Site Requirements for Vision[Ai]ry

This document specifies site requirements to accommodate the Vision[Ai]ry system. It includes the following topics:

Ask Us Anything — Ross Video is pleased to provide guidance and answer any questions you might have about planning your installation. Our friendly, experienced Program Managers can help you achieve an efficient and trouble-free installation.

Note: The requirements described in this document apply to Vision[Ai]ry v2.1. Some information in this document may not be applicable to other versions of Vision[Ai]ry. For other editions of this document, contact Ross Video Technical Support.

For More Information About...

- How to install, configure, and operate Vision[Ai]ry, see ***Setup and User Guide for Vision[Ai]ry (5100DR-090-x.x)***.
- Ross Robotics products and accessories, and for product brochures, contact your Ross Video sales representative.

About the Vision[Ai]ry System

Vision[Ai]ry is a Ross Video software solution that enhances existing robotic systems by enabling robotic cameras to automatically correct and maintain video framing.

It reduces camera operator workload by eliminating the need for manual corrections of the camera position to compensate for talent movement such as day-to-day variations in seating position, posture, and talent height.

Vision[Ai]ry is optimized for use in Broadcast News, Weather, and Sports studio broadcasts where the subjects are typically seated at a desk or standing in front of a backdrop or video display. The system automatically adjusts the pan, tilt, and zoom (PTZ) axes of the robotic camera to ensure that the subject is properly framed in the image at all times, based on a configurable framing target.

While viewing live video embedded in the user interface, you can manually select subjects for tracking or let Vision[Ai]ry select them automatically. You can also create and recall framing templates that ensure consistent shot framing.

The heart of the system is the Vision[Ai]ry Engine service, which ingests and analyzes live video from a robotic camera. The Engine uses artificial intelligence (AI) technology to detect and track subjects. Based on choices made by the operator, such as which subject to track and where they should appear in the video frame, the Vision[Ai]ry Engine controls the PTZ axes of the robotic camera to keep talent framed as desired.

5100DR-092-2.1

The Vision[Ai]ry Control service provides easy-to-use interfaces for configuration and channel control, presented within a Ross Video DashBoard client interface. While viewing embedded live video, you can manually select subjects for tracking or let Vision[Ai]ry select them automatically. You can also create and recall framing templates that ensure consistent shot framing.

A Vision[Ai]ry Engine controlled by the Vision[Ai]ry Control service constitutes a Vision[Ai]ry channel. A channel can provide subject tracking and PTZ control for one robotic camera system at a time.

A Vision[Ai]ry system may include a single channel or multiple channels:

- In a single-channel system, you can connect multiple cameras to the channel and use the Channel Control page to operate them one at a time.
- In a multi-channel system, each channel is typically dedicated to a single camera. You can use Channel Control pages to operate any number of individual channels or use the MultiChannel page to control up to six channels simultaneously, showing live video and controls for all six cameras.

A Vision[Ai]ry system includes one or more DashBoard client workstations. In multi-channel systems each workstation can be configured to control one or more channels from a common pool of channels.

To operate Vision[Ai]ry, one software license is required for each channel, which consists of a connection between an instance of the Vision[Ai]ry Control service and a Vision[Ai]ry Engine. The license order number is **RRB-VAI-FT-ENGINE**.

An additional license (**RRB-VAI-BT-ENGINE**) is required for each Vision[Ai]ry channel that will be used to track bodies as well as heads or faces. Body tracking can enhance face or body tracking by providing resilience when the subject turns away from the camera or is otherwise partially obscured.

A separate software license is required for each Vision[Ai]ry workstation that controls the channel. The license order number is **RRB-VAI-FT-CLIENT**.

Architecture of a Single-Channel System

Figure 1 illustrates the basic architecture of a typical single-channel system. In this example, the Vision[Ai]ry Engine and Control services are both installed on the SmartShell computer. A separate Robotics Server, which is part of the existing Ross Robotics system, runs the Routing Service. A single-channel architecture may be suitable for initial trials of Vision[Ai]ry but is not recommended for long-term use.

