified as one of the following:

- Info
- Warning *(Status LED blinking)*
- Error *(Status LED solid 'ON')*

NOTE: This appendix includes all error codes for version 8.x of the AV6010 software including dimensioning. Older versions of AV6010 software will not include all the error codes provided in this appendix.

Software Error Codes

Error Code	Description

Software Critical Errors

1001-1034	SW Init Failure: xxxxxxxx
Note:	Because the system did not boot, these errors are not displayed on the user interface nor do they appear in the debug log. Normal course of action is rebooting the system.

Software Serious Errors

2001	Info: Unable to set 'Send Socket' buffer size
2002	Info: Unable to set 'Receive Socket' buffer size
2003	Info: Unable to write to socket
2004	Info: Unable to read from socket
2005	Info: Unable to write to message queue
2006	Info: Unable to read from message queue
2007	Info: Unable to stop FTP Server
2008	Info: Unable to stop TFTP Server
2009	Info: Unable to stop DHCP Server
2010	Info: Unable to disable port of network switch
2011	Info: Unable to create VLAN in network switch
2012	Info: Unable to assign static IP to SYNC network
2013	Info: Unable to assign static IP to IMAGE network
2014	Info: Unable to assign static IP to HOST network
2015	Info: Unable to start DHCP client on SYNC network
2016	Info: Unable to start DHCP client on IMAGE network
2017	Info: Unable to start DHCP client on HOST network
2018	Info: Unable to assign netmask to SYNC network
2019	Info: Unable to assign netmask to IMAGE network
2020	Info: Unable to assign netmask to HOST network
2021	Info: Unable to assign gateway to SYNC network
2022	Info: Unable to assign gateway to IMAGE network

2023	Info: Unable to assign gateway to HOST network
2024	Info: Unlinking message queue failed
2025	Info: Closing shared memory failed
2026	Info: Closing semaphore failed
2027	Info: Unmapping shared memory failed
2028	Info: Unlinking semaphore failed
2029	Info: Invalid argument to mq Read/Write
2030	Info: Invalid argument to mq Read/Write
2031	Info: Read on FPGA device failed
2032	Info: Write to FPGA device failed
2033	Info: Could not TFTP file
2034	Info:: Error In validating config file
2035	Info: Socket address cannot be reused
2036	Info: Listen on socket failed
2037	Info: Accept connection on socket failed
2038	Info: Socket connection failure
2039	Info: SYNC network not connected to loop
2040	Info: Unable to connect to FastMonitor

AV6010 Camera System

Error Code	Description	Status LED	Severity
System Errors			
3001	Warning: No response (TFTP ack) from COMe #1.	Blink Red	Warning
3002	Warning: No response (TFTP ack) from COMe #2.	Blink Red	Warning
3003	Warning: No response (TFTP ack) from COMe #3.	Blink Red	Warning
3004	Warning: No response (Release IP ack) from Decoder (COMe) #1.	Blink Red	Warning
3005	Warning: No response (Release IP ack) from Decoder (COMe) #2.	Blink Red	Warning
3006	Warning: No response (Release IP ack) from Decoder (COMe) #3.	Blink Red	Warning
3007	Communication with COMe #1 lost.	Solid Red	Error
3008	Communication with COMe #2 lost.	Solid Red	Error
3009	Communication with COMe #3 lost.	Solid Red	Error
3010	More than maximum allowed COMe modules detected.	Solid Red	Error
3011	Camera Control Processor (iMX31) failed to boot.	Solid Red	Error
3012	Communication with Camera Control Processor (iMX31) lost.	Solid Red	Error
3013	Invalid packet received over serial/Ethernet link.	--	Info
3014	Failure in configuration internal network switch.	Solid Red	Error
3015	Unable to load and start the FPGA.	Solid Red	Error
3016	Info: Maximum bar codes for a package exceeded.	--	Info
3017	Transmit point interrupt error.	Solid Red	Error
3018	Info: Bar code data received too late.	--	Info
3019	Invalid bar code data received from decoder.	--	Info
3020	Package database was empty.	--	Info
3021	Bar code data received for 'missing package'.	--	Info
3022	Bar code data does not match any enabled type.	--	Info
3023	Package less than min package size detected.	--	Info
3024	Warning: Belt speed detected by all cameras does not match.	Blink Red	Warning
3025	Warning: More than maximum allowed cameras detected.	Blink Red	Warning
3026	Warning: Camera with the same name detected.	Blink Red	Warning

3027	Warning: Communication with Left-Front Camera lost	Blink Red	Error
3028	Warning: Communication with Right-Front Camera lost	Blink Red	Error
3029	Warning: Communication with Left-Back Camera lost	Blink Red	Error
3030	Warning: Communication with Right-Back Camera lost	Blink Red	Error
3031	Warning: Communication with Top Camera lost	Blink Red	Error
3032	Warning: Communication with Left Camera lost	Blink Red	Error
3033	Warning: Communication with Right Camera lost	Blink Red	Error
3034	Warning: Communication with Back Camera lost	Blink Red	Error
3035	Warning: Communication with Front Camera lost	Blink Red	Error
3036	Warning: Communication with Bottom Camera lost	Blink Red	Error
3037	Warning: Communication with RangeFinder lost	Blink Red	Error
3038	Info: Start Trigger from RangeFinder missed	--	Info
3039	Info: Start/End Trigger from RangeFinder missed	--	Info
3040	Info: Start Trigger from Camera missed	--	Info
3041	Warning: No response (Config param ack) from RangeFinder	Blink Red	Warning
3042	Warning: Failure in merging configuration files	Blink Red	Warning
3043	Warning: Failure when TFTPing configuration file	Blink Red	Warning
3044	No free 'CAM Entry' In config file	Solid Red	Error
3045	Warning: Current Tach greater than transmit point tach	Blink Red	Warning
3046	Failure when deleting all nodes in config file	Blink Red	Warning
3047	Right side fan disconnected or failed	Solid Red	Error
3048	Left side fan disconnected or failed	Solid Red	Error
3049	Warning: Right side fan at reduced speed	Blink Red	Warning
3050	Warning: Left side fan at reduced speed	Blink Red	Warning
3051	Error: FPGA PCIe link is at less than 8x	Solid Red	Error

COMe #1 Errors

4000	Error: COMe unable to multicast decode results	Solid Red	Error
4001	Error: COMe unable to create multicast socket	Solid Red	Error
4002	Error: COMe unable to create host message queue	Solid Red	Error
4003	Error: COMe unable to create decode message queue	Solid Red	Error
4004	Error: COMe unable to create decode message queue	Solid Red	Error
4005	Error: COMe unable to verify decode engine version	Solid Red	Error
4006	Error: COMe detected a problem while decoding	Solid Red	Error
4007	Error: COMe detected an error with the image buffer	Solid Red	Error
4008	Error: COMe unable to open the PCIe driver	Solid Red	Error
4009	Error: COMe unable to attached to mapped memory	Solid Red	Error
4010	*[Unassigned]*		
4011	Info: COMe started dimensioning	--	Info
4012	Info: COMe restarted dimensioning software	--	Info
4013	Info: COMe received parameter update	--	Info
4014	Info: COMe started decoding software	--	Info
4015	Info: COMe restarted decoding software	--	Info
4016	Error: COMe Rangefinder Ver/CRC Failure	Solid Red	Error
4017	Error: COMe status monitor AATM failure	Solid Red	Error
4018	Error: COMe Dimensioner AATM failure	Solid Red	Error
4019	Error: COMe AATM Ver/CRC mismatch	Solid Red	Error
4020	Error: COMe Parameter CRC failure	Solid Red	Error
4021	Error: COMe unable to retrieve parameters	Solid Red	Error
4022	Error: COMe dimensioning token mismatch	Solid Red	Warning
4023	Error: COMe unable to allocate buffer for image	Solid Red	Error
4024	Error: COMe failed during app initialization	Solid Red	Error
4025	Info: Dimensioning NOT Ready	--	Info
4026	Info: Dimensioning Ready	--	Info
4027	Info: Rangefinder Not Ready for Dimensioning	--	Info
4028	Warning: Dim Verification Failure	Blink Red	Warning

4029	Error: ImgBuffHandler Ver/CRC Failure	Solid Red	Error
4030	Error: Dimension Lib Ver/CRC Failure	Solid Red	Error
4031	Info: CERT Mode Off	--	Info
4032	Info: RFU 1	--	Info
4033	Info: RFU 2	--	Info
4034	Info: RFU 3	--	Info
4035	Info: RFU 4	--	Info
4036	Info: RFU 5	--	Info
4037	Info: COMe started Raw Image Export	--	Info
4038	Info: COMe restarted Raw Image Export	--	Info

COMe #2 Errors

4300	Error: COMe unable to multicast decode results	Solid Red	Error
4301	Error: COMe unable to create multicast socket	Solid Red	Error
4302	Error: COMe unable to create host message queue	Solid Red	Error
4303	Error: COMe unable to create decode message queue	Solid Red	Error
4304	Error: COMe unable to create decode message queue	Solid Red	Error
4305	Error: COMe unable to verify decode engine version	Solid Red	Error
4306	Error: COMe detected a problem while decoding	Solid Red	Error
4307	Error: COMe detected an error with the image buffer	Solid Red	Error
4308	Error: COMe unable to open the PCIe driver	Solid Red	Error
4309	Error: COMe unable to attached to mapped memory	Solid Red	Error
4310	*[Unassigned]*		
4311	Info: COMe started dimensioning	--	Info
4312	Info: COMe restarted dimensioning software	--	Info
4313	Info: COMe received parameter update	--	Info
4314	Info: COMe started decoding software	--	Info
4315	Info: COMe restarted decoding software	--	Info
4316	Error: COMe Rangefinder Ver/CRC Failure	Solid Red	Error
4317	Error: COMe status monitor AATM failure	Solid Red	Error

4318	Error: COMe Dimensioner AATM failure	Solid Red	Error
4319	Error: COMe AATM Ver/CRC mismatch	Solid Red	Error
4320	Error: COMe Parameter CRC failure	Solid Red	Error
4321	Error: COMe unable to retrieve parameters	Solid Red	Error
4322	Error: COMe dimensioning token mismatch	Solid Red	Warning
4323	Error: COMe unable to allocate buffer for image	Solid Red	Error
4324	Error: COMe failed during app initialization	Solid Red	Error
4325	Info: Dimensioning NOT Ready	--	Info
4326	Info: Dimensioning Ready	--	Info
4327	Info: Rangefinder Not Ready for Dimensioning	--	Info
4328	Warning: Dim Verification Failure	Blink Red	Warning
4329	Error: ImgBuffHandler Ver/CRC Failure	Solid Red	Error
4330	Error: Dimension Lib Ver/CRC Failure	Solid Red	Error
4331	Info: CERT Mode Off	--	Info
4332	Info: RFU 1	--	Info
4333	Info: RFU 2	--	Info
4334	Info: RFU 3	--	Info
4335	Info: RFU 4	--	Info
4336	Info: RFU 5	--	Info
4337	Info: COMe started Raw Image Export	--	Info
4338	Info: COMe restarted Raw Image Export	--	Info

COMe #3 Errors

4600	Error: COMe unable to multicast decode results	Solid Red	Error
4601	Error: COMe unable to create multicast socket	Solid Red	Error
4602	Error: COMe unable to create host message queue	Solid Red	Error
4603	Error: COMe unable to create decode message queue	Solid Red	Error
4604	Error: COMe unable to create decode message queue	Solid Red	Error
4605	Error: COMe unable to verify decode engine version	Solid Red	Error
4606	Error: COMe detected a problem while decoding	Solid Red	Error
4607	Error: COMe detected an error with the image buffer	Solid Red	Error

4608	Error: COMe unable to open the PCIe driver	Solid Red	Error
4609	Error: COMe unable to attached to mapped memory	Solid Red	Error
4610	*[Unassigned]*		
4611	Info: COMe started dimensioning	--	Info
4612	Info: COMe restarted dimensioning software	--	Info
4613	Info: COMe received parameter update	--	Info
4614	Info: COMe started decoding software	--	Info
4615	Info: COMe restarted decoding software	--	Info
4616	Error: COMe Rangefinder Ver/CRC Failure	Solid Red	Error
4617	Error: COMe status monitor AATM failure	Solid Red	Error
4618	Error: COMe Dimensioner AATM failure	Solid Red	Error
4619	Error: COMe AATM Ver/CRC mismatch	Solid Red	Error
4620	Error: COMe Parameter CRC failure	Solid Red	Error
4621	Error: COMe unable to retrieve parameters	Solid Red	Error
4622	Error: COMe dimensioning token mismatch	Solid Red	Warning
4623	Error: COMe unable to allocate buffer for image	Solid Red	Error
4624	Error: COMe failed during app initialization	Solid Red	Error
4625	Info: Dimensioning NOT Ready	--	Info
4626	Info: Dimensioning Ready	--	Info
4627	Info: Rangefinder Not Ready for Dimensioning	--	Info
4628	Warning: Dim Verification Failure	Blink Red	Warning
4629	Error: ImgBuffHandler Ver/CRC Failure	Solid Red	Error
4630	Error: Dimension Lib Ver/CRC Failure	Solid Red	Error
4631	Info: CERT Mode Off	--	Info
4632	Info: RFU 1	--	Info
4633	Info: RFU 2	--	Info
4634	Info: RFU 3	--	Info
4635	Info: RFU 4	--	Info
4636	Info: RFU 5	--	Info
4637	Info: COMe started Raw Image Export	--	Info
4638	Info: COMe restarted Raw Image Export	--	Info

