RUSHWORKS VDESK, REMO and Ctrl+R Production Systems with enhanced PTZ camera control provide dozens of points-of-difference for video producers needing to capture multi-camera shows using a single operator.

Ctrl+R is a simple, easy-to-use but powerful PTZ control system that lets you name, save and recall up to eight (8) presets per camera. It includes advanced features like **Dynamic Auto Zoom** which lets you keep your presets continually in motion for enhanced production value. It also includes motion presets that let you define the start, end and duration for a preset move.

When used with the **RUSHWORKS 3N1** multi-function camera, your options expand dramatically. Along with the named and saved presets, you can switch to and from Auto-Track mode at any time, and the camera will follow the primary subject in your production. The system uses motion detection and image recognition to track an object. To optimize the results, the following procedures are required:

System Operation

For best results, the camera should be positioned in the rear center of the room, between 30' and 50' from the front coverage area, and between 6' and 8' from the base of the fixture to the floor.

6' - 8' (1.8 - 2.5m)

30' - 50' (9 - 15m)
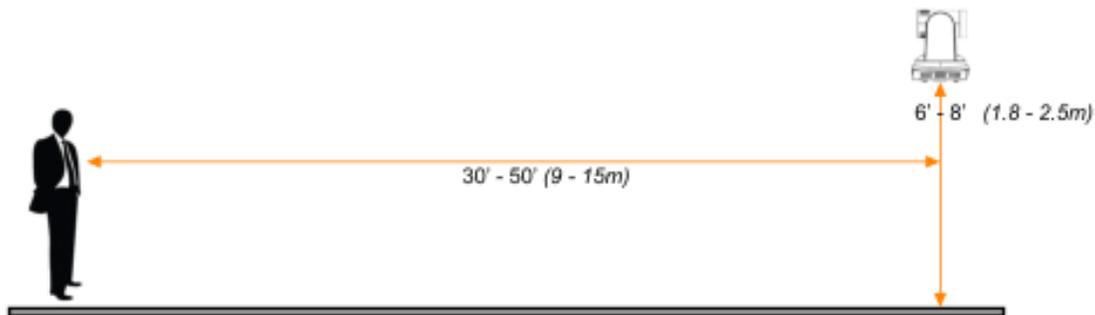
System Connections

This diagram indicates the physical connections available on the 3N1:

3. LAN network port for wide angle lens

4. SDI output 1 (wide angle lens output)

5. SDI output 2 (PTZ lens output)

6. RS-232 control port

7. Audio input port

8. LAN network port for PTZ lens

9. Power supply port (DC12V)

3 4   5 6 7 8 9
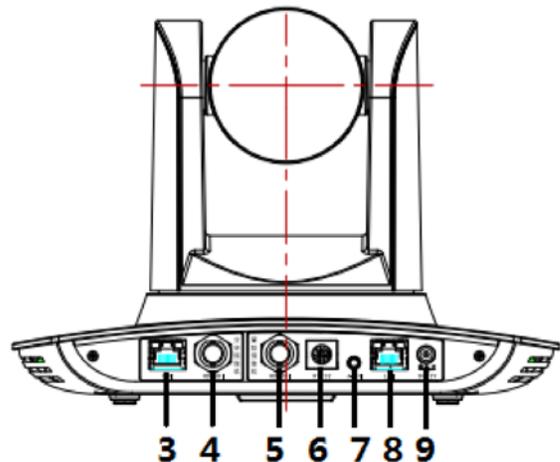
Configuring the Camera

When you open Ctrl+R you'll see a single camera panel and the vertical menu bar.
(Refer to the **Ctrl+R User Guide** for comprehensive operational information.)

The TRACK button will NOT be active.

If you are controlling the 3n1 via Serial:
Be sure the 3N1 is connected to a serial com port, then click the **CONFIG** button. Select the **Manufacturer: RUSHWORKS**, **Model**: **3n1 PTZ**, Interface: **Serial**. Choose the Com **Port** and **Baud Rate** (**115200**).

