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1.0 Scope

This document provides guidelines for installing CaseCracker Onyx (CCO) equipment in interview rooms. Comments are welcome.

2.0 Room Overview

The figure below shows the wiring of a typical interview room. The devices and wiring required are described in detail in the following sections.
3.0 Wiring

The typical interview room setup illustrated above uses the following wiring:

<table>
<thead>
<tr>
<th>Code (see diagram)</th>
<th>Name</th>
<th>Provider</th>
<th>Max Length</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Contact Closure</td>
<td>Installer</td>
<td>10 meters</td>
<td>18 awg, 1 pair, plenum rated. Note: Flag switch must be 22 awg.</td>
</tr>
<tr>
<td>B</td>
<td>USB</td>
<td>Installer</td>
<td>5 meters</td>
<td>Standard USB 2.0 cable, plenum rated.</td>
</tr>
<tr>
<td>C, C’</td>
<td>Ethernet</td>
<td>Installer</td>
<td>100 meters</td>
<td>Cat-5e or better, plenum rated. Cables marked C’ support Power over Ethernet.</td>
</tr>
<tr>
<td>D</td>
<td>Camera Sensor</td>
<td>CPT*</td>
<td>8 meters</td>
<td>This is an Axis proprietary 6-conductor cable that terminates into the Camera Main Unit using an RJ12 connector and is supplied with each camera.</td>
</tr>
<tr>
<td>P</td>
<td>Power</td>
<td>Installer</td>
<td>50 meters</td>
<td>16 awg, 1 pair, plenum rated.</td>
</tr>
</tbody>
</table>

* Cardinal Peak Technologies

4.0 Devices

The typical interview room setup illustrated above uses the following devices. Cardinal Peak Technologies provides each device, except for DIN rail mounts and racks for the power supplies.