Focus and Illumination Errors

5000	Error: Focus Servo coil is locked	Solid Red	Error
5001	Error: Focus Servo PWM over limit	Solid Red	Error
5002	Error: Focus Servo PWM time-out	Solid Red	Error
5003	Error: CRC Error on Focus Servo parameters	Solid Red	Error
5004	Error: Focus Servo detected 'Bad Stops'	Solid Red	Error
5005	Info: Unable to transmit Focus Servo	--	Info
5006	Error: Focus Servo not responding	Solid Red	Error
5007	Info: Invalid packet received from Focus Servo	--	Info
5008	Info: Invalid command received from Focus Servo	--	Info
5009	Warning: LED Board 0 near end of life	Blink Red	Warning
5010	Warning: LED Board 1 near end of life	Blink Red	Warning
5011	Warning: LED Board 2 near end of life	Blink Red	Warning
5012	Warning: LED Board 3 near end of life	Blink Red	Warning
5013	Warning: LED Board 4 near end of life	Blink Red	Warning
5014	Warning: LED Board 5 near end of life	Blink Red	Warning
5015	Error: Failure of LED Board 0	Solid Red	Error
5016	Error: Failure of LED Board 1	Solid Red	Error
5017	Error: Failure of LED Board 2	Solid Red	Error
5018	Error: Failure of LED Board 3	Solid Red	Error
5019	Error: Failure of LED Board 4	Solid Red	Error
5020	Error: Failure of LED Board 5	Solid Red	Error
5021	Error: LED Board 0 CRC check failed	Solid Red	Error
5022	Error: LED Board 1 CRC check failed	Solid Red	Error
5023	Error: LED Board 2 CRC check failed	Solid Red	Error
5024	Error: LED Board 3 CRC check failed	Solid Red	Error
5025	Error: LED Board 4 CRC check failed	Solid Red	Error
5026	Error: LED Board 5 CRC check failed	Solid Red	Error
5027	Info: Unable to transmit to Illumination	--	Info
5028	Error: Illumination Controller not responding	Solid Red	Error

5029	Info: Invalid packet received from Illumination	--	Info
5030	Info: Invalid command received from Illumination	--	Info
5031	Info: Belt or Tachometer stopped	--	Info
5032	Error: Tach Sync ISR was "Out of Sync"	Blink Red	Warning
5033	Error: Photoeye ISR failure	Blink Red	Warning
5034	Error: Unable to read directory table	Solid Red	Error
5035	Error: Unable to read header table	Solid Red	Error
5036	Error: Unable to read gain table	Solid Red	Error
5037	Error: Unable to read focus table	Solid Red	Error
5038	Error: Unable to read gain correction table	Solid Red	Error
5039	Error: Unable to read offset correction table	Solid Red	Error
5040	Info: Invalid start of 'image valid' detected	--	Info
5041	Info: Invalid end of 'image valid' detected	--	Info
5042	Info: Invalid 'image valid' state detected	--	Info
5043	Error: Sensor Board I2C communication failure	Solid Red	Error
5044	Info: Attempt to focus beyond maximum range	--	Info
5045	Info: Attempt to focus below minimum range	--	Info
5046	Error: Unable to load gain table (invalid table)	Solid Red	Error
5047	Unable to load focus table (invalid table)	Solid Red	Error
5048	Info: Invalid Height from RangeFinder	--	Info
5049	Info: Invalid Left Position from RangeFinder	--	Info
5050	Info: Invalid Right Position from RangeFinder	--	Info

AV6010 RangeFinder

Error Code	Description	Status LED (RangeFinder)	Severity
6000	Error: Image Sensor Read Failure	Solid Red	Error
6001	Error: Sensor data always from DOE #1	Solid Red	Error
6002	Error: Sensor data always from DOE #2	Solid Red	Error
6003	Error: Laser #1 current exceeds limit	Solid Red	Error
6004	Error: Laser #2 current exceeds limit	Solid Red	Error
6005	Error: Laser #1 temperature exceeds limit	Solid Red	Error
6006	Error: Laser #2 temperature exceeds limit	Solid Red	Error
6007	Error: No valid temperature for laser #1	Solid Red	Error
6008	Error: No valid temperature for laser #2	Solid Red	Error
6009	Error: Tach or Tach Sync problem (invalid speed)	Solid Red	Error
6010	Error: Sensor or laser problem (no codewords)	Solid Red	Error
6011	Error: CERT accuracy exceeds calibration	Solid Red	Error
6012	Error: Dimensioning not supported	Solid Red	Error
6032	Warning: Laser 1 is off or blocked (no codewords)	Blinking Red	Warning
6033	Warning: Laser 2 is off or blocked (no codewords)	Blinking Red	Warning
6034	Warning: RangeFinder is not level	Blinking Red	Warning
6035	Warning: Object stuck in rangefinder view	Blinking Red	Warning
6036	Warning: Belt Speed is out of valid range	Blinking Red	Warning
6064	Info: Belt or Tachometer stopped	Blinking Green	Info
6065	Info: Waiting to Sync Tachometer	Blinking Green	Info
6066	Info: Calibration for 0.1 inch height	n/a	Info
6067	Info: Calibration for 0.2 inch height	n/a	Info
6068	Info: Calibration for 0.5 inch height	n/a	Info

G Dimensioning

Introducing AV6010 with In-camera Dimensioning

Any bar code reading application using an AV6010 Top Read Camera can also be used for dimensioning non-touching (singulated) packages. If your system is dimensioning-enabled, the top-read camera will be equipped with a DCM that includes the optional dimensioning COM-e module.

There is only a few special hardware or electrical installation requirements for an AV6010 dimensioning application. All of the dimensioning setup and monitoring is handled through the web-browser user interface.

Certified dimensioning applications involve special requirements that are addressed throughout this appendix.

CAUTION: Because of the complexity of the AV6010 Camera System, it is recommended that only authorized and trained service technicians perform set-up, parameter adjustments, changes or FRU part replacement. Special training is required for AV6010 dimensioning systems. Training is available from Accu-Sort. Contact your sales representative or customer service for additional information. Do not attempt to set-up a dimensioning system without proper training or the assistance of Accu-Sort technical support.

Overview

The minimum requirements for using in-camera dimensioning include:

- AV6010 RangeFinder (calibrated for either 0.5, 0.2 or 0.1” accuracy)
- AV6010 Top-Read Camera (with dimensioning-ready DCM)
- Tachometer

If the application is for ***certified dimensioning***, it will also include:

- Laptop computer for remote display and inspection *(customer-supplied) (recommended for all certified dimensioning applications)*
- Remote Display (2 line x 20 character) *(required by Measurement Canada, optional for others)*
- Certified Label on Top Camera and Mounting Structure *(required for all certified dimensioning applications)*
- Top Camera DCM sealed *(required for all certified dimensioning applications)*
- Calibration Seal on Tachometer *(required in Europe, optional for all others)*

Certified Dimensioning Installation Requirements

Top-Read Camera

Top-read cameras used in a certified dimensioning system must have the DCM and camera head compartments properly sealed with a wire certification seal running through the hole in the camera head back cover and DCM latch shown in *Figure G-1*. Additionally, the correct specifications label must be applied to the bottom of the DCM *(Figure G-11 and G-13)*.

Figure G-1: Top-Read Camera with DCM and Camera Head Seal Hole

Remote Display

The recommended remote display is a laptop computer that can be moved between multiple dimensioning systems at one site. After making connection with the camera, the AV6010 user interface *(Figure G-3)* can be used to view system status, camera status and various logs related to dimensioning.

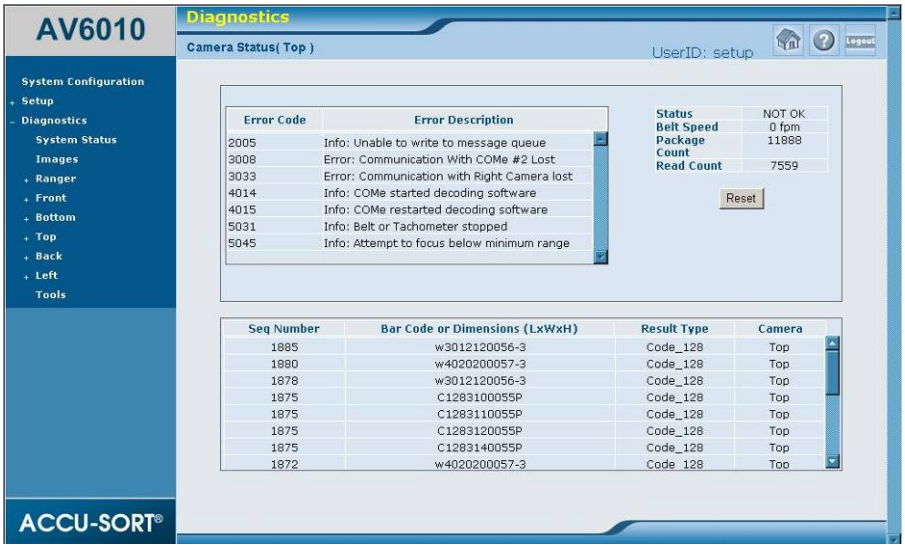


Figure G-3: Remote Display for Certified Dimensioning

Measurement Canada requires a dedicated remote display be located at every dimensioning location within a site and should be mounted for easy visibility. Accu-Sort includes a 2 line by 20 character vacuum fluorescent display for this purpose. It is used to display the certification mode data (box length, width, height) in either inches or millimeters.

Figure G-4: Dedicated Remote Display

AV6010 User Interface Screens related to Dimensioning

When the top-read camera in a system is equipped with dimensioning capabilities, the Dimensioning screen is provided via the web-browser interface. After login, go to **Setup > Advanced > Dimensioning** to view the screen.

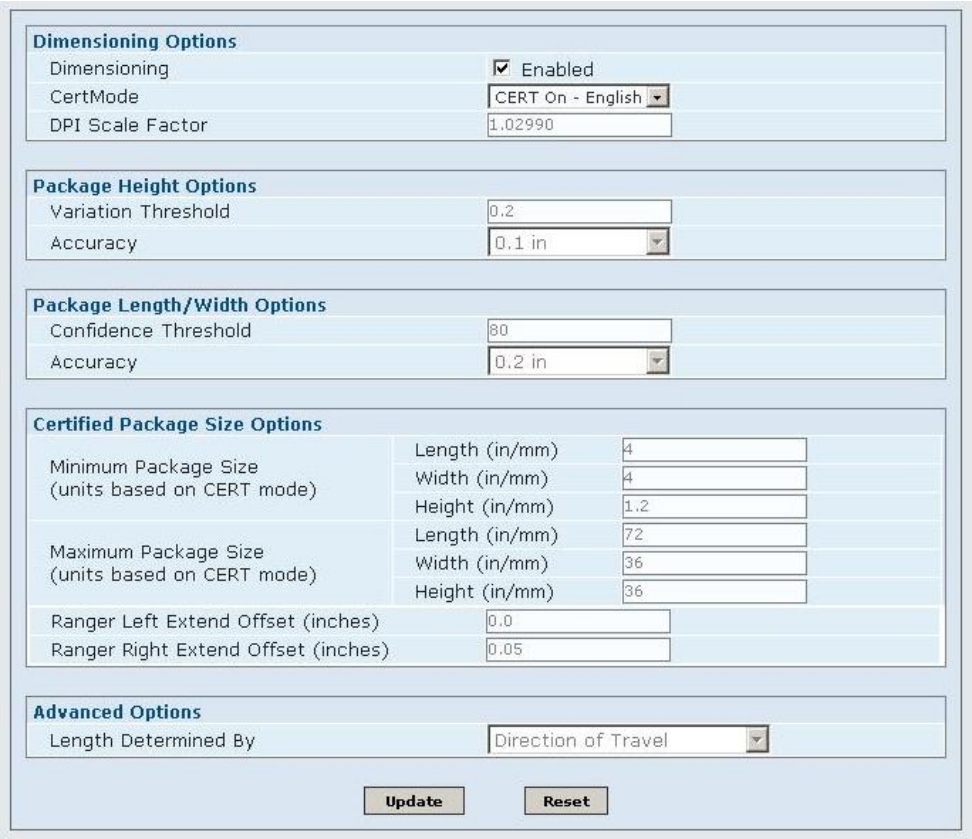


Figure G-5: Dimensioning Screen

Other screens that will require special setup for dimensioning include:

- Tachometer
- Symbologies
- Top Camera Mounting
- Top Camera Imaging

Dimensioning Setup and Calibration procedures are provided in *Chapter 5. For details on the rest of the user interface, reference Appendix B.*

Viewing Dimensioning Data from Top Camera

During normal operations, use the **System Status** screen to check the bar code and dimensioning information being reported by the top-red camera. After login as a Monitor user, go to **Diagnostics > System Status**.

Device	Status
Ranger	OK
Top	OK

Status	OK
Belt Speed	0 fpm
Package Count	9
Read Count	8
Mult Count	0

Reset

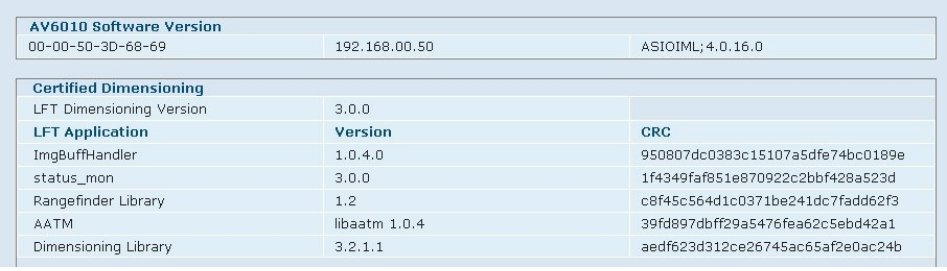
Seq Number	Bar Code or Dimensions (LxWxH)	Result Type	Camera
9	42018969	Code_128	Top
9	1Z901W400335667264	Code_128	Top
9	18969 84003 1Z901W400335667264U	Maxicode	Top
8	1Z0691890330227036	Code_128	Top
8	42018969	Code_128	Top
8	18969 84003 1Z0691890330227036U	Maxicode	Top
7	W060402053-500000000	Code_128	Top
6	W060402053-500000000	Code_128	Top

Figure G-6: System Status Screen showing Dimensioning Data

See also: Audit Trail and Alibi Storage Logs (Figures G-8 and G-9).