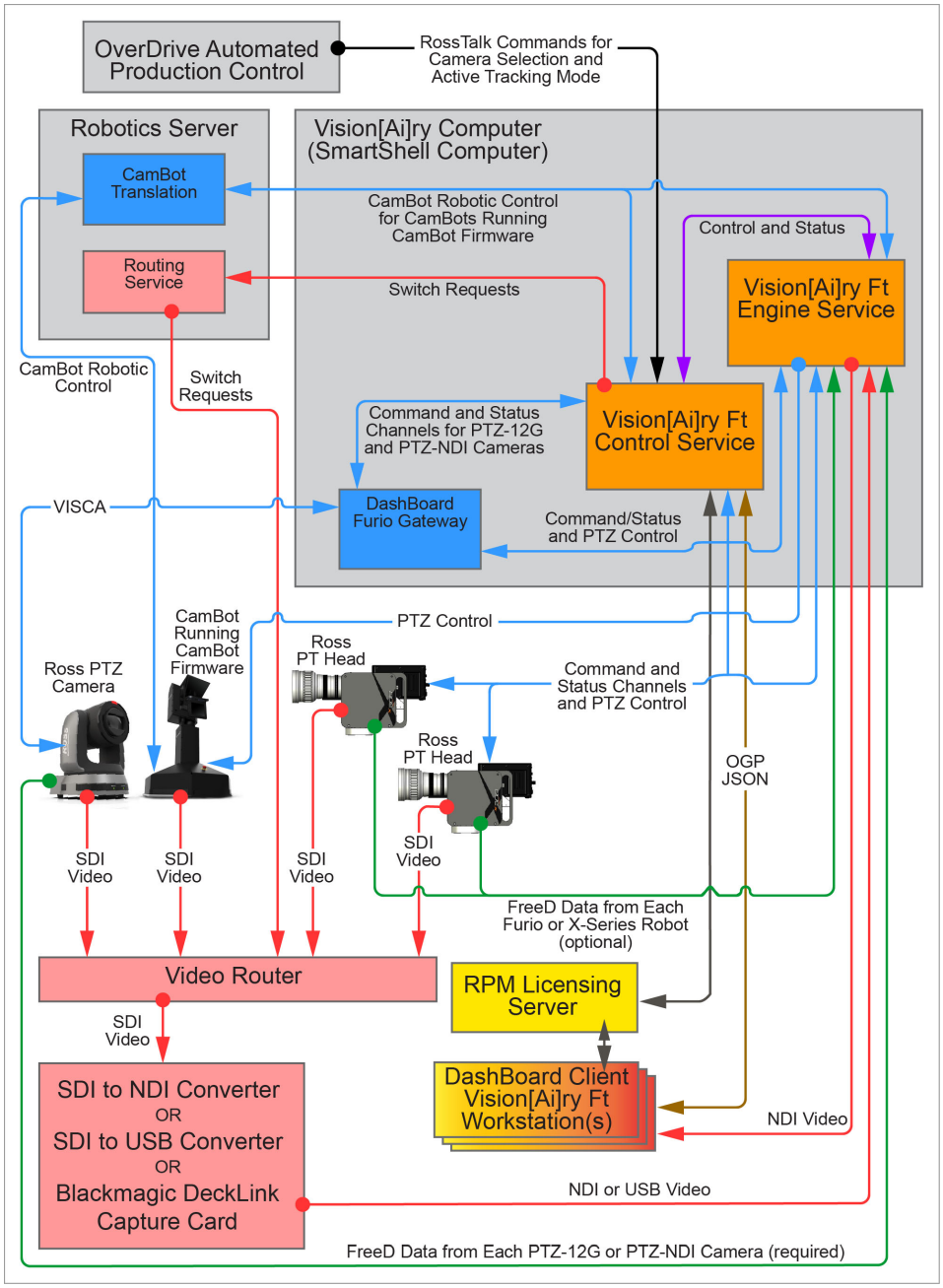

***Figure 1** - Architecture of a Typical Single-Channel Vision[Ai]ry System*

Architecture of a Multi-Channel System

Figure 2 illustrates the basic architecture of a typical multi-channel system. In this example, each of the four cameras is assigned to its own instance of the Vision[Ai]ry Engine service, which runs on a separate dedicated computer. The Vision[Ai]ry Control service is installed on the computer that runs the Robotics Server.