If you are controlling the 3n1 via IP:
Be sure the 3N1 is connected to a network switch (IP), then right-click and select **Configuration** from the dropdown menu. Select the **Manufacturer: RUSHWORKS**, **Model**: **3n1 PTZ**, **Interface: IP** from the dropdown, and enter the camera IP Address in the window.
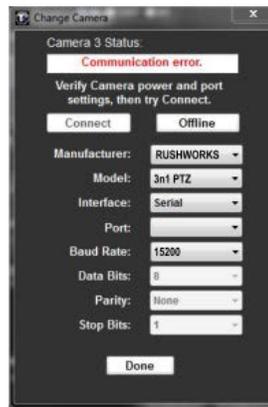
If you select the IP interface, many of the irrelevant entry fields will disappear and you'll then see only the entry fields for the camera's IP addresses - one for the PTZ camera (**Model: 3n1 PTZ**) and the other for the Wide Angle camera (**Model: 3n1 WIDE**).

Click **Connect** … and you should see "**Device is Connected**" in the Status field at the top of the menu. Click done when the camera shows connected.

Configure Tracking

Click the **TRACK SETUP** button and the **Configure 3n1 Tracking** setup window will appear.

Click the **CONFIGURE** button and the **Configure 3n1 Tracking** window will appear.


Configure Tracking

You'll need to set values for each of the tracking parameters in order to optimize tracking behavior. When the setup window opens, the output of the PTZ camera appears in the PTZ Camera window on the left. The output of the Wide Angle Camera is visible in the right window.

The on-screen touchpad arrow buttons are active for panning, tilting and zooming the PTZ camera.

Here are the steps you use to set up tracking:

PTZ Tracking Presets

1) Use the touchpad arrow buttons to frame the shot you'll use for **PTZ tracking**. The best practice is to have the subject stand in the middle of the tracking area while you frame your shot. Then click the **Save Primary Position** button.
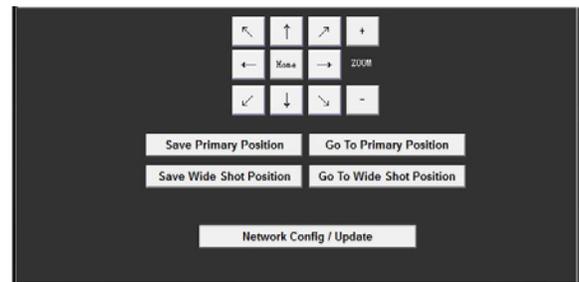
2) Use the touchpad arrow buttons to frame the shot you'll use for a **Wide Shot** that may be used if the tracking algorithm loses the subject. Again, the best practice is to have the subject stand in the middle of the tracking area while you frame your shot. Then click the **Save Wide Shot Position** button.

> **Note**: Click the **GoTo** buttons beside the respective presets to confirm your shot framing. If you want to change the framing, use the touchpad arrow buttons then click **Save**, and it will overwrite the previous framing.

Tracking Area

There are three settings you'll define in this area: **Rectangle**, **Free Form Polygon** and **Masks**. These functions are color-coded, with the text matching the color of its associated shape and function. Click the appropriate radio button to use that function.

When you're defining these elements, and to modify them at any time, use the **Adjust Edges** radio buttons and arrows to modify your bounding selections. First select the edge you want to adjust using the radio buttons, then click the directional arrow buttons to make the adjustments (Top, Bottom, Left, Right). Click the **All** radio button and use the arrows to move the entire selected rectangle in the direction of the arrow.

1) Click the **Rectangle** radio button … then use the mouse to drag a white rectangular border on top of the image from the Wide Angle camera. This defines the maximum area in which the subject will be moving, e.g. a stage or presentation area at the front of a room.

2) Click the **Free Form Polygon** radio button … and use the mouse to draw red connecting lines to define areas where you want to follow your subject. Click once to set the location of the first point, then click the next point to draw the first line segment. Continue click points until you've defined a closed polygon.