Viewing Certified Dimensioning Software Versions

To view the software versions of all legally relevant dimensioning applications, along with their CRC values, login as a Monitor user and go to **Diagnostics > Top > Versions.**



AV6010 Software Version		
00-00-50-3D-68-69	192.168.00.50	ASIOIML;4.0.16.0

Certified Dimensioning		
LFT Dimensioning Version	3.0.0	
LFT Application	**Version**	**CRC**
ImgBuffHandler	1.0.4.0	950807dc0383c15107a5dfe74bc0189e
status_mon	3.0.0	1f4349faf851e870922c2bbf428a523d
Rangefinder Library	1.2	c8f45c564d1c0371be241dc7fadd62f3
AATM	libaatm 1.0.4	39fd897dbff29a5476fea62c5ebd42a1
Dimensioning Library	3.2.1.1	aedf623d312ce26745ac65af2e0ac24b

Figure G-7: Dimensioning Software Versions

Audit Trail and Alibi Storage Logs

The Audit Trail and Alibi Storage Logs are only accessible from the top-read camera of an AV6010 system with dimensioning.

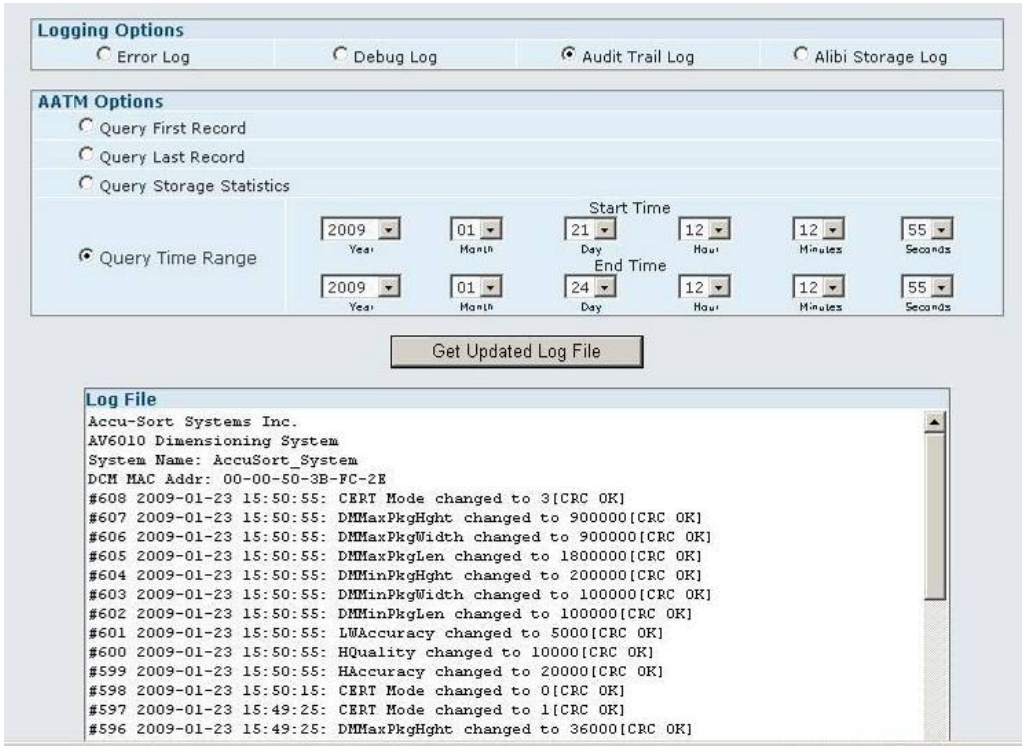


Figure G-8: Audit Trail Log

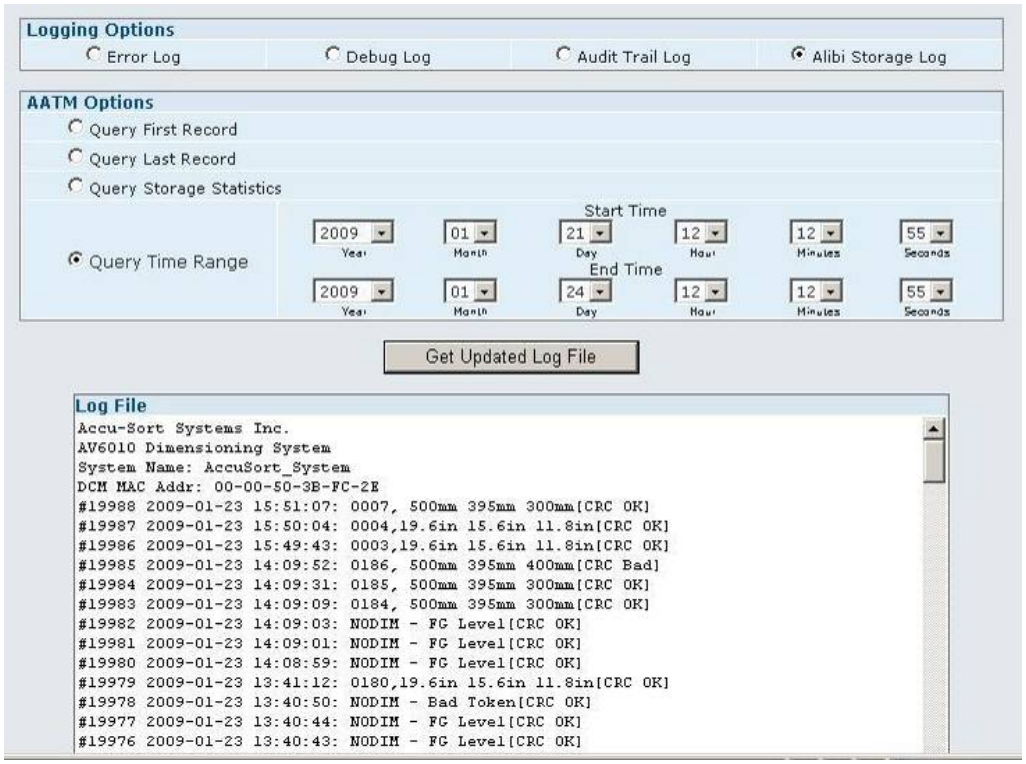


Figure G-9: Alibi Storage Log

Table G-1: Diagnostics > Top > Logging Descriptions

Selection	Definition
Logging Options (Dimensioning-specific)	
Audit Trail Log	Opens the Audit Trail Log for viewing in the Log File section of the screen. Results are scrollable. *(Figure G-8.)*
Alibi Storage Log	Opens the Alibi Storage Log for viewing in the Log File section of the screen. Results are scrollable. *(Figure G-9.)*
AATM Options (Alibi and Audit Trail Manager)	
Query First Record	Displays the first record when selected.
Query Last Record	Displays the last record when selected.
Query Storage Statistics	Displays the storage spac e used and the remaining space available.
Query Time Range	Select a Start Time and End Time by defining the Year, Month, Day, Hour, Minutes and Seconds for each. ***NOTE:*** *Camera times are always in GMT (Greenwich Mean Time).*

Get Updated Log File – After making the desired selection from the option buttons, click the **Update** button to view the log in the Log File area of the screen.

Certified Dimensioning for Legal-for-Trade Applications

The AccuVision AV6010 Long-Range Camera System is certified to meet the following regulatory requirements:

- The NCWM (National Conference on Weights and Measures) NTEP (National Type Evaluation Program)
- Measurement Canada (MC) *
- International Organization of Legal Metrology (OIML) R129, Measurement Instrument Directive (MID), and Western Europe Legal Metrology Cooperation (WELMEC)

Remote Display

In all legal-for-trade applications, the AV6010 certified dimensioning system is required to have at least one remote display per site for inspection purposes. This can either be a laptop computer or the optional Remote Display available from Accu-Sort *(Figure G-4)*.

The Remote Display is a 2 line by 20 character vacuum fluorescent display. The display shows the dimensions for the most recent two boxes (with the most recent box on the lower line). The display will show:

B LL.L WW.W HH.H in or mm

Figure G-10: Dimensions on Remote Display

where:

B is box number (0 to 9)

L is longest horizontal dimension (length)

W is shortest horizontal dimension (width)

H is height

Dimensions are displayed in either inches or millimeters.

* *Measurement Canada (MC) requires a dedicated Remote Display for every dimensioning system on site. Most other certified dimensioning applications will use a customer-supplied laptop computer as the remote display.*

Certification Inspection and Sealing

The AccuVision AV6010 Long-Range Camera System with in-camera dimensioning is certified for singulated applications (i.e., for dimensioning non-touching packages). Any AV6010 top-read camera used in legal-for-trade applications must be “sealed” to prevent unauthorized access to metrologically significant parameters and physical movement of the unit. *(See Figure G-1.)*

The AV6010 RangeFinder and AV6010 with in-camera dimensioning are Category 3 devices with an “audit trail” and the ability to detect a non-zero condition (i.e., movement of the conveyor with respect to the AV6010). As such, it does not require any type of sealing. Information about the audit trail is provided earlier in *Appendix G (pg. G-6).*

The approval specifications for AV6010 with in-camera dimensioning are shown on labels attached to the underside of the top-read camera’s DCM and also on the mounting structure.

The **NCWM (NTEP) and Measurement Canada** specifications are shown in *Figure G-12*.

The **OIML\MID\WELMEC** specifications are shown in *Figure G-13.*

The most current AV6010 certified dimensioning system certificates can be viewed at:

- http://www.ncwm.net/ntep/certificate/08-067P.pdf (NTEP)
- http://www.ic.gc.ca/pics/lm/mass/am/5696t.pdf (Measurement Canada)
- http://www.oiml.org/certificates/CERTIFICATES.html (OIML)