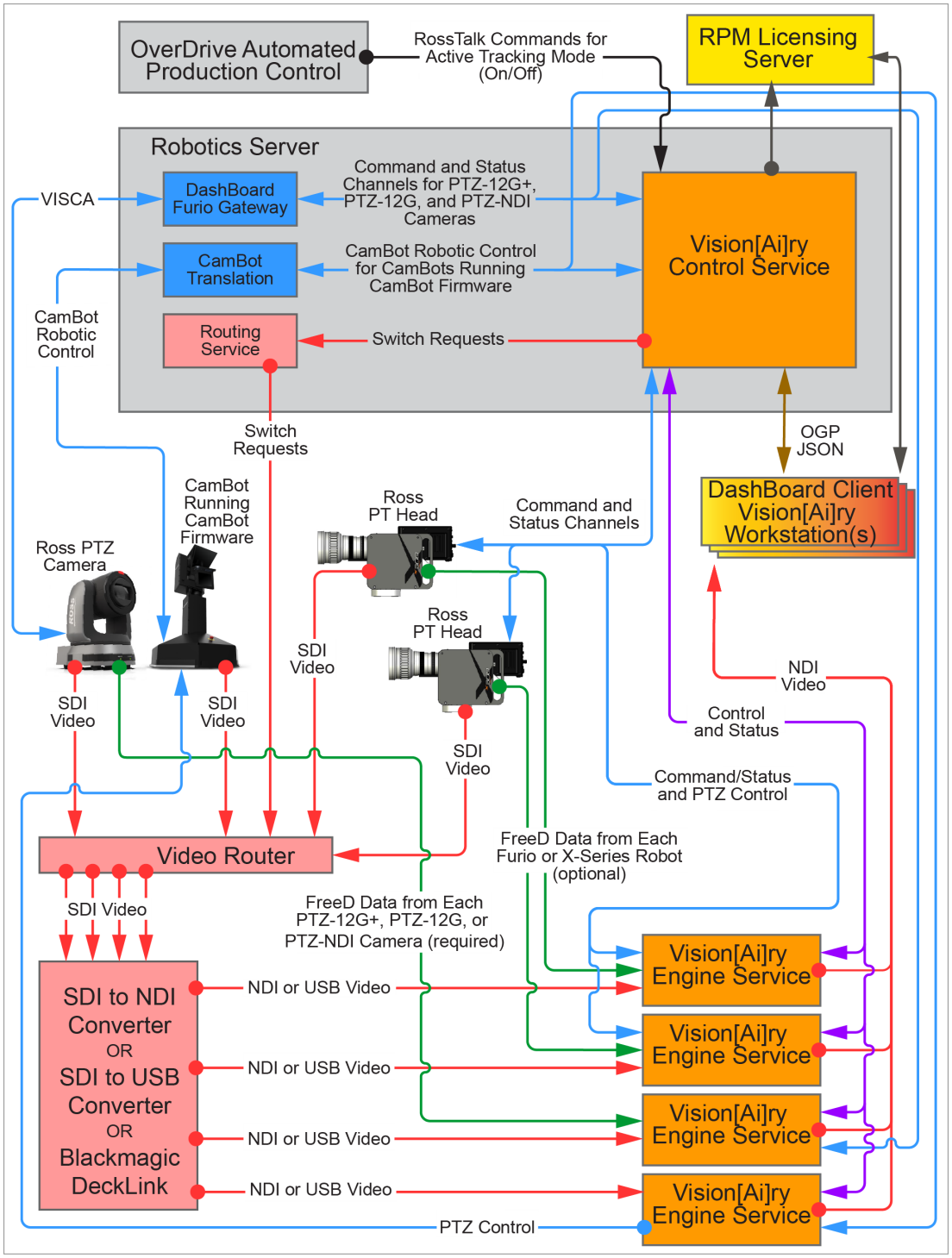

Figure 2 - *Architecture of a Typical Multi-Channel Vision[Ai]ry System*

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Architecture of a Multi-Channel System with Vision[Ai]ry Server(s)

Figure 3 illustrates the basic architecture of a typical multi-channel Vision[Ai]ry system with Vision[Ai]ry server(s).

In this example, there are four cameras and two Engine services running on separate servers, and each Engine has two Channels.

Each camera is assigned to a channel on one of the Engines.

Both Engines connect to the same Control service (Vision[Ai]ry Server 1) which controls the Engines and generates the user interfaces for DashBoard, including the Configuration page, Channel Control pages, and the MultiChannel page.

This system allows all 4 cameras to be controlled at the same time.

X-Series and Furio robots (including CamBot XY Pedestals running Furio firmware) communicate directly with Vision[Ai]ry services, while CamBot robots communicate through a CamBot Translator service. PTZ-12G+, PTZ-12G, and PTZ-NDI cameras communicate via the DashBoard Furio Gateway.