<table>
<thead>
<tr>
<th>Device (see diagram)</th>
<th>Quantity</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Room Controller      | 2 per room | About: The Room Controller contains industry standard hardware, and performs the following functions:  
- Receives uncompressed audio from the microphones and formats that audio, still uncompressed, for streaming across the recording LAN.  
- Provides breakouts to the wall switch, the recording lights, and the flag switch.  
- Contains the Room Controller power-over-Ethernet switch, as an installation convenience, so the IP cameras can be directly connected to the Room Controller and thus only two Ethernet drops are required per room, one per controller.  
Install Location: Mount outside the interview room, either high on the wall but below the ceiling, or hidden from view above the drop ceiling.  
Install Notes: Mount the Room Controller horizontally or to a vertical surface with all connectors pointing up. There are four 0.250” key-hole openings for mounting, which can mount to screws directly. The controller may also be mounted using the flanges. See section 8.2 Room Controller Connections for wiring configurations.  
Two Room Controllers are provided for redundancy. In this configuration, each microphone and each IP camera is wired to a different Room Controller, with one of the Room Controllers also being wired to the recording lights, the start/stop switch, and the flag switch. The wiring for the recording lights, the start/stop switch, and the flag switch can be wired to either controller.  
Specifications: Metal enclosure measuring 10.4” x 7.3” x 2.0” with an off-white powder coat finish. Plenum rated. |
<table>
<thead>
<tr>
<th>Device (see diagram)</th>
<th>Quantity</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Ceiling Mounted Microphone | 1 per room | **About:** One of two microphones in the system.  
**Install Location:** Ceiling near the interview subject.  
**Install Notes:** Each microphone must be connected to a separate Room Controller for redundancy using USB at a distance no greater than 5 meters long. See section 8.2 Room Controller Connections for wiring configurations.  
**Specifications:** The Verifact A is in a cylindrical housing that is 4” in diameter and 1.4” high. |
| Wall Mounted Microphone   | 1 per room | **About:** One of two microphones in the system.  
**Install Location:** Wall between the interviewer and the interview subject, at approximately face level when seated.  
**Install Notes:** Each microphone must be connected to a separate Room Controller for redundancy using USB at a distance no greater than 5 meters long. See section 8.2 Room Controller Connections for wiring configurations.  
**Specifications:** The Verifact D is wall mountable in a rectangular wall plate housing that is 2.5” wide and 4.5” high. |
| Start/Stop Switch         | 1 per room | **About:** Momentary contact switch mounted that starts or stops a recording.  
**Install Location:** Outside the interview room near the door. In some situations the switch may be mounted inside the interview room.  
**Install Notes:** See section 8.3 Start/Stop Switch Connections for wiring configurations.  
**Specifications:** Switch is in a 1-gang electrical box. |
| Interior Recording Light  | 1 per room | **About:** A discreet LED that indicates to the interviewer that a recording is in progress.  
**Install Location:** One of several locations in the room including:  
- In the wall plate containing the connection for the flagging switch.  
- In its own wall plate near the door.  
- Inside the camera housing mounted near the ceiling  
**Install Notes:** See section 8.2 Room Controller Connections for wiring configurations.  
**Specifications:** N/A |
| Exterior Recording Light  | 1 per room | **About:** An illuminated “In Use” sign to warn others that a recorded interview is in progress.  
**Install Location:** On the wall in the hallway outside the interview room.  
**Install Notes:** See 0  
**Specifications:** N/A |
<table>
<thead>
<tr>
<th>Device (see diagram)</th>
<th>Quantity</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Flag Switch         | 1 per room | **About:** Momentary contact switch that when pressed places an index flag in the video recording.  
**Install Location:** Underneath the table near where the interviewer sits. See 8.5 Flag Switch Connections for wiring configurations.  
**Install Notes:** Should be easily accessible for the interviewer.  
**Specifications:** N/A |
| Gigabit Ethernet Switch | 1 per Site | **About:** Connects the Room Controllers to the server.  
**Install Location:** Control room.  
**Install Notes:** Connect this network switch to the recording LAN port on the back of the server. Only the Room Controllers s and the server should be connected to this switch.  
**Specifications:** Gigabit Ethernet Switch |
| Server (not pictured) | 1 per Site | **About:** Controls and saves interviews for each location.  
**Install Location:** In a secure room designated at each individual location.  
**Install Notes:** There are two different size servers, a small or medium. The small server handles up to two rooms and the medium server handles up to eight rooms.  
**Specifications:** Supermicro SYS-5019S-M |
| Control Monitoring WorkStation (not pictured) | 1 per Site | **About:** Computer and software used configure network equipment and to burn interviews to disc.  
**Install Location:** Control room or somewhere outside the interview room.  
**Install Notes:** See section 7.0 Control Monitoring Workstation Setup  
**Specifications:** Includes a Dell workstation, monitor, keyboard/mouse, and a Blu-ray burner. Blu-ray burning software, Google Chrome, and VLC video viewer software are pre-loaded CMW. |
| Power Supply | Varies based on site-specific requirements | **About:** Provides power to the Room Controllers. Each controller in a single room must be connected to a separate power supply. Do not daisy-chain the power. The connection must go straight from the power supply to the Room Controller. The number of power supplies for each installation varies based on the site survey.  
**Install Location:** Control room.  
**Install Notes:** There are multiple sizes of power supplies available; all standard models should be affixed to a DIN rail for proper ventilation. The supplies must be connected to building power. At the customer’s discretion, all power supplies can be connected to UPS backup. This is only recommended if the building lights inside the interview room are also protected using backup power. The power supplies require an appropriate ROJ power cord. The install team supplies the power cord as the length varies from site to site and the plug varies for international locations.  
**Specifications:** The power supplies produce 48 VDC and are capable of powering multiple Room Controllers (exact count depends on the model). |
### 4.1. Standard Camera Configuration

The standard configuration for video recording in an interview room consists of two cameras. A full room view camera and a wall view camera. To provide redundancy protection, one camera is routed through one Room Controller and the second camera is routed through the second Room Controller.