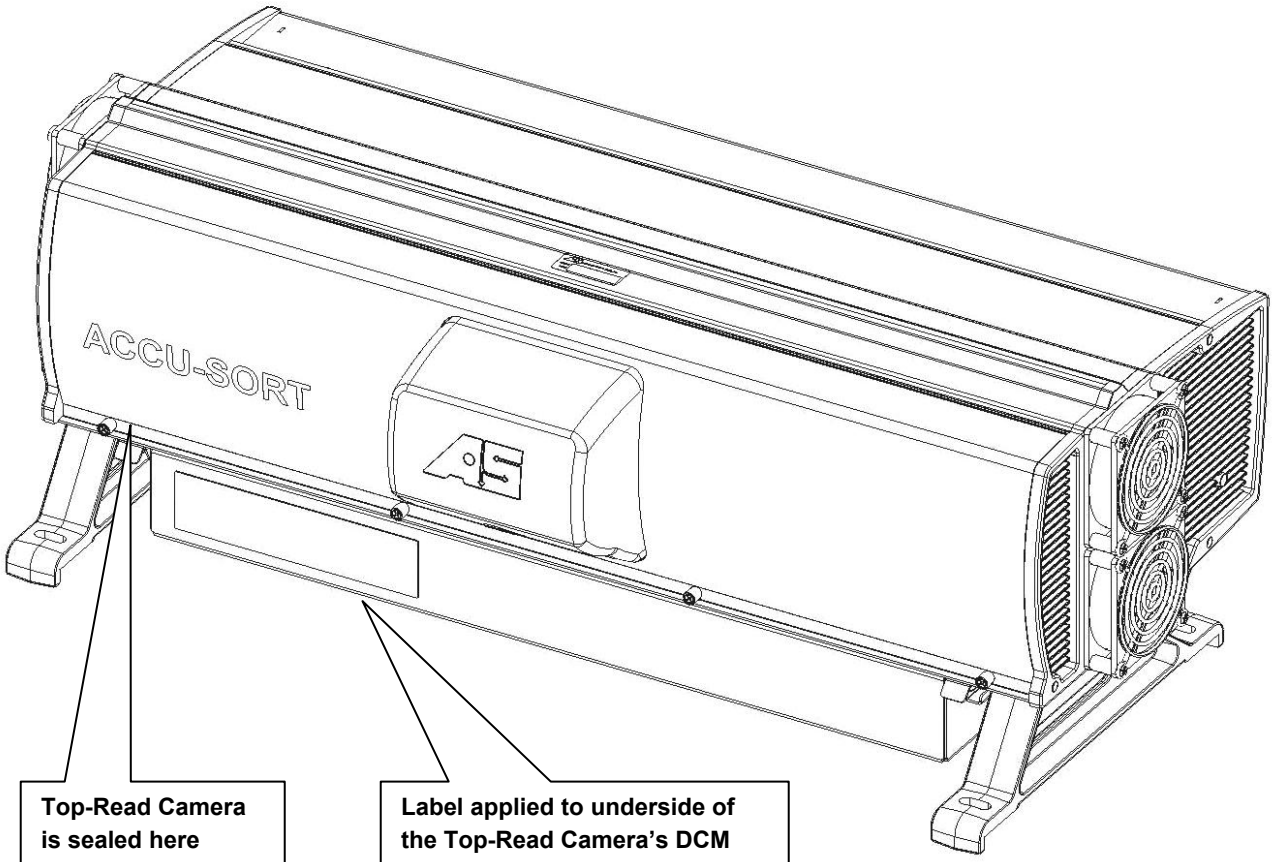
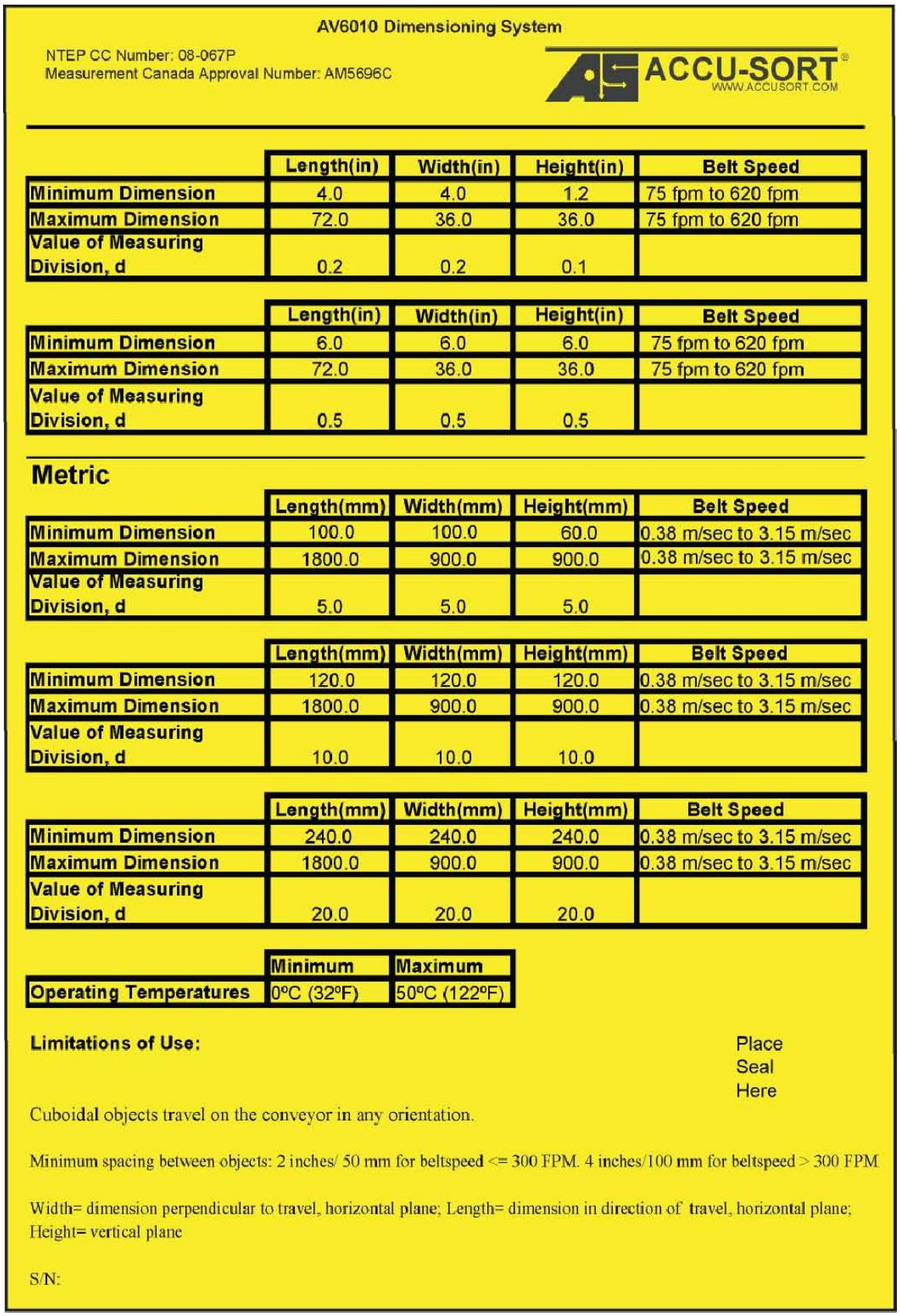


Figure G-11: Location of Specification Label for Approved AV6010 Dimensioning System (NTEP/MC/OIML)



AV6010 Dimensioning System

NTEP CC Number: 08-067P
Measurement Canada Approval Number: AM5696C

ACCU-SORT
WWW.ACCUSORT.COM

	Length(in)	Width(in)	Height(in)	Belt Speed
Minimum Dimension	4.0	4.0	1.2	75 fpm to 620 fpm
Maximum Dimension	72.0	36.0	36.0	75 fpm to 620 fpm
Value of Measuring Division, d	0.2	0.2	0.1	

	Length(in)	Width(in)	Height(in)	Belt Speed
Minimum Dimension	6.0	6.0	6.0	75 fpm to 620 fpm
Maximum Dimension	72.0	36.0	36.0	75 fpm to 620 fpm
Value of Measuring Division, d	0.5	0.5	0.5	

Metric

	Length(mm)	Width(mm)	Height(mm)	Belt Speed
Minimum Dimension	100.0	100.0	60.0	0.38 m/sec to 3.15 m/sec
Maximum Dimension	1800.0	900.0	900.0	0.38 m/sec to 3.15 m/sec
Value of Measuring Division, d	5.0	5.0	5.0	

	Length(mm)	Width(mm)	Height(mm)	Belt Speed
Minimum Dimension	120.0	120.0	120.0	0.38 m/sec to 3.15 m/sec
Maximum Dimension	1800.0	900.0	900.0	0.38 m/sec to 3.15 m/sec
Value of Measuring Division, d	10.0	10.0	10.0	

	Length(mm)	Width(mm)	Height(mm)	Belt Speed
Minimum Dimension	240.0	240.0	240.0	0.38 m/sec to 3.15 m/sec
Maximum Dimension	1800.0	900.0	900.0	0.38 m/sec to 3.15 m/sec
Value of Measuring Division, d	20.0	20.0	20.0	

	Minimum	Maximum
Operating Temperatures	0ºC (32ºF)	50ºC (122ºF)

Limitations of Use:

Place Seal Here

Cuboidal objects travel on the conveyor in any orientation.

Minimum spacing between objects: 2 inches/ 50 mm for beltspeed <= 300 FPM. 4 inches/100 mm for beltspeed > 300 FPM

Width= dimension perpendicular to travel, horizontal plane; Length= dimension in direction of travel, horizontal plane; Height= vertical plane

S/N:

Figure G-12: Specifications Label for NCWM (NTEP) and Measurement Canada Approved AV6010 Dimensioning System

AV6010 Dimensioning System

MID Certificate Number: T10194
OIML Certificate Number: NL1-09.10

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	Length	Width	Height
Min =	100 mm [4.0 in]	100 mm [4.0 in]	50 mm [2.0 in]
Max =	1800 mm [72 in]	900 mm [36 in]	900 mm [36 in]
d =	5 mm [0.2 in]	5 mm [0.2 in]	5 mm [0.2 in]

	Minimum	Maximum
Conveyor Speed	Vmin = 0.38 m/s [75 ft/min]	Vmax = 3.15 m/s [620 ft/min]
Temperature Range	0°C (32°F)	40°C (104°F)
Minimum Spacing	50 mm (2 in) from 0.38 m/s (75 ft/min) to 1.6 m/s (300 ft/min) 100 mm (4 in) from 1.7 m/s (301 ft/min) to 3.15 m/s (620 ft/min)	

Place Seal Here

Limitations of Use : For singulated opaque and cuboidal objects only

Unit Serial Number:
Calibration Counter Value:

AV6010 Dimensioning System

MID Certificate Number: T10194
OIML Certificate Number: NL1-09.10

ACCU-SORT
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	Length	Width	Height
Min =	100 mm [4.0 in]	100 mm [4.0 in]	100 mm [4.0 in]
Max =	1800 mm [72 in]	900 mm [36 in]	900 mm [36 in]
d =	10 mm [0.5 in]	10 mm [0.5 in]	10 mm [0.5 in]

	Minimum	Maximum
Conveyor Speed	Vmin = 0.38 m/s [75 ft/min]	Vmax = 3.15 m/s [620 ft/min]
Temperature Range	0°C (32°F)	40°C (104°F)
Minimum Spacing	50 mm (2 in) from 0.38 m/s (75 ft/min) to 1.6 m/s (300 ft/min) 100 mm (4 in) from 1.7 m/s (301 ft/min) to 3.15 m/s (620 ft/min)	

Place Seal Here

Limitations of Use : For singulated opaque and cuboidal objects only

Unit Serial Number:
Calibration Counter Value:

AV6010 Dimensioning System

MID Certificate Number: T10194
OIML Certificate Number: NL1-09.10

ACCU-SORT
WWW.ACCUSORT.COM

	Length	Width	Height
Min =	200 mm [6.0 in]	200 mm [6.0 in]	200 mm [6.0 in]
Max =	1800 mm [72 in]	900 mm [36 in]	900 mm [36 in]
d =	20 mm [0.5 in]	20 mm [0.5 in]	20 mm [0.5 in]

	Minimum	Maximum
Conveyor Speed	Vmin = 0.38 m/s [75 ft/min]	Vmax = 3.15 m/s [620 ft/min]
Temperature Range	0°C (32°F)	40°C (104°F)
Minimum Spacing	50 mm (2 in) from 0.38 m/s (75 ft/min) to 1.6 m/s (300 ft/min) 100 mm (4 in) from 1.7 m/s (301 ft/min) to 3.15 m/s (620 ft/min)	

Place Seal Here

Limitations of Use : For singulated opaque and cuboidal objects only

Unit Serial Number:
Calibration Counter Value:

Figure G-13: Specifications Labels for OIML Approved AV6010 Dimensioning System

H Raw Image Export (RIE)

Introducing AV6010 with Raw Image Export (RIE)

Any bar code reading application using an AV6010 Camera can also be configured to provide raw image export (RIE) of high-resolution images at high speeds. Typically, this is used in optical character recognition (OCR) applications.

If your system is RIE-enabled, the camera(s) will be equipped with a DCM that includes the optional Raw Image Export (RIE) COM-e module.

There are only a few special hardware or electrical installation requirements for an AV6010 RIE application. The initial RIE setup is handled through the AV6010's web-browser user interface.

CAUTION: Because of the complexity of the AV6010 Camera System, it is recommended that only authorized and trained service technicians perform set-up, parameter adjustments, changes or FRU part replacement. Special training is required for AV6010 systems equipped with RIE. Training is available from Accu-Sort. Contact your sales representative or customer service for additional information. Do not attempt to set-up a system for RIE without proper training or the assistance of Accu-Sort technical support.

Prerequisites:

To utilize AV6010's in-camera raw image export (RIE) capabilities, the following is required:

- AV6010 Camera(s) with RIE-capable DCM
  (COM-e#3 populated for RIE and 1GB Copper board in PCI slot)
- Review application specifications and define requirements with an Accu-Sort Applications Engineer

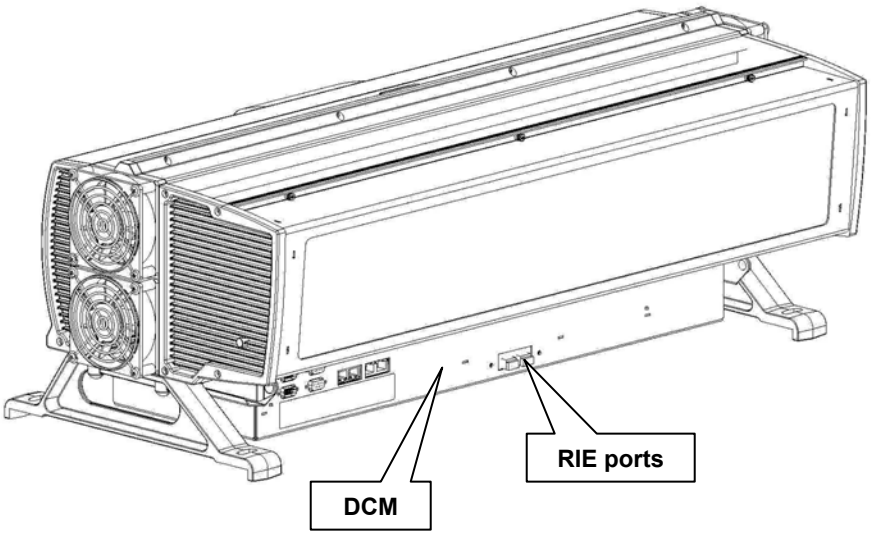
The basic requirements for interfacing with AV6010 RIE includes:

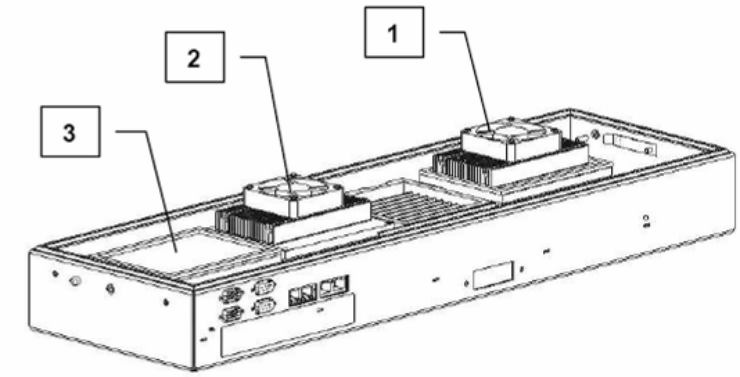
- RIE Destination Server (Linux-based)
  (Hardware configuration is determined with the user by an Accu-Sort application engineer based upon the application requirements.)
- Dual port network card (1GB throughput per RJ45 port)
  (Slower applications may only use one port)
- C++ (or C) compatibility with the ASI RIE Library / Application Programming Interface