3) Click the **Masks** radio button … and use the mouse to drag yellow rectangles over areas of motion, such as TV monitors and other 'busy' areas that may interfere with focusing on the motion of the primary subject. You can create up to 10 individual masks per camera. To create Masks, first check the Mask number checkbox, then drag the bounding mask rectangle over the object(s).
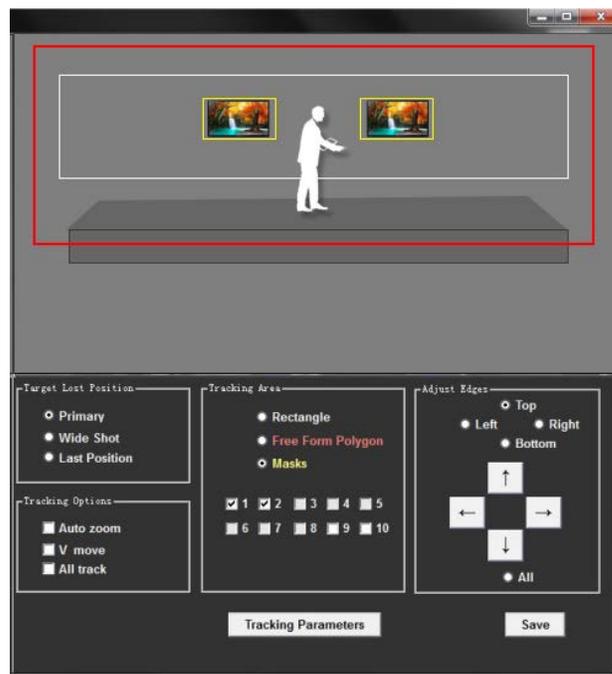
Tracking Parameters

Click the **Tracking Parameters** button to open the entry window. Experiment with these settings to obtain optimal results in your production environment.

Motion Sensitivity: In tracking mode, this is the action range required to trigger tracking when the tracking subject changes from stationary to in-motion. The higher the action sensitivity, the smaller the amount of motion is necessary to trigger auto tracking.

Horizontal Speed: The speed used by the camera for horizontal motion tracking

Vertical Speed: The speed used by the camera for vertical motion tracking

Zoom range: The larger the range, the more amount of camera zoom is used when the subject steps down from a stage or platform

Lost Timeout: The time required (5s by default) for the tracking camera to perform the "subject lost" action when the subject is outside the defined range of action.
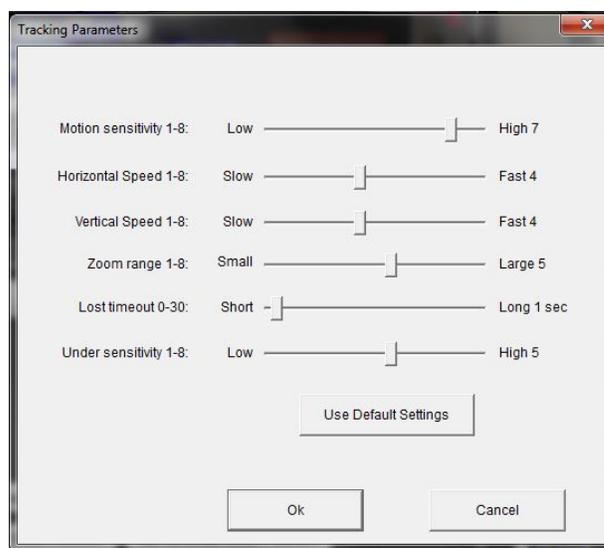
Under Sensitivity: This is used to define the action if the subject steps down from a stage or platform. The lower the sensitivity, the farther the subject's distance from the defined area is used to trigger the down platform action.

Click **Ok** when you're happy with the results of your settings. Click the **X** in the menu bar to close the window.

Target Lost Position – select which PTZ Preset you prefer if the tracked subject moves out of the defined Tracking Area/Boundary. The default is **Wide Shot Preset**.