<table>
<thead>
<tr>
<th>Device</th>
<th>Quantity</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Covert Full View Camera | 1 per room | **About:** A camera in a discreet housing that provides a full room view.  
**Install Location:** Mounted in a corner between 6.5 and 8 feet (2.0 to 2.5 meters) from the floor, near the ceiling, ensuring the view includes as much of the room as possible including the interviewer, subject, and door.  
**Install Notes:** Do not mount the camera where the view is blocked with the door open position or where the door could strike the camera. The camera comes with a detachable 8-m (26 ft) cable for connecting the sensor unit to the main unit.  
See section 8.2 Room Controller Connections for wiring configurations.  
**Specifications:** AXIS F1004 Pinhole Sensor Unit, comprising a lens and image sensor, and AXIS P12 Mk II Main Unit, which is the body of the camera. Each P12 Mk II main unit measures: 16.5 x 46 x 109 mm (5/8 x 1 13/16 x 4 5/16 in) and should be mounted above the ceiling tiles. Mounting hardware is provided. |
| Covert Wall View Camera  | 1 per room | **About:** A camera in a discreet housing that provides a face view of the interview subject.  
**Install Location:** 4 to 4.5 feet (1.25 to 1.37 meters) from the floor, directly across from the interview subject.  
**Install Notes:** See section 8.2 Room Controller Connections for wiring configurations.  
The camera comes with a detachable 8-m (26 ft) cable for connecting the sensor unit to the main unit.  
**Specifications:** AXIS F1004 Pinhole Sensor Unit, comprising a lens and image sensor, and AXIS P12 Mk II Main Unit, which is the body of the camera. Each P12 Mk II main unit measures: 16.5 x 46 x 109 mm (5/8 x 1 13/16 x 4 5/16 in) and should be mounted above the ceiling tiles. Mounting hardware is provided. |

### 4.2. Optional Cameras

Your installation may also include the following optional cameras. These cameras are not pictured in the overview illustration.

<table>
<thead>
<tr>
<th>Device</th>
<th>Quantity</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Dome Camera | Depends on configuration  | **About:** An overt option for a full aerial room view.  
**Install Location:** Corner of the room near the ceiling.  
**Install Notes:** The camera view should include as much of the room as possible including the interviewer, interview subject, and the door to ensure a good “scene-view” of the room.  
Do not mount the camera where the view is blocked with the door open or where the door could strike the camera.  
**Specifications:** Axis P3225-V network camera in a dome style housing. The P3225-V components are all housed inside the unit, not requiring a separate main unit. |
<table>
<thead>
<tr>
<th>Device</th>
<th>Quantity</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Overt Camera Sensor Unit| Depends on configuration | **About:** An overt camera for a full aerial room view.  
**Install Location:** Corner of the room near the ceiling.  
**Install Notes:** The camera view should include as much of the room as possible including the interviewer, interview subject, and the door to ensure a good “scene-view” of the room.  
Do not mount the camera where the view is blocked with the door open or where the door could strike the camera.  
**Specifications:** Axis F1015 sensor unit in a bullet style housing. |
| Overt Camera Main Unit  | 1 per sensor unit         | **About:** TBD  
**Install Location:** Main unit above the ceiling tiles.  
**Install Notes:** N/A  
**Specifications:** Axis F1015 Camera Sensor Unit connected to an Axis F41 Camera Main Unit, Each F41 Main unit measures 51 x 121 x 121 mm (2 1/16 x 4 12/16 x 4 12/16 in). |

### 5.0 Installation Order

For proper installation, install the CaseCracker Onyx (CCO) equipment in the following order:

1. Install the CCO Server, ensuring that the date, time, and time zone are set correctly.
2. Install the UPS and connect the CCO server and Gigabit Ethernet Switch.
3. Install the Control Monitoring Workstation (CMW) and ensure that the computer’s time is in sync with the server.
4. Remove the Phoenix Connectors from the Room Controller.
5. Install cameras and microphones in the room.
6. Install Room Controllers in the room.
7. Attach all microphones and cameras using USB or Ethernet connections to the Room Controller.
8. Attach the wiring for the external exterior recording light, the interior LED, flagging switch, start/stop switch, and power to the appropriate Phoenix Connectors.
10. Plug in power supplies for the Room Controllers after the wiring for the room has been completed and the wiring for each controller attached to the power supply is complete.

**Important!** Minor sparking may occur when attaching the power connection to the Room Controller if the power supplies are already plugged in.

11. Unlock Storage from the **Console** tab on the **Set up** page using the CMW.
12. Complete the room setup on the CMW.
13. Run the Cleanup Database feature from the **Config** tab on the **Set up** page.
6.0 Setting the Server Date, Time, and Time Zone

Ensure that the server has the correct time and date for your location. Each is set from the command line using the following commands:

Example command to set the date and time:
```
date -s "27 APR 2017 11:14:00"
```

Example command to set the time zone:
```
cp /usr/share/zoneinfo/America/New_York /etc/localtime
```

7.0 Control Monitoring Workstation Setup

The CMW runs the CaseCracker software, which is used to setup rooms and manage recordings. Ensure that the workstation’s time is in synch with the server and launch the CMW software to ensure it is installed correctly.