RIE Installation Requirements

An RIE-compatible camera includes the following installed in the Distributed Computing Module (DCM):

- Raw Image Export (RIE) software
- a COM-e module properly installed in DCM position 3
- 1GB Copper board in PCI slot





DCM with Decoding and Dimensioning Modules (1000068422) shown

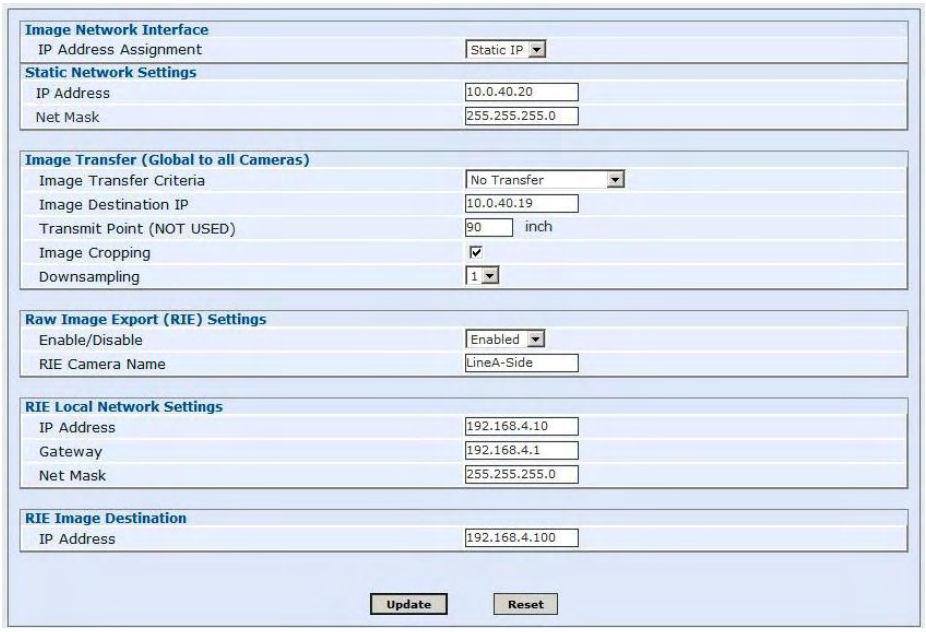
1 = COMe#1 (Decoding module)
2 = COMe#2 (Dimensioning module)
3 = COMe#3 (Raw Image Export (RIE) module, shown not populated)

RIEchk Test Application

The RIEchk application is available for download from the AV6010 User Interface's downloads screen. This Windows-based application is useful in testing that the RIE module is at least minimally configured for the export of images.

AV6010 User Interface Screens related to RIE

When a camera in a system is equipped with RIE capabilities, the Imaging Network screen for that camera will allow raw image export to be enabled. After login, go to **Setup > Communications > (Camera Name) > Image Network** to view the screen.



Communications > (Camera) > Image Network (RIE Enabled)

Raw Image Export Settings Descriptions

Selection	Definition
Raw Image Export (RIE) Settings	
Enable/Disable	Drop-list to select either enable or disable. (Currently, a camera reboot is also required.)
RIE Camera Name	Allows a unique name to be assigned to the RIE COM-e module of the camera so it can be identified by the RIE Destination Server. (This field is blank by default.)
RIE Local Network Settings	
IP Address	Enter the IP address for the RIE-equipped camera
Gateway	Currently not used
Net Mask	Currently not used
RIE Image Destination	
IP Address	Enter the address for the RIE Destination Server (host)

NOTE: For additional information, see the **AccuVision AV6010 RIE API User Guide** (1000069108). This document is provided to all users with RIE-equipped camera systems. If you did not receive this document, contact your Accu-Sort sales representative or application engineer.

Notes:

I Installation Drawings

IMPORTANT: Due to the complex and application-specific nature of camera system / dimensioning installations, it is recommended that the AV6010 be setup by a trained and authorized Accu-Sort technician.

For further information on training, contact us at 1-800-BAR-CODE.

Any application-specific drawings shipped with the equipment may supersede the drawings provided in this appendix.

AccuVision AV6010 Installation Drawings

The drawings provided in this appendix are useful when mechanically and electrically installing the AV6010 Long-Range Camera System.

Mechanical Installation Drawings

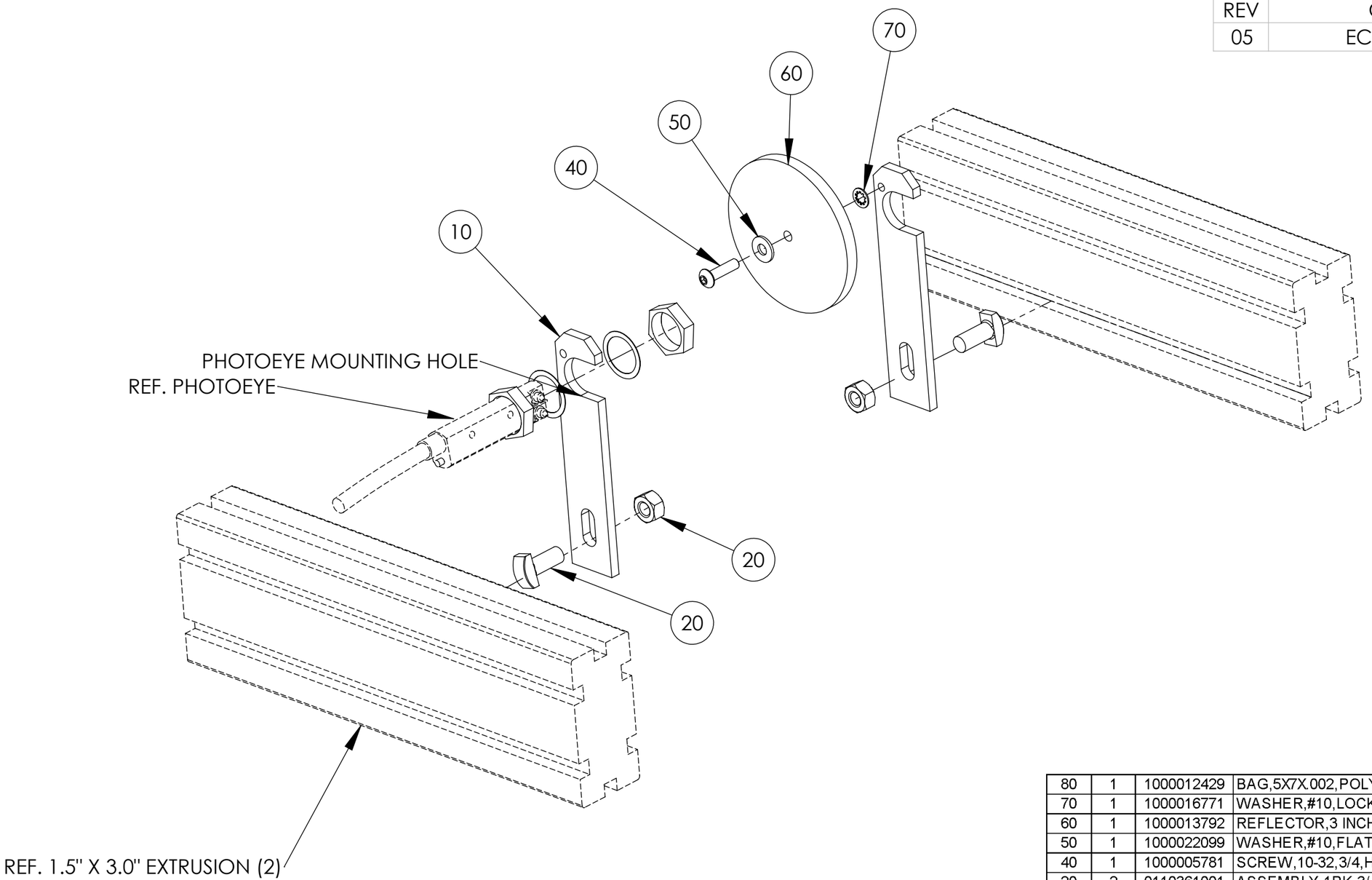
- AV6010 Mechanical Specification Drawing (xxxxx)
- Tachometer Anti-Static Brush (102974)
- Photoeye/Tach Generator Mounting & Installation (112873)

Electrical Installation Drawings

- Single-Camera System Interconnect Diagram (112754)
- Multiple-Camera System Interconnect Diagram (112753 – 4 sheets)
    - AC Power (sheet 1)
    - SYNC Network (sheet 2)
    - IMAGE Network (sheet 3)
    - FAST Monitor (sheet 4)
- Power Distribution Box Wiring for Six Camera System (111062)
- AV6010 Connector Pinouts Diagram (111515)

Notes:

REVISION			
REV	CHANGE	BY	DATE
05	ECO 10-3	AS	02/17/10



ITEM	QTY.	PART NO.	DESCRIPTION
80	1	1000012429	BAG,5X7X.002,POLY **(NOT SHOWN)**
70	1	1000016771	WASHER,#10,LOCK,INTERNAL TOOTH,,
60	1	1000013792	REFLECTOR,3 INCH
50	1	1000022099	WASHER,#10,FLAT
40	1	1000005781	SCREW,10-32,3/4,HEX,CAP,BUTTON HEAD,STEEL,BLACK OXIDE
20	2	0110361001	ASSEMBLY,1PK,3/4IN,T-STUD AND FLANGED NUT
10	2	1000008700	PLATE,STRAIGHT,PHOTOEYE/REFLECTOR

PART NO. 1000020589

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ALL C-CINKS ARE 82° INCLUDED ANGLE
ALL BEND RELIEFS TO SUIT
TOLERANCES:

INCH	[METRIC]	ANGULAR
.X±.1000	[X±2.500]	X±1.00°
.XX±.0200	[.X±0.500]	.X±0.10°
.XXX±.0050	[.XX±0.130]	.XX±0.01°
.XXXX±.0005	[.XXX±0.013]	

FRACTIONS ±1/4
FT.,IN ±1"
REMOVE SHARP EDGES AND BURRS

DRAWN	AS	DATE	01/16/09
CHKD	XXX	DATE	XX.XX.XX
ENGR	AS	DATE	XX.XX.XX
DEPT.	MECH ENG		
E-	N/A		
CUSTOMER	N/A		
CONTRACT #	N/A		

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TELFORD, PA 18969 USA

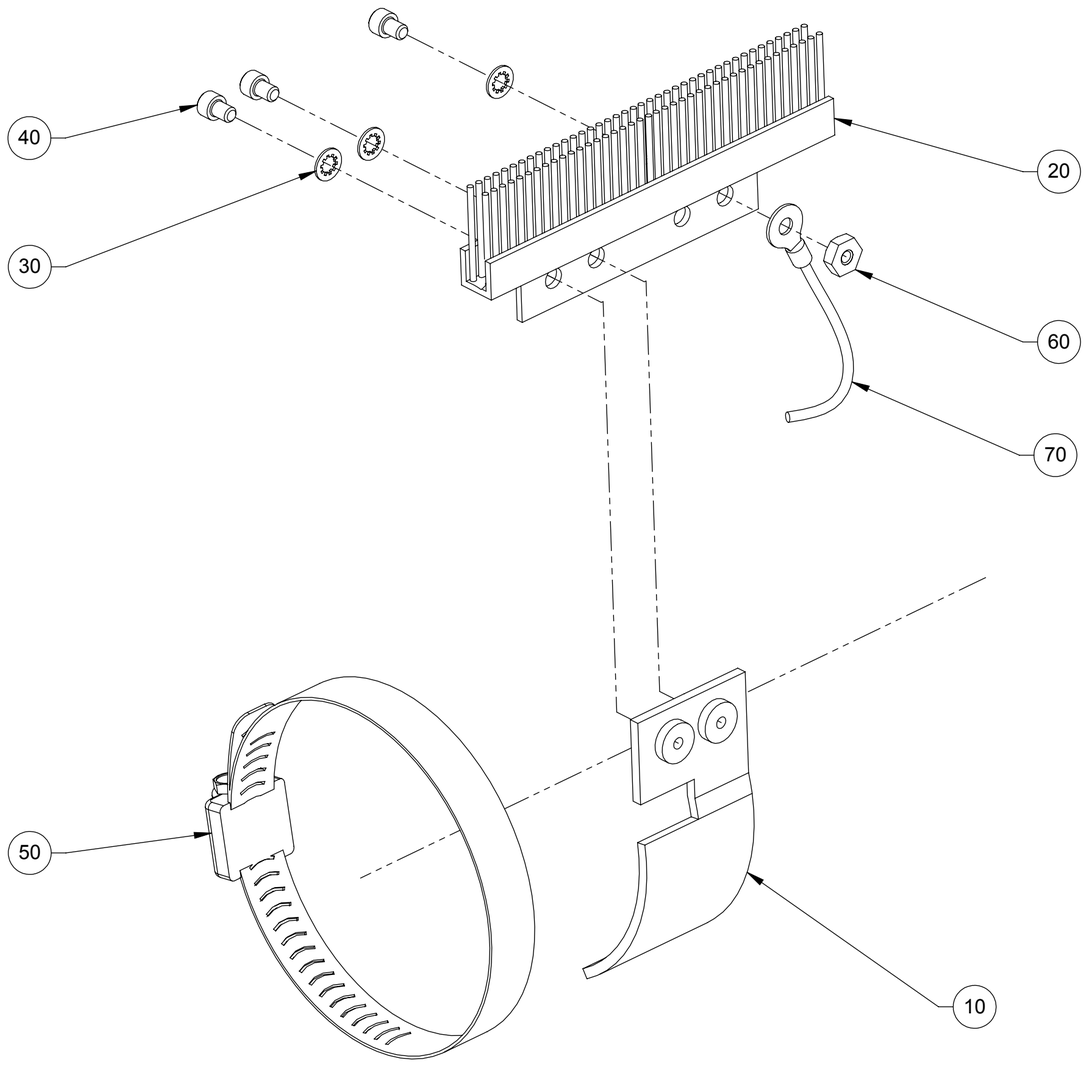
KIT, MOUNTING, REFLECTOR PHOTOEYE

SIZE	CAGE CODE	DWG. NO.
B	53830	41222

SCALE NONE CAD SYS. SOLIDWORKS SHEET 1 OF 1

NOTES:
1) COMPONENTS LISTED IN ERP BILL OF MATERIALS (REF. # 0102974001)
2) ATTACH ONE END OF THE 3 FT. GROUND WIRE TO ITEM 20 USING #6-32 CAP SCREW AND #6-32 HEX NUT AS SHOWN.