Network Update

If there is a need to update the camera firmware (RUSHWORKS will advise), you'll need to use the 3n1 configuration tools. Click **Configure -> Network Config/Update** to enter update the interface.

When updating the firmware, be sure to note whether the camera to be upgraded is the PTZ camera or Wide Angle camera, then click the appropriate **Select File** button, followed by the Update button. A progress prompt indicates the status of the file upgrade.
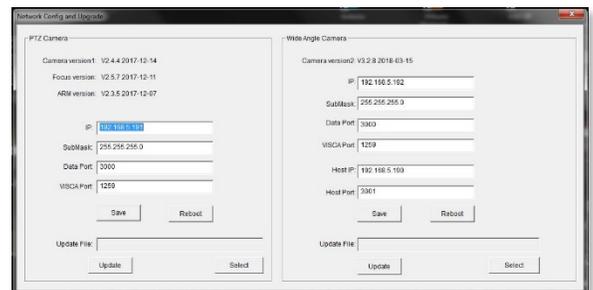
After the firmware upgrade is complete, the camera will perform a self-inspection.

Note: After upgrading, you can restore the factory settings by using the combination of keys **[*] [#] [6]** on the remote control, or by the remote control menu.

Turning Tracking On and Off

Click the **START** button to begin tracking.

Click the **STOP** button to turn tracking off.

Description of the Remote Control

1. Standby key
Long press standby key for 3s, camera enters standby mode, long press this key again for 3s, camera will perform self-inspection again and return to HOME position. When setting #0 as preset, when there is no action within 12s, the holder will return to #0 preset.

2. Select camera
Select address number of camera to be controlled.

3. Number key
Set or call #0-9 preset.

4. *key and #key

5. Focus control key: adjust focus.
[**Auto focus**]: Enter auto focus mode
[**Manual focus**]: shift camera focusing mode to manual;
adjust focus via [Focus +] or [Focus -]

6. Zoom key
[Zoom] +: zoom out lens; [Zoom -]: zoom in lens

7. Set and clear preset key
Set preset: Save a preset, set preset + number key (0-9), that is set preset of corresponding number key
Cancel preset: Cancel a preset, cancel preset + number key (0-9), that is cancel preset of corresponding number key

8. Pan and Tilt control key
UDLR (Up, Down, Left, Right) arrows control the pan and tilt of the PTZ head.
[**HOME**] key: The head returns to center position or enters the next level menu.

9. Backlight compensation control key
Backlight on/off: Turn on or off backlight.

10. Menu key: Enter/exit OSD menu or return to previous level menu.

11. Set infrared remote control address of camera
[*] + [#] + [F1] : # 1 address [*] + [#] + [F2] : # 2 address
[*] + [#] + [F3] : #3 address [*] + [#] + [F4] : #4 address

12、 Combination key functions
[#] + [#] + [#] :   Cancel all presets
[*] + [#] + [6] :   Restore factory settings
[*] + [#] + [9] :   Shift between front and upside down installation
[*] + [#] + manual: Restore default IP, user name, password
[#] + [#] + [0] :   Select 1080p60
[#] + [#] + [1] :   Select 1080p50
[#] + [#] + [2] :   Select 1080i60
[#] + [#] + [3] :   Select 1080i50
[#] + [#] + [4] :   Select 720p60
[#] + [#] + [5] :   Select 720p50
[#] + [#] + [6] :   Select 1080p30
[#] + [#] + [7] :   Select 1080p25

[#] + [#] + [8] :   Select 720p30
[#] + [#] + [9] :   Select 720p25

Using the Remote Control

After a normal startup of the camera, it receives infrared commands. Press down a remote control key, and the key flashes while sending the command to the camera. You can set and recall presets, and control pan, tilt and zoom position with the control.

Description of keys

1. "Key press" means press and release the key on remote control. For example, "press [HOME] key" means press down [HOME] key and release. If long press is needed, it will be indicated.

2. Operation of the combination keys requires pressing the keys in the order specified.
For example, "press [*] + [#] + [F1]" means press [*] first, then [#], and [F1] last.