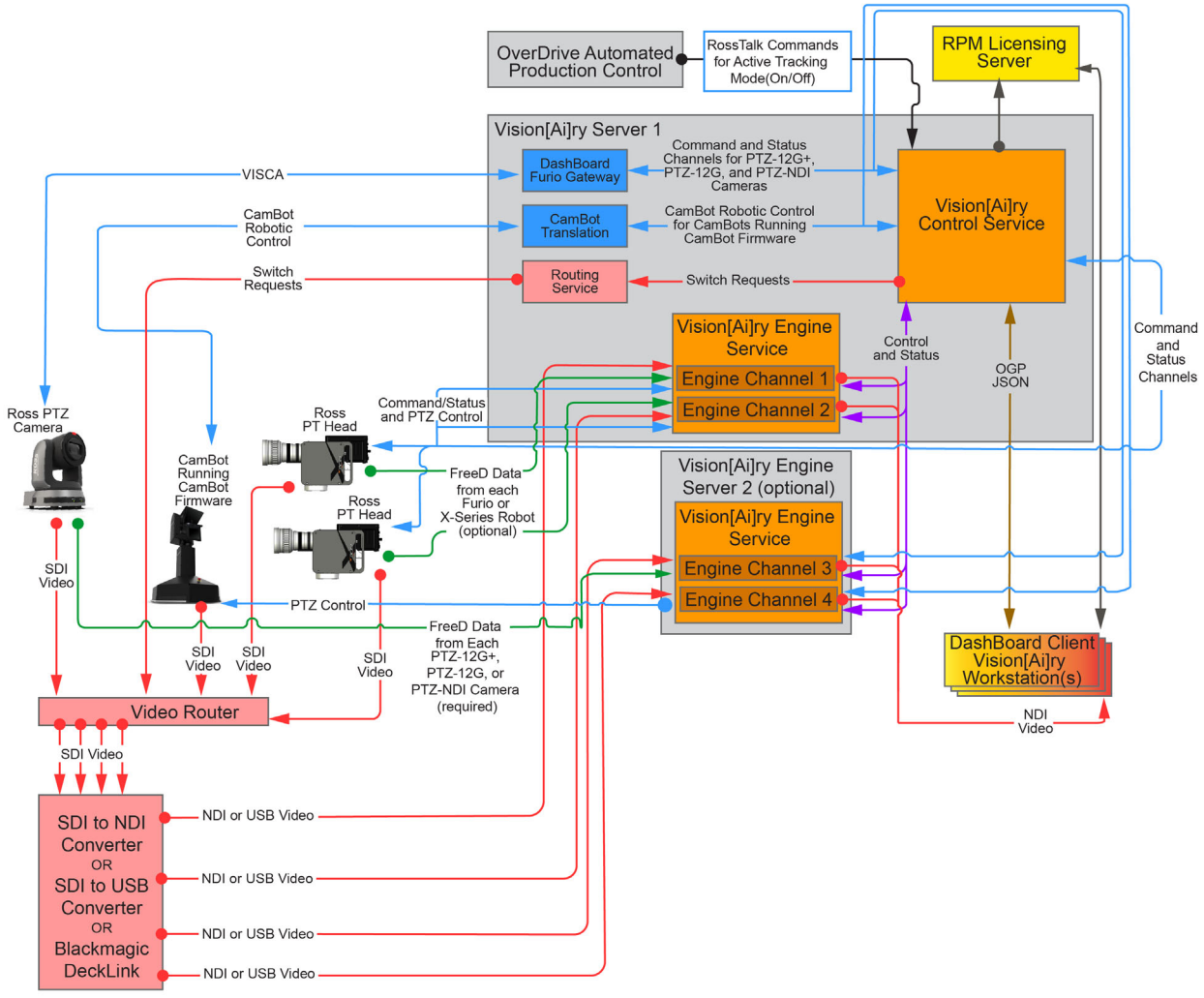

Figure 3 - *Typical Architecture of a Multi-Channel System with Vision[Ai]ry Server(s) that has Four Cameras and Four Engines*

Robot Requirements

Vision[Ai]ry is designed to be added to a working Ross Robotics system. The robots, cameras, and lenses used by Vision[Ai]ry must already be working properly. For example, the system must be able to control the zoom axis of a given robotic camera's lens.

This section describes additional requirements for compatibility with Vision[Ai]ry.

Supported Robots

Vision[Ai]ry is fully compatible with existing Ross robotic camera systems.
For Vision[Ai]ry to control a PTZ camera, DashBoard is required for camera control.
Third-party supported cameras require the **PTZ Camera Control License** for DashBoard

It is designed to control the following robots:

- Ross Video Artimo robotic system.
- All Furio and X-series PT heads, whether standalone or mounted on a Furio Dolly and/or Furio robotic lift. Furio firmware v5.2c (or higher) is required.

  Note: Vision[Ai]ry controls the pan, tilt, and zoom axes only. If the head is mounted to a lift and/or dolly that moves while Vision[Ai]ry is tracking, the system operates the pan, tilt, and zoom axes to continue tracking the subject.
- Ross Video PTZ-12G+, PTZ-12G and PTZ-NDI Cameras.
  Note: It is not possible to use NDI video directly from a PTZ-12G+. While it does offer NDI HX2 and NDI HX3, data rate is fixed at 60fps, which is not supported by Vision[Ai]ry.
- Canon CR-N700 PTZ Cameras
- Panasonic AW-UE160 and AW-UE150 PTZ Cameras
- Sony BRC-X1000 Camera
- CamBot heads (520PT, 600PT, 700PT) that are running CamBot firmware version 3.4.x (or earlier) AND are controlled via a Robotics Server running v5.2e (or higher). Hot fix 5.2.505.8000 is required when using v5.2e. Contact Ross Video Tech Support for more information.
- CamBot heads mounted on CamBot XY free-roaming pedestals when one of the following is true:
  - The pedestal is running Furio firmware v5.2c (or higher).
  - The pedestal is running CamBot firmware AND is controlled via a Robotics Server running v5.2e (or higher). If the Robotics Server is running v5.2e, hot fix 5.2.505.8000 is required.

  Note: Vision[Ai]ry controls the pan, tilt, and zoom axes only. If the lift and/or pedestal move while Vision[Ai]ry is tracking, the system operates the pan, tilt, and zoom axes to continue tracking the subject.

FreeD Data

For all PTZ Cameras, Vision[Ai]ry requires FreeD position tracking data from each camera.

For other supported robotic camera systems, Vision[Ai]ry does not normally require FreeD data. By default, Vision[Ai]ry requests axis position data directly from the robotic head. For some lens models, problems with zoom position data may arise and cause tracking to fail. if this occurs, providing FreeD data from the robot to Vision[Ai]ry may solve the problem.