REVISION			
REV	CHANGE	BY	DATE
05	09-402	AS	10/28/09



	ITEM	QTY.	PART NO.	DESCRIPTION
SHEET 2	100	1	1000066953	FERRITE,STAR-RING RINGCORE WITH PLASTIC CASE,BLACK SNAP,CABLE DIA MAX 27MM,ROHS EU
SHEET 2	90	1	0102974000	DIAGRAM,INSTALLATION,ANTI-STATIC BRUSH ASSEMBLY
NOT SHOWN	80	1	1000009725	SCREW,6-32,1,HEX,CAP,SOCKET HEAD,STEEL,BLACK OXIDE
	70	1	1000053263	ASSEMBLY,GROUND-WIRE,ANTI-STATIC BRUSH
	60	2	1000018459	NUT,#6-32 HEX
	50	1	1000050624	CLAMP,3.5IN HOSE
	40	3	1000009683	SCREW,6-32,1/4,HEX,CAP,SOCKET HEAD,STAINLESS
	30	4	1000016777	LOCKWASHER,#6 INTERNAL TOOTH,STAINLESS
	20	1	0102973001	BRUSH,TACHOMETER, ANTI-STATIC
	10	1	0102972001	BRACKET,TACHOMETER BRUSH,ANTI-STATIC

PART NO. 0102974001

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ALL C-CINKS ARE 82° INCLUDED ANGLE
ALL BEND RELIEFS TO SUIT
TOLERANCES:

INCH	[METRIC]	ANGULAR
.X±.1000	[X±2.500]	X±1.00°
.XX±.0200	[.X±0.500]	.X±0.10°
.XXX±.0050	[.XX±0.130]	.XX±0.01°
.XXXX±.0005	[.XXX±0.013]	

FRACTIONS ±1/4
FT.,IN ±1"
REMOVE SHARP EDGES AND BURRS

DRAWN	AS	DATE	08/26/09
CHKD	XXX	DATE	XX.XX.XX
ENGR	DJK	DATE	04/25/01
DEPT.	MECH ENG		
E-	N/A		
CUSTOMER	N/A		
CONTRACT #	N/A		

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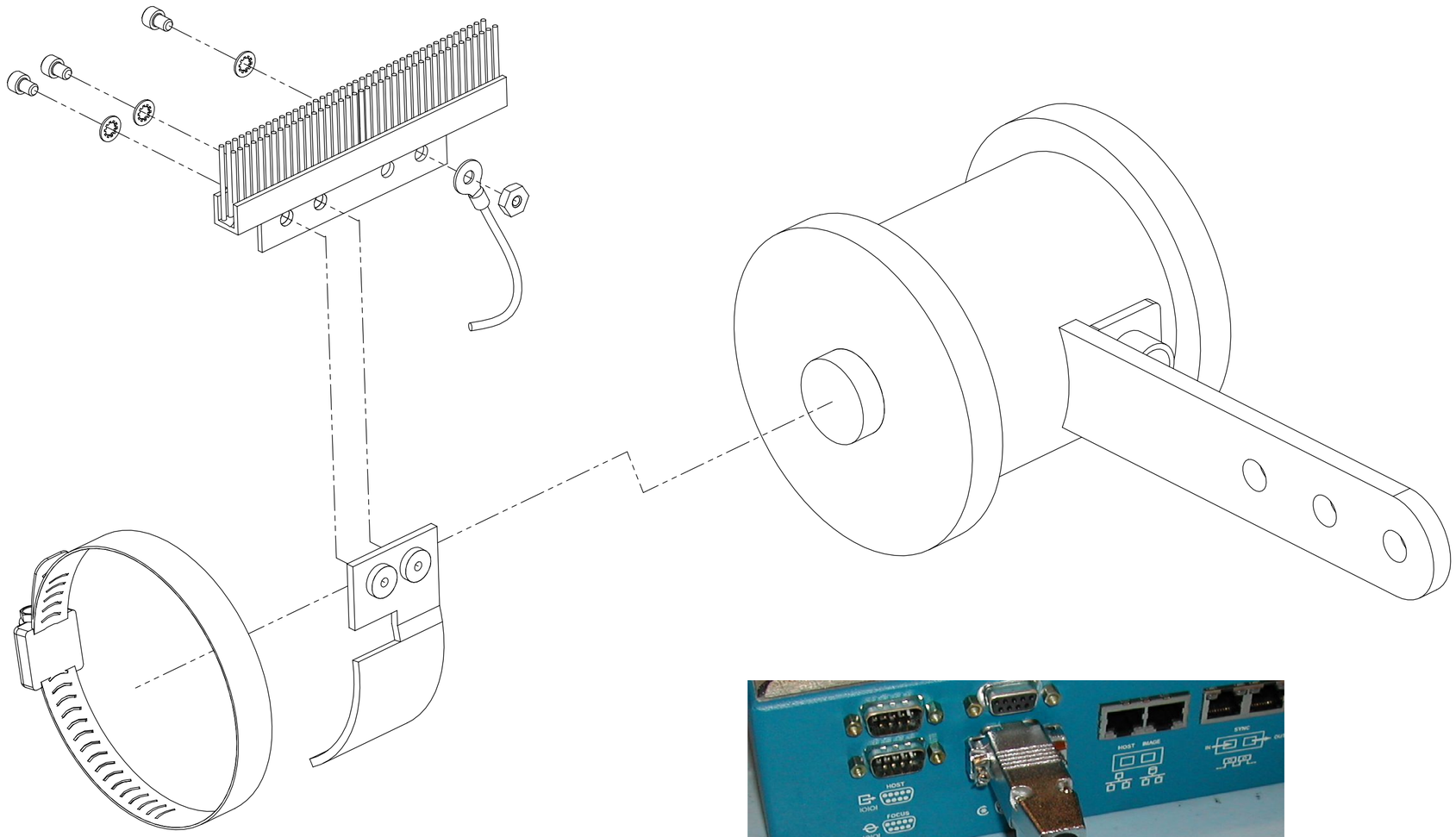
TELFORD, PA 18969 USA

ASSEMBLY, BRUSH, ANTI-STATIC

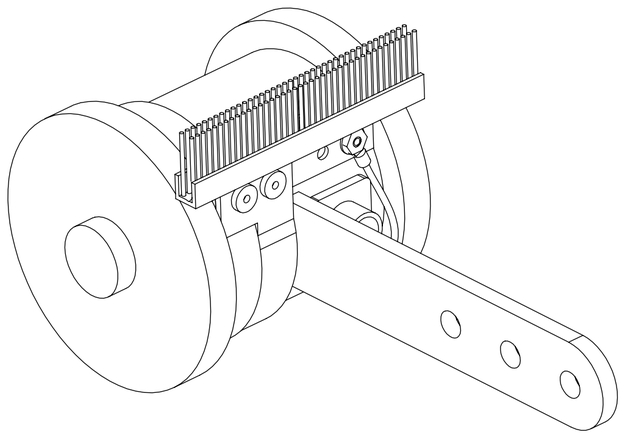
SIZE	CAGE CODE	DWG. NO.	
C	53830	102974	
SCALE NONE	CAD SYS. SOLIDWORKS	SHEET 1 OF 2	

REVISION
05

NOTES:
1) ATTACH OPPOSITE END OF GROUND WIRE TO CONVEYOR ESTABLISHING EARTH GROUND USING (1) #6-32 SCREW, (1) #6 HEX NUT, AND (1) #6 LOCKWASHER SUPPLIED.
2) INSTALL BRUSH TOUCHING CONVEYOR NO MORE THAN 1/8" FROM BELT.
3) CABLE TO WRAP AROUND FERRITE A MINIMUM OF 6 TIMES AS SHOWN.



SEE NOTE 2
FOR POSITIONING INFO.



ASSEMBLED VIEW

FERRITE INSTALLATION AND LOCATION
SEE NOTE 3

PART NO. 0102974000

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ALL BEND RELIEFS TO SUIT
TOLERANCES:

INCH	[METRIC]	ANGULAR
.X±.1000	[X±2.500]	X±1.00°
.XX±.0200	[.X±0.500]	.X±0.10°
.XXX±.0050	[.XX±0.130]	.XX±0.01°
.XXXX±.0005	[.XXX±0.013]	

FRACTIONS ±1/4
FT.,IN ±1"
REMOVE SHARP EDGES AND BURRS

DRAWN	AS	DATE	08/26/09
CHKD	XXX	DATE	XX.XX.XX
ENGR	DJK	DATE	04/25/01
DEPT.	MECH ENG		
E-	N/A		
CUSTOMER	N/A		
CONTRACT #	N/A		

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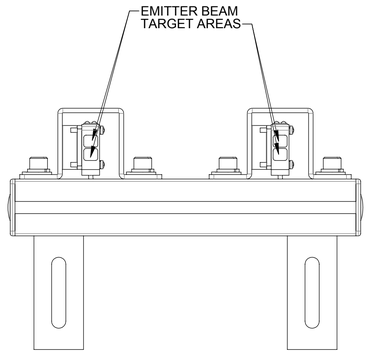
TELFORD, PA 18969 USA

ASSEMBLY, BRUSH, ANTI-STATIC
INSTALLATION

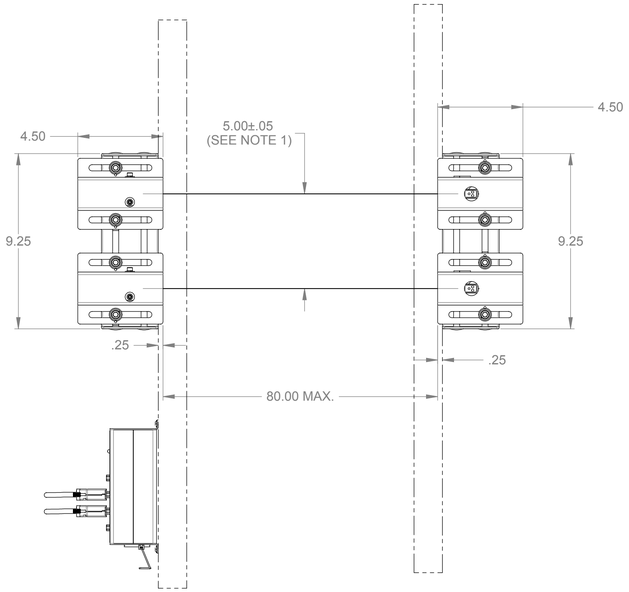
SIZE	CAGE CODE	DWG. NO.	
C	53830	102974	
SCALE	NONE	CAD SYS. SOLIDWORKS	SHEET 2 OF 2

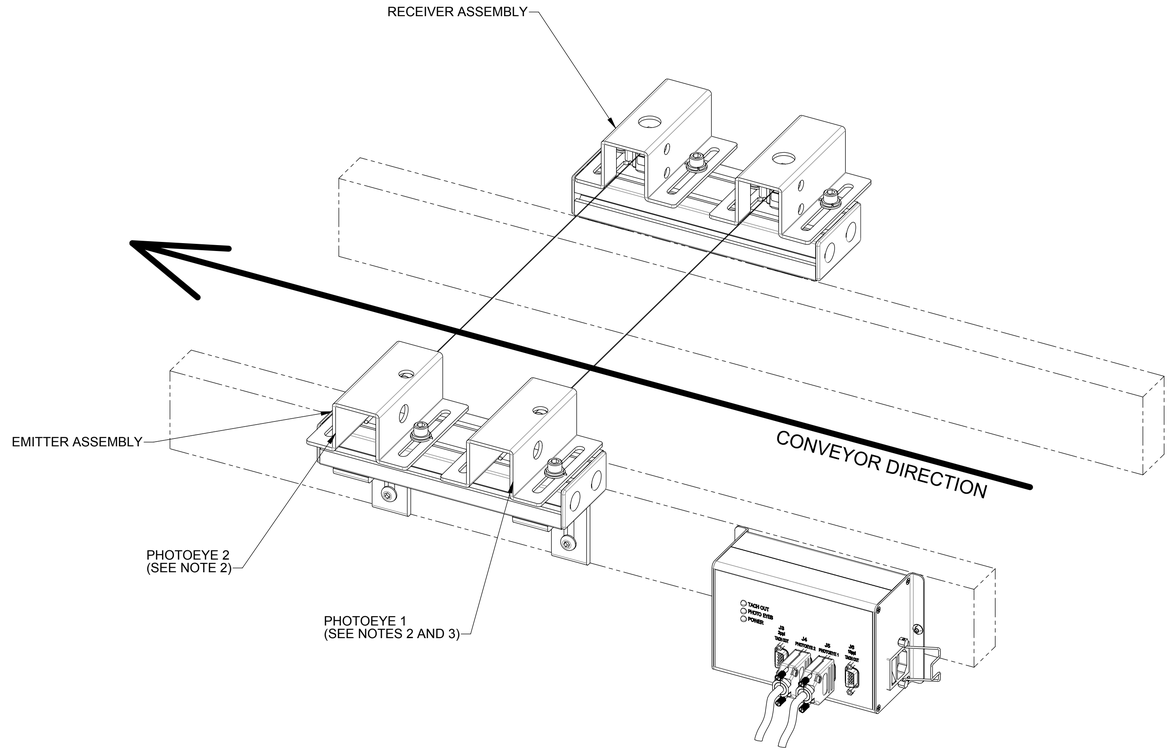
NOTES:
1) EMITTER BEAMS MUST BE PARALLEL AND PLACED AS SHOWN.
2) CABLE LENGTH: 12 FEET.
3) PHOTOEYE 1 IS ALWAYS UPSTREAM.