To synch the workstation time with the server:
1. On the workstation, right-click on the time in the lower right corner.
2. Select Adjust date/time.
3. Scroll to the bottom of the page and select Additional date, time, & regional settings.
4. Select Set the time and date and select the Internet Time tab.
5. Click Change settings and select the Synchronize with an Internet time server option.
6. In the Server field, enter the IP address of the CaseCracker server. For example, 192.168.1.1.
7. Click Update now.

To launch the CaseCracker software:
1. From the Windows task bar, open File Explorer.
2. Select Network from the list on the left.
3. Erase network from the text bar at the top and enter “\" followed by the IP address for the server for example \192.168.1.1.
4. Right-click the CaseCracker folder and select Create Shortcut to add it to the desktop.
5. Open the folder and run the application (it may take a minute to load).

You may be prompted with a security warning about running the application. Continue through the warning to launch the software.
8.0  Detail Wiring Configurations

The following sections provide illustrations to wire and connect the devices in the installation.

8.1.  Server Connections

8.2.  Room Controller Connections
Note the following about the above diagram:

- Connect all lights/switches to the correct pins within the terminal block shown.
- For optimal sound quality, do not place microphones in the ceiling directly below an HVAC system.
- USB cables should not exceed 5 meters in length.
- Terminal block tighten torque is .22 Nm minimum and .25 Nm maximum.
- Ensure the sensitivity switch (N/L) on the back of the microphones is in the N position, which is the default position.

8.3. Start/Stop Switch Connections
8.4. Power and Exterior Recording Light Connections

**WARNING!** The Room Controller must be powered using a 48-50 VDC, or damage to the Room Controller could result. Before attaching power, test the voltage at the Room Controller end of the power cable with a voltmeter. Connect the power supply to the wall after all devices are attached to the controller.

Note the following about the above diagram:

- Terminal block tighten torque is .22 Nm minimum and .25 Nm maximum.
- The Power Supply requires the standard ROJ power cable that the install team provides.
- The same physical hardware is used for the 120VAC signs. L is +12VDC and N is ground.

The following photographs shows the internal wiring of the external sign:
8.5. Flag Switch Connections

- A standard 3.5mm phone jack connection is used to protect the wiring in case of accidentally pulling the flag switch from the wall.
- The wire from the keystone wall jack to the Room Controller must be 22 awg and must connect to the correct pins in the terminal block (SW1), as shown.
- Connect the cable to the common and NO terminals on a single side of the flag switch. Polarity does not matter.
- Terminal block tighten torque is .22 Nm minimum and .25 Nm maximum.
- Wire the flag switch as normally open (NO).

The following is a photograph of the internal wiring of the keystone wall jack:
9.0 Room Setup Procedures in CaseCracker Onyx

Complete all of the following steps immediately after the install of each individual room. It is recommended that you set up one room at a time.

9.1. Creating a Room

First, create the room in CCO client.

1. Go to the Setup page.
2. Select the Rooms tab.
3. Select Add New Room.
4. Enter the room name using the following format: FO-RA-Room ID.
   The customer dictates the room ID to comply with fire code.
5. (Optional) Enter a detailed description of the room in the box. This is additional information only and is for administrative value.
6. Select Create Room.

Note: To edit a room name you must delete and recreate it.

To delete a room:

1. Go to the Setup page.
2. Select the Rooms tab.
3. Select Delete.
4. Confirm the deletion.

9.2. Discovering Devices

1. After the room is created, select the Devices tab.
2. Select Discover.
   All cameras, microphones, and Room Controllers installed that are not assigned to a room display in the Unassigned Devices field.

9.3. Assigning Room Controllers to a Room

Room Controllers are identified as “Room Controller”. Each Room Controller comes pre-labeled with its MAC address physically located on the outside of the Room Controller.
Complete the following steps for each Room Controller in the **Unassigned Devices** field:

1. Select the desired room from the drop-down menu.
2. Select the Room Controller from the **Unassigned** field and click **Assign**.
   