Note: CamBot heads running CamBot firmware do not provide FreeD data.

About FreeD for PTZ-12G+, PTZ-12G, and PTZ-NDI Cameras

To transmit FreeD data from a Ross Video PTZ camera to Vision[Ai]ry, you must:

- Configure the camera to transmit the FreeD data (**Tracking Data Out** setting in the camera's web interface).
  For more information, see the ***Technical Manual for PTZ-12G+ (5000DR-363-01)*** and the ***Technical Manual for PTZ-12G and PTZ-NDI Cameras (5000DR-353-xx)***.
- Configure Vision[Ai]ry to receive the FreeD data.
  For more information, see ***Setup and User Guide for Vision[Ai]ry (5100DR-090-xx)***.

About FreeD for X-Series, Artimo, and Furio Heads (or CamBot XY pedestals running Furio firmware)

To transmit FreeD data from an X-Series or Furio head (or CamBot XY pedestal running Furio firmware) to Vision[Ai]ry you must:

- Configure the robotic head to transmit the FreeD data.
  Type the IP address of the head into the address bar of a web browser to access the head's web interface. Using the web interface, configure the T**racking** settings to transmit **FreeD** data over **UDP** to the IP address of the computer running the Vision[Ai]ry Engine service.
  Note: You can configure **Tracking** settings to transmit only **one** tracking data protocol at a time (**FreeD** or **ORAD**), to as many as three destinations.
- Configure Vision[Ai]ry to receive the FreeD data.
  For more information, see ***Setup and User Guide for Vision[Ai]ry (5100DR-090-xx)***.

About FreeD for Third-Party PTZ Cameras

Vision[Ai]ry requires FreeD position tracking data from the following supported third-party PTZ cameras:

- Canon CR-N700
- Panasonic AW-UE160
- Panasonic AW-UE150
- Sony BRC-X1000

To transmit FreeD data from a PTZ camera to Vision[Ai]ry, you must:

- Configure the camera to transmit FreeD tracking data using the camera's web interface.
  Refer to the technical manual for the specific camera model for detailed configuration instructions.
- Configure Vision[Ai]ry to receive the FreeD data.
  For more information, see ***Setup and User Guide for Vision[Ai]ry (5100DR-090-xx)***.

Video Routing Requirements

Each Vision[Ai]ry Engine ingests and analyzes live streaming video from one robotic camera at a time. If you want to control more than one camera using a given Engine (still one at a time), as is typical for single-engine systems, video routing is required.

In typical installations, the Vision[Ai]ry Control service sends a switch request to the Routing Service running on the Robotics Server or SmartShell computer. The Routing Service commands the video router to send the required video stream.

If you require Vision[Ai]ry to control video routing, you need a single router that is able to switch the input from any camera to the video format converter dedicated to the destination Engine (channel). The router must already be configured to operate with the Routing Service.

In some installations, video routing can be performed without requests from the Vision[Ai]ry Control service. For example, if routing is performed in conjunction with video routing for the SmartShell monitor, the same video can be delivered to the Vision[Ai]ry Engine.

Vision[Ai]ry Configuration Options

When designing and commissioning a Vision[Ai]ry system, it's important to consider various configuration options that can influence the required hardware and its setup. These decisions will likely depend on the type of shows you're producing and how you intend to use Vision[Ai]ry.

Key configuration options include:

- **Head vs. Face Tracking**: Vision[Ai]ry offers two types of head detection, each with its own set of advantages and disadvantages:
  - **Face Tracking (Default)**: In its default mode, Vision[Ai]ry detects faces by drawing bounding boxes around them. This mode is the most extensively tested and generally performs better when subjects are further from the camera, so that their head size is small compared to the size of the frame.

Figure 4 - *Vision[Ai]ry Face Tracking*

  - **Head Tracking**: When enabled, Vision[Ai]ry detects and draws bounding boxes around the subject's entire head. This provides more consistent bounding box sizes when the subject turns their head or looks down, and is less likely to lose track of the subject if they turn away from the camera. However, this mode is slightly more prone to false detections and is less effective when heads are smaller in the frame.

Figure 5 - *Vision[Ai]ry Head Tracking*

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- **Body Tracking**: Body tracking requires an additional license (**RRB-VAI-BT-ENGINE**) and hardware equipped with a GPU capable of running the body detection algorithm. Body tracking enhances Vision[Ai]ry's capabilities in several ways:
  - **Active Body Tracking**: Vision[Ai]ry corrects for the position of the entire body rather than just the head, which is beneficial when subjects are too far from the camera for head detection or when you want to frame the entire body in the shot.
  - **Simulated Head Projection**: When a head bounding box cannot be detected, Vision[Ai]ry uses the location of the body to project the likely position of the head, maintaining consistent IDs if a subject turns away from the camera, especially while moving. This also enables simulated head tracking.
  - **Simulated Head Tracking**: When a subject's head is not detected but their body is visible, Vision[Ai]ry can continue to pan or tilt to follow the projected position of the subject's head, ensuring smooth movement. This is particularly useful when a subject stands up quickly, causing their head to go out of frame, or when they turn away from the camera while walking.