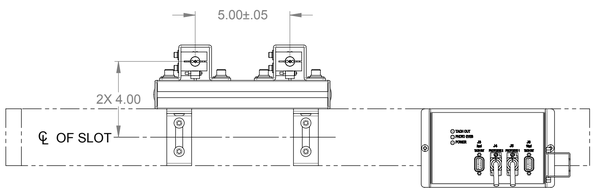
REVISION			
REV	CHANGE	BY	DATE
01	08-696	AS	02/02/10

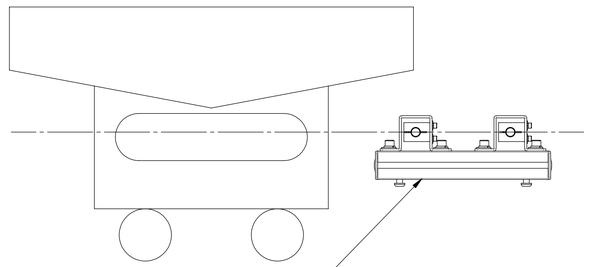


RECEIVER ASSEMBLY

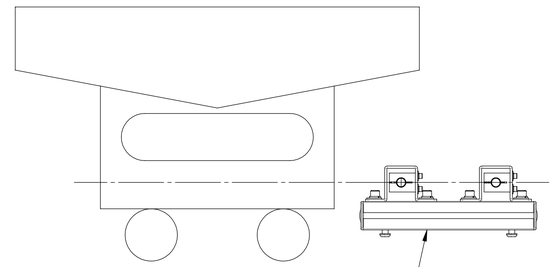








INCORRECT LOCATION
(BEAMS PASSING THROUGH
OPENING IN TRAY BASE
WILL PRODUCE MULTIPLE
TRIGGERS PER TRAY)



CORRECT LOCATION
(INSTALLED TO PERMIT THE BEAMS
TO BE BROKEN ONLY ONE TIME PER TRAY)

PART NO. 0112873001

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES [MILLIMETERS]
ALL ANGLES ARE 90°
ALL C-CINKS ARE 82° INCLUDED ANGLE
ALL BEND RELIEFS TO SUIT
TOLERANCES:

INCH	[METRIC]	ANGULAR
.X±.1000	[.X±2.500]	.X±1.00°
.XX±.0200	[.X±0.500]	.X±0.10°
.XXX±.0050	[.XX±0.130]	.XX±0.01°
.XXXX±.0005	[.XXX±0.013]	

FRACTIONS ±1/4
FT.,IN ±1"

REMOVE SHARP EDGES AND BURRS

DRAWN	AS	DATE	01/21/10
CHKD	XXX	DATE	XX.XX.XX
ENGR	AS	DATE	01/21/10
DEPT.	MECH ENG		
E-	N/A		
CUSTOMER	N/A		
CONTRACT #	N/A		

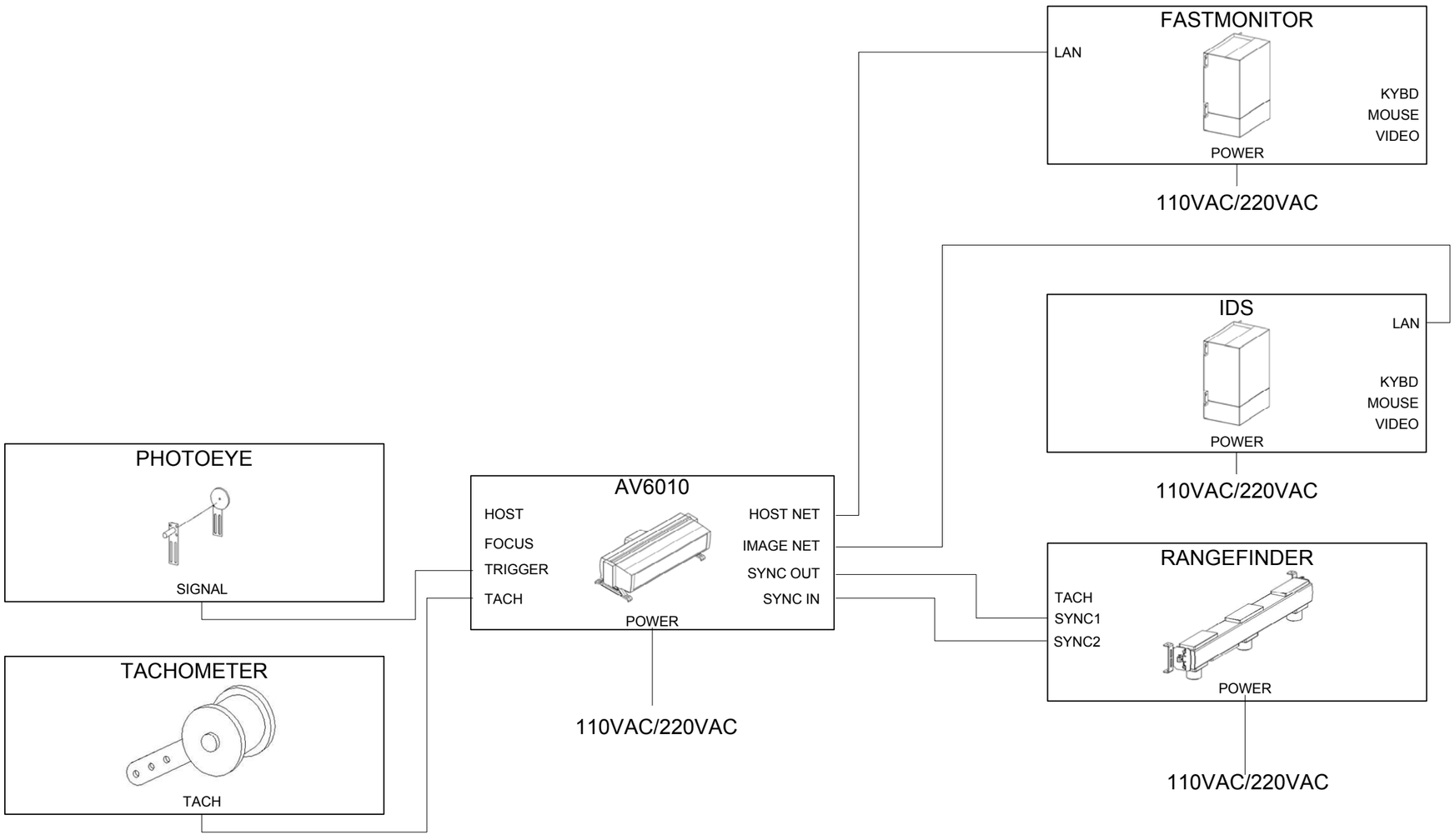
ACCU-SORT® SYSTEMS, inc.
TELFORD, PA 18969 USA

MOUNTING AND INSTALLATION

PHOTOEYE TACH GENERATOR

SIZE	CAGE CODE	DWG NO.	
D	53830	112873	
SCALE	NONE	CAD SYS. SOLIDWORKS	SHEET 1 OF 1

REVISIONS			
REV		BY	DATE
1	Initial Release	MR	8/28/09



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DRAWN	MR	DATE	8/28/09
CHKD	MR	DATE	8/28/09
ENGR	MR	DATE	8/28/09
DEPT	APP ENG		

CUSTOMER

CONTRACT

ACCU-SORT SYSTEMS
TELFORD, PA. 18969 U S A

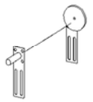
CONNECTIONS, AV6010 SINGLE CAMERA

112754

FILENAME: 112754 REV 01 CONNECTIONS AV6010 SINGLE CAMERA.vsd

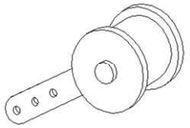
SHEET 1 OF 1

PHOTOEYE



SIGNAL

TACHOMETER



TACH

AV6010

HOST
FOCUS
TRIGGER
TACH

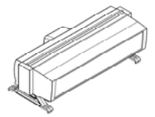
MOST ACCESSIBLE
OR
HIGHEST % CODES

HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

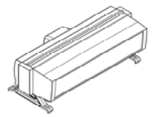


HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

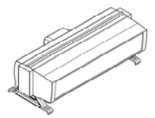


HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

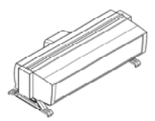


HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH



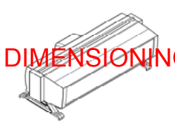
HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

DIMENSIONING

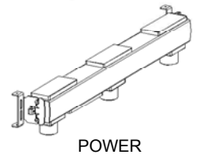


HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

RANGEFINDER

TACH
SYNC1
SYNC2



POWER

REVISIONS

REV		BY	DATE
1	Initial Release	MR	8/28/09

SYNC NETWORK

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DRAWN	MR	DATE	8/28/09
CHKD	MR	DATE	8/28/09
ENGR	MR	DATE	8/28/09
CUSTOMER			
CONTRACT		DEPT	APP ENG

ACCU-SORT SYSTEMS
TELFORD, PA. 18969 U S A

CONNECTIONS, AV6010 MULTIPLE CAMERAS

112753

FILENAME: 112753 REV 01 CONNECTIONS AV6010 MULTIPLE CAMERAS.vsd

REVISIONS			
REV		BY	DATE
1	Initial Release	MR	8/28/09

AV6010

HOST
FOCUS
TRIGGER
TACH

MOST ACCESSIBLE
OR
HIGHEST % CODES

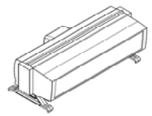
HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

HOST NET
IMAGE NET
SYNC OUT
SYNC IN

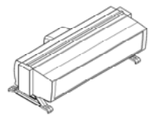


POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

HOST NET
IMAGE NET
SYNC OUT
SYNC IN

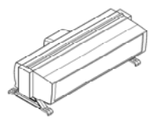


POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

HOST NET
IMAGE NET
SYNC OUT
SYNC IN

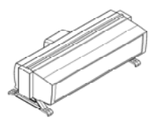


POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

HOST NET
IMAGE NET
SYNC OUT
SYNC IN



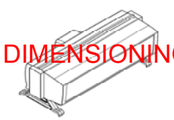
POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

DIMENSIONING

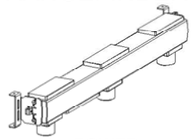
HOST NET
IMAGE NET
SYNC OUT
SYNC IN



POWER

RANGEFINDER

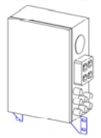
TACH
SYNC1
SYNC2



POWER

PWR DIST BOX

PWR 1
PWR 2
PWR 3
PWR 4
PWR 5
PWR 6



PWR 7

30A PWR IN

110VAC/220VAC

POWER

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DRAWN	MR	DATE	8/28/09
CHKD	MR	DATE	8/28/09
ENGR	MR	DATE	8/28/09
DEPT	APP ENG		

CUSTOMER

CONTRACT

ACCU-SORT SYSTEMS
TELFORD, PA. 18969 U S A

CONNECTIONS, AV6010 MULTIPLE CAMERAS

112753

FILENAME: 112753 REV 01 CONNECTIONS AV6010 MULTIPLE CAMERAS.vsd

REVISIONS			
REV		BY	DATE
1	Initial Release	MR	8/28/09

AV6010

HOST
FOCUS
TRIGGER
TACH

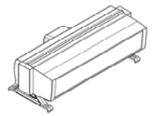
HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

MOST ACCESSIBLE
OR
HIGHEST % CODES

AV6010

HOST
FOCUS
TRIGGER
TACH

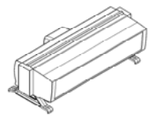


HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

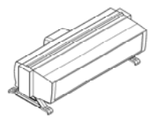


HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

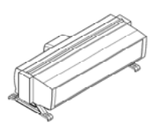


HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

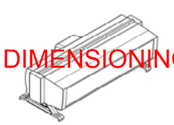


HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH



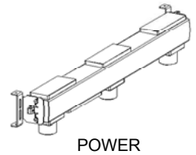
HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