Select Camera 	Select address number of camera to be controlled.
2）**Control holder** 	**Tilt up**: Press [ ] ; **Tilt down**: Press [ ] **Pan left**: Press [ ] **Pan right**: Press [ ] **Center position**: Press [HOME] Pressing and <u>holding</u> the pan and tilt keys changes from low speed to high speed as long as the button continued to be held down.
3）**SET, CLEAR preset** 	**SET PRESET**: Press this corner of the button then press any number key from 0 to 9, it will reset a preset corresponding to the number key. *Note: with remote control, it can set 10 presets at most.* **CLEAR PRESET**: Press this corner of the button then press any number from 0 to 9, it will cancel the preset corresponding to the number. *Note: Press [#] three times in a row, it will cancel all presets.*
4) **Zoom control** 	**Zoom in**: Press [ZOOM +] **Zoom out**: Press [ZOOM -] Holding down these keys enables continuous zoom in/zoom out
5）**Focus control** 	**FOCUS in**: Press FOCUS + key (only valid in manual focus mode) **FOCUS out**: Press FOCUS - key (only valid in manual focus mode) Holding down these keys enables continuous focus in/focus out **Auto focus**: support **Manual focus**: support ????

6）Set infrared remote control address of camera	[*] + [#] + [F1] : Set up #1 address [*] + [#] + [F2] : Set up #2 address [*] + [#] + [F3] : Set #3 address [*] + [#] + [F4] : Set up #4 address

Menu Functions

Main Menu =============== Language English (Setup) (Camera) (P/T/Z) (Video Format) (Version) (Restore Default) [↑ ↓] Select [←→] Change Value [Menu]Back [Home]OK	**Language**: Select menu language **Settings**: Enter submenu of system parameter settings **Camera parameters:** Enter submenu of camera parameter settings **P/T/Z**: Enter submenu item of holder parameter settings **Version**: Enter submenu of Version **Restore default**: Enter restore default, select "yes" or "no" [↑ ↓] Select: Press [↑ ↓] to select menu item [←→]Change value: Press [←→] to change value [Menu] return: Press menu key to return [Home] OK: Press [Home] key to confirm
System Parameters ============== Protocol Auto Visca Address 1 Visca Address Fix OFF PELCO-P Address 1 PELCO-D Address 1 Baudrate 9600 [↑ ↓]Select [←→]Change Value [Menu]Back	**Protocol**: VISCA/PELCO-P/PELCO-D/Auto **VISCA Address**: 1-7 **VISCA address fix**: ON/OFF **PELCO-P Address**: 1-64 **PELCO-D Address**: 1-64 **Baudrate**: 2400/4800/9600/115200
Camera Parameters ================ (Exposure) (Color) (Image) (Focus) (Noise Reduction) Style Default [↑ ↓]Select [←→]Change Value [Menu]Back [Home]OK	**Exposure**: Enter exposure submenu **Color**: Enter color submenu **Image**: Enter image submenu **Focus**: Enter focus submenu **Noise reduction**: Enter noise reduction submenu **Style**: Default, Standard, Clear, Bright, Gentle
Exposure ============== Mode Auto EV OFF BLC OFF Flicker 50Hz G.Limit 3 DRC 2 [↑ ↓]Select [←→]Change Value [Menu]Back	**Mode**: Auto, Manual, Shutter Priority, Aperture Priority, Brightness Priority **EV**: ON/OFF (only valid in Auto mode) **Exposure Comp**: -7~7 (only valid in Auto mode when "EV" is on) **BLC**: ON/OFF (only valid in Auto mode) **DRC**: 1~8, OFF **Flicker**: Off, 50Hz, 60Hz (valid in auto, shutter priority and brightness priority modes) **G. Limit**: 0~15 (valid in auto, shutter priority and brightness priority modes) **Shutter priority**: 1/25, 1/30, 1/50, 1/60, 1/90, 1/100, 1/120, 1/180, 1/250, 1/350, 1/500, 1/1,000, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000 (valid in manual and shutter priority modes) **Aperture priority**: Off, F11.0, F9.6, F8.0, F6.8, F5.6, F4.8, F4.0, F3.4, F2.8, F2.4, F2.0, F1.8 (valid in manual and aperture priority modes) **Brightness**: 0~23 (only valid in brightness priority mode)