Computer System Requirements

All computers running software for Vision[Ai]ry must be accessible on the same IP network as the components of the existing Ross Robotics system.

The Vision[Ai]ry system includes the following software components:

- **Vision[Ai]ry Engine** — This software service analyzes live video from a robotic camera to detect subjects, and operates the pan, tilt, and zoom axes of the camera to correctly position a selected subject or subjects within the video frame. If the Vision[Ai]ry engine will be configured for body tracking, a GPU will be required. Refer to "**Minimum System Requirements for Computers Running Vision[Ai]ry Engine**" on page 11.
- **Vision[Ai]ry Control** — This software service works in conjunction with a DashBoard client interface to control the operation of one or more Vision[Ai]ry Engines.

  Vision[Ai]ry Control is typically installed on the SmartShell computer (for single-channel) or the Robotics Server (for multi-channel), but it can be installed on any computer running Windows 10 (or higher).
- **DashBoard Facility Control** — DashBoard is the software application that presents the Vision[Ai]ry configuration and control interfaces. It can be installed on any computer running a currently-available version of Windows.

  You can set up any number of Vision[Ai]ry workstations running DashBoard, but each requires a separate software license from Ross Video to control Vision[Ai]ry.

  Note: Even with multiple Vision[Ai]ry workstations accessing a given Vision[Ai]ry channel, the channel can control only one camera at a time. If multiple operators try to control a single Vision[Ai]ry channel concurrently, each person's actions will interfere with those of the other.

  IMPORTANT: If a computer is running an instance of the Vision[Ai]ry Engine service, do not use it as a Vision[Ai]ry workstation for controlling multiple Vision[Ai]ry channels. Running the Engine service while viewing multiple live video streams on the MultiChannel page may result in suboptimal performance.

  Note: If you view video from multiple Vision[Ai]ry channels using DashBoard installed on a virtual machine (VM) or cloud-based processor, the video may lag and the interface may be slow to respond, unless the computer running DashBoard has additional graphics processing support.
- **Ross Platform Manager (RPM) Licensing Server** — an RPM licensing server, or an internet connection back to the Ross Video Activation Server is required to manage licenses for Vision[Ai]ry 2.0 and higher. Refer to "**Licensing**" on page 15.

Recommended Computer Systems for Running Vision[Ai]ry

If you will only be installing a single Vision[Ai]ry channel and do not require body tracking, Vision[Ai]ry can be installed on a SmartShell computer (refer to Figure 1 from "**Architecture of a Single-Channel System**" on page 3).

For multi-channel deployments, or where body tracking is required, the Vision[Ai]ry Server (***RRB-VAI-SRV***) is the recommended deployment option. This will support up to 4 channels of Vision[Ai]ry along with the Vision[Ai]ry Control Service and optionally the services that run on the Ross Video Robotics Server (refer to Figure 3 from "**Architecture of a Multi-Channel System with Vision[Ai]ry Server(s)**" on page 5). If you prefer to provide your own computer systems, the Minimum System Requirements section below provides details.

In all cases, a separate computer is required to run the **Ross Platform Manager Licensing Server.**

The Vision[Ai]ry hardware server has the following specifications:

- HP Z4 with Intel Xeon w5-2465x 16 cores, 32 GB memory, 1TB SSD data storage
- NVIDIA RTX 4000 ADA 20GB 4DP GFX
- Windows 11 Pro
- BlackMagic DeckLink Duo 2 Card (supports 4 channels of SDI video up to 1080p)

The Vision[Ai]ry hardware server supports the following:

- Vision[Ai]ry engine with up to 4 channels of Vision[Ai]ry body tracking
- SDI or NDI video input at up to 1080p resolution and 60fps
- Vision[Ai]ry Control Service
- Ross Video Robotic Server

Where the Thumbnail service is used with SDI video capture, this will require 1 channel of the SDI video input card, which means only 3 SDI channels will be available for use by Vision[Ai]ry

Minimum System Requirements for Computers Running Vision[Ai]ry Engine

For single-channel systems, the Engine service and Control service are typically installed on the SmartShell computer:

- If you are commissioning a new Ross Robotics system that includes a SmartShell computer from Ross Video, this computer meets the minimum system requirements for Vision[Ai]ry's **Face Tracking** only.
- For **Body Tracking** features, a computer with a GPU is required, meaning the SmartShell computer cannot be used.
- If you are installing the Engine on the Standalone version of the SmartShell computer, which features SmartShell and the Robotics Server components installed on a single computer, you may not need a separate video converter. The Standalone version of the SmartShell computer includes an integrated DeckLink video converter. The video converter can be used to process either thumbnail video or Vision[Ai]ry video, but not both.
- For **Body Tracking** features, a computer with a GPU is required. Refer to "**Minimum System Requirements for Computers Running Vision[Ai]ry Engine**" on page 11.
- Older SmartShell computers may not satisfy the minimum system requirements. To determine your computer's suitability, compare its specifications to those listed in this section, or contact Ross Video Technical Support.
- The Robotics Server computer does NOT meet the minimum system requirements for running the Vision[Ai]ry Engine service.