DIMENSIONING

RANGEFINDER

TACH
SYNC1
SYNC2



POWER

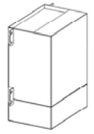
NETWORK SWITCH

PORT 1
PORT 2
PORT 3
PORT 4
PORT 5
PORT 6

PORT 7
PORT 8

POWER

IDS



LAN

KYBD
MOUSE
VIDEO

POWER

KEYBD/MOUSE/VIDEO

KEYBD/MOUSE
VIDEO

VIDEO POWER

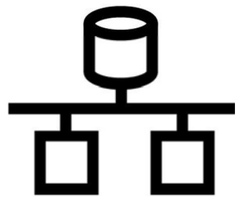


IMAGE NETWORK

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DRAWN	MR	DATE	8/28/09
CHKD	MR	DATE	8/28/09
ENGR	MR	DATE	8/28/09
DEPT	APP ENG		

CUSTOMER

CONTRACT

ACCU-SORT SYSTEMS
TELFORD, PA. 18969 U S A

CONNECTIONS, AV6010 MULTIPLE CAMERAS

112753

FILENAME: 112753 REV 01 CONNECTIONS AV6010 MULTIPLE CAMERAS.vsd

REVISIONS			
REV		BY	DATE
1	Initial Release	MR	8/28/09

AV6010

HOST
FOCUS
TRIGGER
TACH

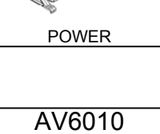
MOST ACCESSIBLE
OR
HIGHEST % CODES

HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

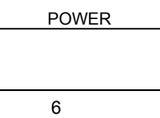


HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH



HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

AV6010

HOST
FOCUS
TRIGGER
TACH

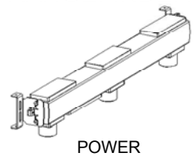
DIMENSIONING

HOST NET
IMAGE NET
SYNC OUT
SYNC IN

POWER

RANGEFINDER

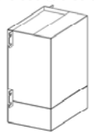
TACH
SYNC1
SYNC2



POWER

FASTMONITOR

LAN



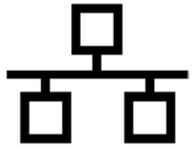
KYBD
MOUSE
VIDEO

POWER

KEYBD/MOUSE/VIDEO

KEYBD/MOUSE
VIDEO

VIDEO POWER



FASTMONITOR (HOST)

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DRAWN	MR	DATE	8/28/09
CHKD	MR	DATE	8/28/09
ENGR	MR	DATE	8/28/09
DEPT	APP ENG		

CUSTOMER

CONTRACT

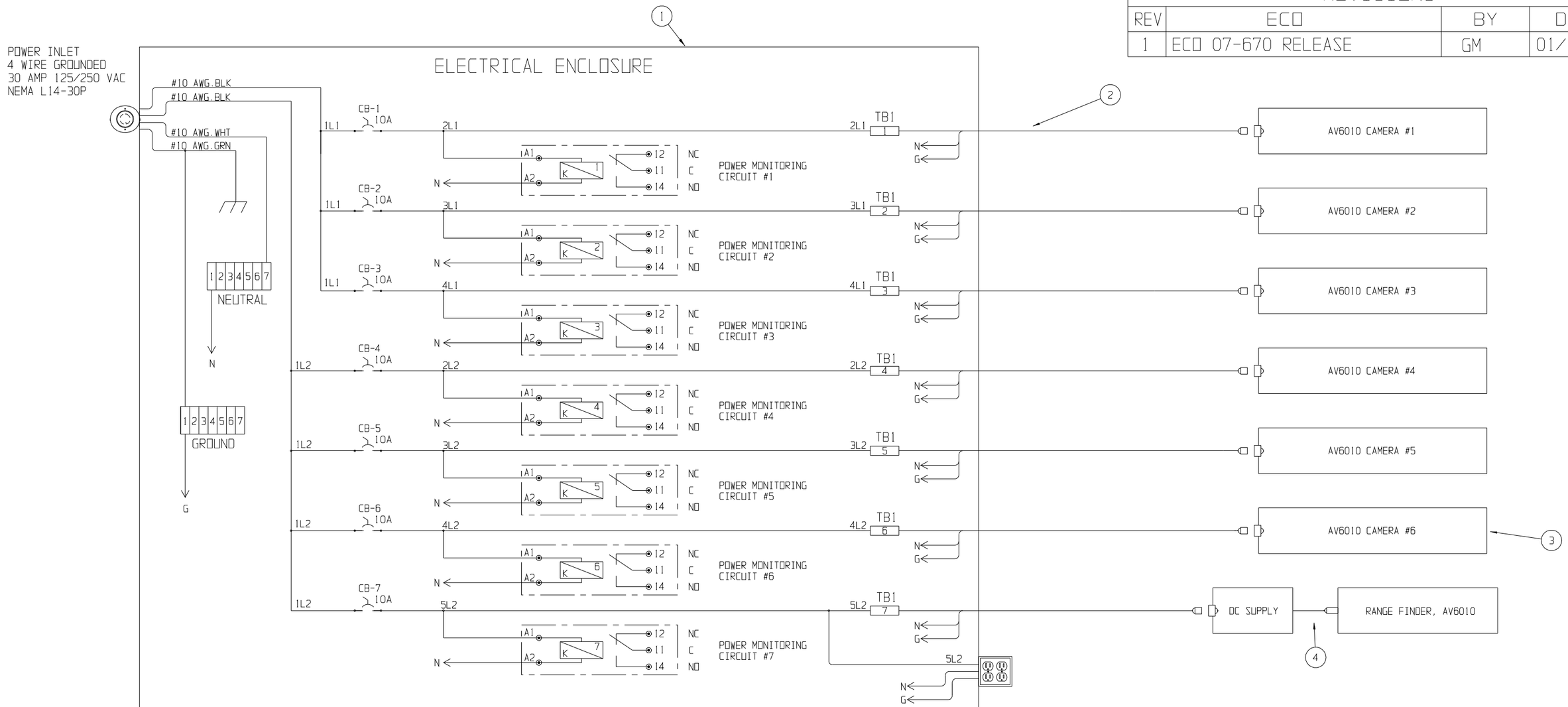
ACCU-SORT SYSTEMS
TELFORD, PA. 18969 U S A

CONNECTIONS, AV6010 MULTIPLE CAMERAS

112753

FILENAME: 112753 REV 01 CONNECTIONS AV6010 MULTIPLE CAMERAS.vsd

REVISIONS			
REV	ECO	BY	DATE
1	ECO 07-670 RELEASE	GM	01/11/08



ITEM	QTY	DESCRIPTION	SPEC.	ASI#
1	1	ELECTRICAL CABINET ASSY	ASI	0111063001
2	REF.	30 FT IEC POWER CABLE	ASI	1000056306
3	REF.	ATO MODEL AV6010 CAMERA	ASI	1000065540
4	REF.	RANGE FINDER, AV6010	ASI	0110754001
SEE NOTE 3 5	REF.	CABLE ASSY, POWER INLET	ASI	0111065001

NOTES:

1. ITEM 1; ELECTRICAL WIRE #14 AWG. BLK, WHT, OR GRN, UNLESS OTHERWISE NOTED.

2. ITEM 1; REFERENCE ENCLOSURE ASSEMBLY DRAWING #111063

3. ITEM 5; IS NOT SHOWN AND OPTIONAL

PART NO. 0-111062-001

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UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES
ALL ANGLES ARE 90 °
ALL C-SINKS ARE 82 °
ALL BEND RELIEFS TO SUIT
TOLERANCES:
LINEAR- .X±.100 ANGULAR- X±1.0°
.XX±.020 .X±.10°
.XXX±.005 .XX±.01°
.XXXX±.0005
FT.,IN ±1"
FRACTIONS ±1/4
REMOVE SHARP EDGES AND BURRS

DRAWN	GM	DATE 04/20/07
CHKD	RS	DATE 04/20/07
ENGR	GM	DATE 04/20/07
DEPT.	APPLICATION ENG	
E-	N/A	
CUSTOMER	N/A	
CONTRACT #	N/A	

ACCU-SORT® SYSTEMS, inc.
TELFORD, PA 18969 USA

WIRING DIAGRAM, POWER DISTRIBUTION - 6 CAMERA AV6010 SYSTEM

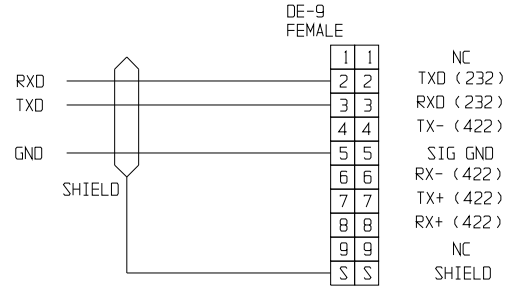
SIZE	CAGE CODE	DWG. NO.
B	53830	111062

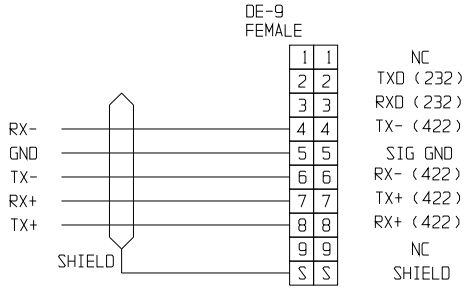
SCALE NONE | CAD SYS. CADKEY | SHEET 1 OF 1

NOTES:
1. ALL CABLES MUST BE SHIELDED.
2. SHIELDS MUST BE TERMINATED 360 DEGREES AT EACH CONNECTOR. REFERENCE DRAWING B-38397 "9-PIN METALLIC STRAIN RELIEF ASSEMBLY".
3. TRIG_DETECT* AND TACH_DETECT* SIGNALS MUST BE LEFT OPEN CIRCUIT OR CONNECTED TO GROUND AT THE CONNECTOR ONLY. THEY MAY NOT BE CONNECTED TO ANY OTHER VOLTAGE SOURCE.

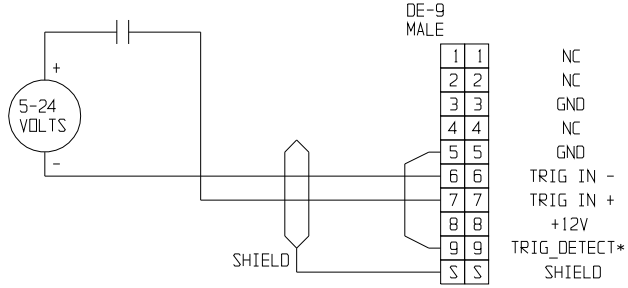
REVISIONS			
REV	CHANGES	BY	DATE
2	ECO 08-89	RJS	01/10/08

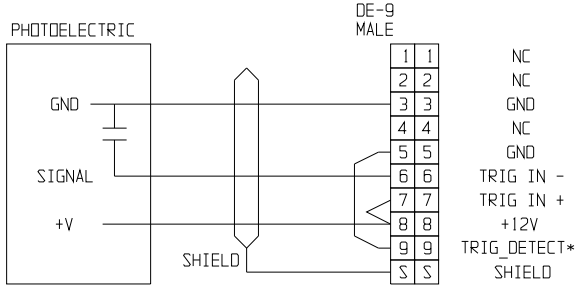
HOST AND FOCUS SERIAL PORTS



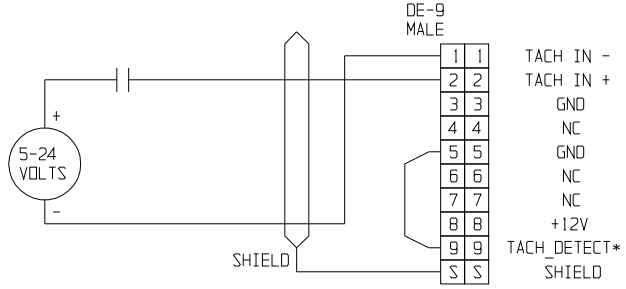


TRIGGER INPUT





TACHOMETER INPUT



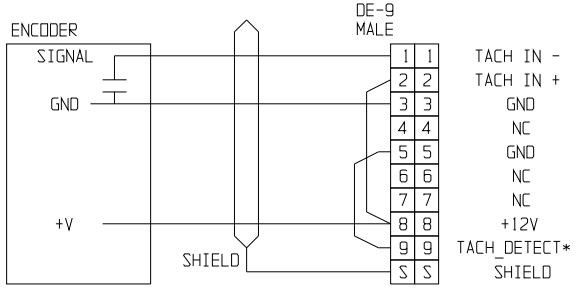
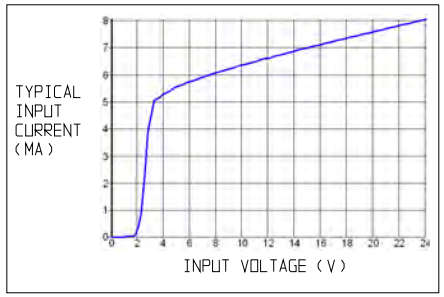


TABLE 1



PART NO. 0111515000

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UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES
ALL ANGLES ARE 90°
ALL C-SINKS ARE 82°
ALL BEND RELIEFS TO SUIT
TOLERANCES:
LINEAR- .X±.1 ANGULAR-X±1.°
.XX±.02 .X±.1°
.XXX±.005 .XX±.01°
.XXXX±.0005
FT. - IN ±1"
FRACTIONS ±1/4
REMOVE ALL BURRS AND SHARP EDGES

DRAWN	RJS	DATE	10/16/07
CHKD	AG	DATE	10/18/07
ENGR	RJS	DATE	10/16/07
DEPT.	R&D ENG		
E-			
CUSTOMER	N/A		
CONTRACT NO.	N/A		

ACCU-SORT® SYSTEMS, inc.
TELFORD, PA 18969 USA

AV6010 CONNECTOR PINOUTS

SIZE	CAGE CODE	DWG. NO.
C	53830	111515

SCALE NONE | CAD SYS. CADKEY | SHEET 1 OF 1

111515.PRT