Color =============== WB Mode Auto RG Tuning 0 BG Tuning 0 Saturation 100% Hue 7 AWB Sensitivity Low [↑↓]Select [←→]Change Value [Menu]Back	**WB Mode**: Options: auto, 3000K, 4000K, 5000K, 6500K, manual, one-key white balance. **RG Tuning**: Options: -10~10 (only valid in auto mode) **BG Tuning**: Options: -10~10 (only valid in auto mode) **Red gain**: Options: 0~255 (only valid in manual mode) **Blue gain**: Options: 0~255 (only valid in manual mode) **Saturation**: Options: 60%, 70%, 80%, 90%, 100%, 110%, 120%, 130%, 140%, 150%, 160%, 170%, 180%, 190%, 200% **Hue**: 0~14 **AWB Sensitivity**: high, medium, low (only valid in auto mode)
Image =============== Brightness 7 Contrast 7 Sharpness 4 Flip-H OFF Flip-V OFF B&W-Mode Color Gamma Default DZoom OFF DCI OFF [↑↓]Select [←→]Change Value [Menu]Back	**Brightness**: Options: 0~14 **Contrast**: Options: 0~14 **Sharpness**: Options: 0~15 **Flip-H**: Options: on/off **Flip-V**: Options: on/off **B&W-Mode**: Options: color, black&white **Gamma**: default, 0.45, 0.50, 0.55, 0.63 **Dzoom**: on/off **DCI** (dynamic contrast): OFF, 1~8
Focus =============== Focus Mode Auto AF-Area Center AF-Sensitivity Low [↑↓]Select [←→]Change Value [Menu]Back	**Focus mode**: Auto/Manual **AF-Area**: Up/Center/Low **AF-Sensitivity**: High/Medium/Low
Noise Reduction =============== NR-2D 3 NR-3D 3 Dynamic Hot Pixel OFF [↑↓]Select [←→]Change Value [Menu]Back	**NR-2D**: Auto, OFF, 1~7 **NR-3D**: OFF, 1~8 **Dynamic Hot Pixel**: OFF, 1~5
PTZ =============== Speed by zoom ON Zoom speed 8 Image Freezing OFF Acc Curve Slow [↑↓]Select [←→]Change Value[Menu]Back	**Speed by zoom**: It only works on remote control, on, off; when camera zooms in, remote control will make holder rotate at lower speed. **Zoom speed**: Set speed for remote control camera zoom, 1~8 **Image Freezing**: Options: On/off **Acc Curve**: Options: Quick/slow

Video Format ============== 1080P60 1080P50 1080I60 1080I50 1080P30 1080P25 720P60 720P50 720P30 720P25 1080P59.94 1080I59.94 1080P29.97 720P59.94 720P29.97 [↑ ↓]Select [Menu]Back [Home]OK	**Note**: only when rotation dial-up is at F will ST model menu show this item. **S version**: 1080p60 downward compatibility **M version**: 1080p30 downward compatibility Change parameter value in the menu. To save a value when power is turned off, exit menu.
Firmware Version	On the main menu, move the cursor to (Version), press [HOME] key to enter Version page. Version information varies from product model and date of production. Version information contains version number and version upgrade time. **MCU version**: It displays MCU version information. **Camera version**: It displays camera version information. **Focus version**: It displays focus version information.
Restore Default ============== Restore Default? NO [↑ ↓] Select [←→]Change Valu [Menu]Back [Home]OK	**Note**: If remote address used before is not 1, but any one from 2, 3 and 4, after restoring all parameters or system parameters, device address corresponding to the remote control will be reset to 1. At this moment, it is needed to change remote control address to 1, that is, press Camera and select [1], control will function.