For multi-channel systems, the Control service is typically installed on the Robotics Server. Each instance of the Engine service must be installed on its own physical computer or virtual machine (VM).

The minimum system requirements for a physical computer running the Vision[Ai]ry Engine for **Face Tracking** only are as follows:

- **Processor**:
  - Minimum: 4 GHz, 12MB cache, 8 cores / 8T (Intel Core i7-9700)
  - Recommended: 4 GHz, 16MB cache, 8 cores / 16T (Intel Core i7-10700)
- **Data Storage (drive)**: 256 GB SSD
- **Operating System**: Windows 10 Pro (64 bit)

The minimum system requirements for a virtual machine (VM) running the Vision[Ai]ry Engine for **Face Tracking** only are as follows:

- **Processor**:
  - Minimum: Xeon E5-2690 - 8 cores
  - Recommended: Xeon Gold 6338 - 12 cores
- **Data Storage (drive)**: 256 GB SSD
- **Operating System**: Windows 10 Pro (64 bit)

To support **Body Tracking**, a GPU that has CUDA drivers must be added to the minimum system requirements above. The minimum recommended GPU is a NVIDIA T1000 8GB or equivalent. Vision[Ai]ry 2.0 was tested with CUDA version 12.0.

To run multiple channels on the same computer, see the specifications for the Vision[Ai]ry server for guidance as to system requirements for up to 4 channels.

IMPORTANT: Configure each computer's power settings such that it does not automatically shut down or go into **Sleep** mode or **Hibernate** mode.

Access to Inbound Network Ports (Firewall Configuration)

The Vision[Ai]ry Control service and the Vision[Ai]ry Engine(s) communicate over a network, and require access to certain inbound network ports.

This may require changes to your facility's network firewall configuration. Such changes must be performed before Ross Video Commissioners arrive to set up Vision[Ai]ry. Approval from your organization's IT department may be required.

For instances of the **Vision[Ai]ry Engine**, access to the following inbound network ports is required:

- Listens to Vision[Ai]ry Control on port 2020 TCP
- Optional - Listens for FreeD data on user defined port(s) (UDP)
- Optional - Receives NDI video stream from a video source:
  - NDI mDNS discovery - UDP 5353
  - NDI management - TCP 5960
  - NDI stream - TCP/UDP/Multi-TCP 5961 to *xxxx* (5960 + stream number)

For **Vision[Ai]ry Control**, access to the following inbound network ports is required:

- Listens to DashBoard on TCP port 5260
- Listens for RossTalk commands on TCP port 7788 (by default; can be configured to use a different port)
- Receives one NDI video stream per channel from the Vision[Ai]ry Engine:
  - NDI mDNS discovery - UDP 5353
  - NDI management - TCP 5960
  - NDI stream - TCP/UDP/Multi-TCP 5961 to *xxxx* (5960 + stream number)

Video Transport and Supported Video Formats

The Vision[Ai]ry Engine ingests live streaming video from a robotic camera. The video must be converted to a format that the Engine can process.

Video Transport

The Vision[Ai]ry Engine can accept an NDI video stream or any video stream managed by the Engine computer's operating system and exposed as a system device. When using SDI cameras, video can be ingested using an external SDI-to-NDI converter, an external SDI-to-USB capture device, or an internal SDI capture card installed in the Engine computer.

For more information about NDI technology, supported tools, and licensing details, visit https://ndi.video/. NDI® is a registered trademark of Vizrt NDI AB.

The live video stream can be delivered from the router to the Vision[Ai]ry Engine using the following methods:

- **NDI video**, via the IP network, to the Vision[Ai]ry Engine.

  The NDI source must be visible to the Engine computer on the IP network.

  NDI video streams require significantly less bandwidth than uncompressed video streams of the same format.

  To convert SDI video to NDI video, Ross Video recommends either of the following:

  › **Ross softGear Streaming Gateway**. (www.rossvideo.com/remote-production/streaming-devices/softgear)

  › The **Magewell® Pro Convert SDI TX** converter (www.magewell.com/products/pro-convert-sdi-tx). Magewell® part numbers for this converter vary by country: 64060 US; 64062 EU; 64063 UK; 64064 AU; 64065 KR; 64066 JP).

- **USB video**, via a USB port on the Engine computer.

  To convert SDI video to a USB video stream, Ross Video recommends the **Magewell® USB Capture SDI Gen 2** (www.magewell.com/products/usb-capture-sdi-gen-2). The Magewell® part number for this device is **32070**.

- **Blackmagic DeckLink video capture card** installed on the Engine computer.

  The minimum supported DeckLink software version is v12.2.

  Note: A given channel of a video capture can be used to process either thumbnails for SmartShell, or video for Vision[Ai]ry, but not both.