   This moves the device from the unassigned list to the room selected from the drop-down menu.
3. After each Room Controller is assigned, select the controller and select the **Rename** option from the pop-up menu.

   The device name should appear as: FO-RA-Room ID-Device ID.

### 9.4. Initializing Cameras

Cameras are identified as a “Capture Device”. Their URI always contains the word **axis**. The rtsp URI may vary.

![Capture Device](image.jpg)

Complete the following steps for each camera:

1. Select the camera you want to initialize.
2. Select **Web** from the pop-up menu (must use Google Chrome or Mozilla Firefox).
3. When prompted, enter the login credentials:
   
   The username is "root".
   
   The password is chosen by the user. Each camera can have the same password. Passwords are case sensitive.
4. Select **Basic Setup** then select **Users**.
5. Select the **Enable anonymous viewer login** option and click **Save**.
6. Select **Video Stream** under **Basic Setup**.
7. Set the limit on maximum frame rate to **30FPS** and click **Save**.
8. Select **Video Stream**, locate the **h.264** tab, and set maximum bitrate to **1500**.
   
   If there are any issues with the picture, configure the settings under the video settings (i.e. rotate camera image).

### 9.5. Assigning Cameras to a Room

When adding multiple devices to a room, the order dictates which image is the default full screen image and which is the picture-in-picture. The first one is the default full screen image and used for the preview on the **Rooms** page.
Complete the following steps for each camera:

1. Select the room from the drop-down menu.
2. Select the camera from the Unassigned field and click Assign.
   This moves the camera from the Unassigned field into the room selected from the drop-down menu.
3. After each camera is assigned, select the camera and select Rename from the pop-up menu.
   The device name should appear as: FO-RA-Room ID-Device ID. Device ID is camera location, for example, wall camera.

   Note: If you are installing the P3225-V dome camera, CCO recognizes multiple camera streams from the P3225. Assign the “Camera 1” feed to the room and ignore the rest of the streams.

9.6. Assigning Microphones to a Room

Microphones are identified as a “Capture Device”. Their URI ends with “codec”.

Complete the following steps for each microphone:

1. Select the room from the drop-down menu.
2. Select the microphone from the Unassigned field and select Assign.
   This moves the microphone from the unassigned list into the room selected from the drop-down menu.
3. After each microphone has been assigned, select the microphone and then select Rename from the pop-up menu.
   The device name should appear as: FO-RA-Room ID-Device ID. Device ID is microphone location, for example wall mic.

   Note: The portion of the URL after the last / may vary.

9.7. Unlocking Storage

   Note: Unlock the system storage every time the server is rebooted.

1. Go to the Setup page and select the Console tab.
2. Select Connect To Server.
3. When prompted, enter the login credentials:
   The username is “root”.
   The default password is “welcome”.
4. From the drop-down menu select Unlock Storage.
5. When prompted, enter the default password of “welcome”.

During installation, change the storage password to a customer-designated password. The customer should change the password.

9.8. Adjusting Audio Gain

1. Go to the Setup page and select the Devices tab.
2. Click the microphone and select Web from the pop-up menu.
   You are redirected to the webpage for the configuration.
3. The audio gain control is located inside the red box as shown below:

   ![Diagram of audio gain control]

If there is more than one microphone attached to a Room Controller they both display on this page.

4. Each microphone is identified by CODEC or CODEC_# on this page. MIC IDs correlate to the text after the last “/” on the URL in the Devices tab.

   ![URL example]

   The audio gain control is set to 4 by default.

   This can be changed from any number between 0-16. The gain should be set as low as possible and still be able to hear a whisper.
9.9. **Rebooting Instructions**

**Important!** Only reboot the server when advised by the Cardinal Peak Tech team.

1. Go to the **Setup** page and select the **Console** tab.
2. Select **Connect To Server**.
3. When prompted, enter the login credentials:
   - The username is “root”.
   - The default password is “welcome”.
4. Select **Action**.
5. Select **Reboot Server** from the drop-down menu.
6. After the system reboot is complete, go to the **Console** tab, log in to the server again, and select **Action**.
7. From the drop-down menu select **Unlock Storage**.
8. When prompted, enter the default password of “welcome”.
   During Installation, change the storage password to a customer-designated password. The customer should change the password.