Supported Video Formats

The Vision[Ai]ry Engine can accept a wide range of video formats. This video is analyzed by the Engine to detect and track subjects. The Engine also provides it to the Vision[Ai]ry workstation(s) as an NDI video stream for display on the control page.

Supported video formats:

- **NDI (full bandwidth):** 1920x1080 up to 60 fps
- **NDI HX is not supported**
- **NDI HX2:** 1920x1080, up to 30 fps, maximum bitrate 2Mbps
- **NDI HX3:** 1920x1080, up to 30 fps, maximum bitrate 2Mbps
- **USB capture device:** 1920x1080, up to 60 fps
- **Blackmagic DeckLink:** 1920x1080, up to 60 fps

Note: Both progressive and interlaced formats are supported.

Note: The 30 fps limitation applies only to NDI HX2 and NDI HX3. Full-bandwidth NDI, USB capture devices, and Blackmagic DeckLink cards support up to 60 fps.

Note: The NDI High Bandwidth output by the PTZ-12G+ does not work with Visionairy, despite Visionairy supporting NDI High Bandwidth from other sources. Also, the PTZ-12G+ fixes the NDI HX2 and NDI HX3 framerate to 60fps, which Visionairy does not support.

Note: To pair PTZ-12G+ with Visionairy, either use SDI or transcode the NDI output to a compatible format.

Recommended Settings

To reduce network and engine load:

- Use the lowest practical **resolution**, **frame rate**, and **bitrate** while maintaining adequate image quality.
- Use the minimum supported format of at least **640** × **360** at **10 fps** progressive.
- Use a frame rate divisible by 10 (e.g., 30 or 60 fps) for optimal analysis performance.

Note: Most video capture devices and NDI sources support configuration of resolution, frame rate, and bitrate.

Head and Lens Calibration Profiles

Each combination of a specific model of robotic head controlling a specific model of lens results in unique performance characteristics. Vision[Ai]ry operates the zoom axis of the lens. To ensure smooth and accurate tracking throughout the zoom range of the lens, calibration is required.

A head/lens calibration profile provides information to the Vision[Ai]ry Engine about the performance characteristics of a given head and lens combination.

When you add a supported PTZ camera in Vision[Ai]ry, the required calibration profile is automatically applied.

For other robotic camera systems, calibration profiles to support various head/lens combinations are available from Ross Video Technical Support. You can apply an appropriate profile when you configure a camera on the Vision[Ai]ry configuration page.

If a head/lens profile does not yet exist for your specific head/lens combination, a Ross Video commissioner can create one on-site. This task cannot be completed by a customer.

For information about existing profiles, contact Ross Video Technical Support.

Licensing

Vision[Ai]ry v2.0 and higher utilize software-based licensing and require a connection to either a Ross Platform Manager (RPM) licensing server or the Ross activation server. The RPM licensing server license is available free of charge, but you will need a computer to install it on (**RPM-Express**, a server sold by RPM).

Note: If your setup requires servers to not be connected to the internet, RPM supports checking out a permanent license through Offline License Activation (OLA).

For more details on requirements and installation, refer to the RPM Windows Installation Guide on the Ross Video website.

Pre-Commissioning Checklist

Ensure all components and configurations are ready for a successful Vision[Ai]ry installation by using the checklist below:

Category	Checklist Item	Complete
Hardware Identification	1) Ensure hardware is available to install all Vision[Ai]ry components	
	2) Verify hardware meets the **minimum system requirements** (CPU, GPU for body tracking, SSD storage)	
	3) How will the system be configured: **single-channel** or **multi-channel** architecture?	
Video	4) Confirm how video will be routed to the engines: is the Routing Service on the Robotics Server required?	
	5) Verify how video will be input to the engines (e.g., **NDI** or **SDI** via a video converter)	
	6) Select appropriate video converters (e.g., **Magewell Pro Convert SDI TX**, **USB Capture SDI Gen 2**, **Blackmagic DeckLink**) if SDI conversion is needed	
Configuration Options	7) Check whether **Body Tracking** is required and that the appropriate licenses have been purchased and hardware supports it (body tracking requires additional licensing)	
	8) Select whether Face Tracking should use **Face-Only** bounding boxes or **Full-Head** bounding boxes depending on production needs	
Licensing	9) Confirm where the RPM Licensing server will be installed (locally or connecting to Ross Activation Server)	
	10) Have the product keys been obtained	
	11) Determine if offline licensing is required: RPM v3.7 supports offline mode, allowing the use of an offline tool to check out licenses from the Activation Server and apply them to the RPM server?	

Category	Checklist Item	Complete
Cameras	12) Ensure the robotics system, robots, and cameras are set up and commissioned	
	13) Verify whether required calibration files exist, or will need be to generated by a Ross Video commissioner	
	14) Confirm how position data will be sent to the engines (FreeD for any PTZ cameras)	
	15) Have the **Lens Calibration** images printed and available in case a calibration is necessary	
Network	16) Ensure all required network ports are accessible through the firewall (refer to "**Access to Inbound Network Ports (Firewall Configuration)**" on page 12)	