Operation Manual
Multi-Function Professional Robotic Controller

KT-RP8810U-J2

Version 201707 1.1

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FOREWORD:

Thank you for choosing KXWELL products.

This manual will guide you through the features, control operations, camera parameter setup, system connection and operations under different circumstances, abnormal operating states and technical parameters of mention controller.

Please read this operation manual before set-up and operate the robotic system.

KXWELL will not responsible for any misuse and miss-operate of KXWLL products.

WARNING!

- This product must be used within the specified instruction and connection in order to avoid damage to the product or any other product connected / attached on it,
- DO NOT open the housing of the product to prevent electric shock, only qualified technicians are allowed to service and repair of the product;
- Use the product within the specification. Prevent over heating, over voltage, over loading and within humidity to ensure maximum lifetime and stable operation.
- This product is not weatherproof product; keep away from rain and damper.
- Before clean the controller panel, ensure that the product is powered off (without power plug in), and use a soft brush, dry soft cloth to wipe the surface. Use a neutral detergent like LCD / computer cleaning liquid to gently wipe the surface for the tough dirt. DO NOT USE harsh or corrosive detergents that may corrode and damage of the controller. Ensure it's completely dry before power up to avoid damage of the product.
Safety Precautions

This section is to guide users to use this product correctly, thus to prevent danger or property damage. Please read this manual carefully before using the product and keep it properly for future reference.

<table>
<thead>
<tr>
<th><strong>WARNING:</strong></th>
<th><strong>CAUTION:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alerts user of a potential hazard which, if not avoided, could result in serious injury or death</td>
<td>Alerts user of a potential hazard which, if not avoided, could result in injury or property damage</td>
</tr>
</tbody>
</table>

**WARNING:**
- In order to prevent the risk of electric shock, DO NOT attempt to open the panel cover since there is no user-serviceable part inside it. For maintenance, please contact qualified maintenance personnel;
- In order to prevent fire and electric shock, this device should be kept away from any environment where any liquid is used, and can be stored only in an environment without the risk of liquid drop or splash; besides, never place any liquid container on the top of the device;
- Applicable national and local regulations in relation to electrical safety must be observed during installation and use of the product;
- Please use a power adapter supporting this product (KT-RP8810U); DC12V/3000mA power supply should be used;
- Disconnect the AC if the product left unused for a long period of time.

**CAUTION:**
- DO NOT install or place the device in a bookcase, closet or other confined space, in order to prevent electric shock or fire as a result of overheating, please ensure good ventilation for the install location.
- Handle with care; drop may cause damage of the product. Do not install the product on vibration surface; keep away from magnetic field interference to avoid damage of the product and shorten the life time of the product.
- Install and use the product within temperature (\(> +45^\circ C\)) to (\(< -10^\circ C\)) and maximum humidity of (85%).
- Avoid direct sunlight on the device while operation or poor ventilation, or near any heat sources such as heater and central heating. (This may cause malfunction or over heat damage and catch fire of the product.)
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1 **Product Features**

- Remote power ON / OFF of robotic head and camera
- Single button operation for camera / robotic head selection.
- Single button operation to recall preset memory positions.
- Support control maximum up to 10 robotic head and cameras.
- Each Robotic Head supports 20 preset positions memory.
- Variable speed control of robotic head and lens control; iris and focus mode switching*1
- Provide 10 level sensitive speed controls for pan/tilt head and lens, to suit different user operation habits.
- Automatic detect and recognize of camera model when connected, while selecting different camera for operation*1
- Support and control KXWELL video selector or provide GPI to trigger 3rd party router /switcher control panel to preview the camera video while operation.
- Support KXWELL and Third Party protocols.
- Support RS422 and TCP/IP control interface simultaneously.
- Provide 10 GPI & 10 GPO for tally and system interface.
- Support multiple lock modes to prevent miss-operation.
- High-brightness LCD screen display and multi-color light button to indicator the status of the operation.
- Maximum control distance: 1.2km*2

Note:

*1 this function dependent the modal of robotic head and camera select.

*2 the maximum control distance is 1.2km for RS422 control interface and 100m for TCP/IP control interface.
2 Instructions for Controller Installation and Use

Please following below procedure before using the device:

- Read manual carefully and practice to get familiar with the functional and operations of the controller;
- Carry out the wiring connection according to the system connection diagram
- Power on system devices at each level; Controller is the last device to power ON.
- Turn to “ON” position;
- Configure the controller interface mode and communication protocol for each robotic installed.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>◆ Check the correct power supply for each professional device.</td>
</tr>
<tr>
<td>◆ Check the connection cables were plug into correct port.</td>
</tr>
<tr>
<td>◆ Check the matching communication mode with the robotic head.</td>
</tr>
<tr>
<td>◆ Check the system control protocol was selected correctly.</td>
</tr>
</tbody>
</table>
2.1 POWER ON

Prior to formal operation of the controller, please perform the following operations first:

- Connect the AC 110-240 V to the AC adaptor provided in the box, it will output the 12Vdc to connect to of the controller.

- Switch on the front panel to the “ON” position.

After the above two steps, the controller will enter the power-up operating state; Controller is the last devises to power ON.

At this moment, the indicator lights of [1] in the functional zone of camera selection buttons, [FAR], [NEAR], [TELE] and [WIDE] in the functional zone of zoom and focus buttons and [1] in the functional zone of preset position buttons remain on.

CAUTION

◆ To ensure that the controller was supplied with proper voltage; user are advise to use the standard power adapter supplied by KXWELL.
2.2 Pan/tilt Head and Camera Interconnection

Cable connection:

- Connect to the correct interface “RS422/ IP” for both control panel and robotic head as below:

  ![RS422 port](image)
  ![TCP/IP port](image)

Connect to RS 422 port on the controller if the link mode is RS422 and to TCP/IP port if the TCP/IP interface is use. Can configure mix “RS422/ IP” control interface for each robotic camera in the same controller.

- Select the corresponding camera, and configure the controller link mode referring to the method described on Page - 34 -.

- Switch back to the corresponding camera, and observe the LCD display “NOTE” displayed on the screen. Shown “NORMAL-422” If the RS422 link mode is used and shown “NORMAL-TCP” if the TCP/IP link mode is used.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>◆ Use a straight cable for RJ45 (network) cable.</td>
</tr>
<tr>
<td>◆ The controller is the last devices to power on and runs normally.</td>
</tr>
<tr>
<td>◆ The robotic head has been properly configured and powered on.</td>
</tr>
<tr>
<td>◆ The camera has been properly connected according to robotic head instructions and powered on.</td>
</tr>
<tr>
<td>◆ The controller has been wired &amp; connected with the robotic head.</td>
</tr>
<tr>
<td>◆ The controller and robotic head use the same communication mode.</td>
</tr>
<tr>
<td>◆ The controller and robotic head use the same communication protocol.</td>
</tr>
</tbody>
</table>
3 Instructions for System Connection

3.1 RS422 Link Mode
Network Connection

KT-PD40 -> KT-PS500
KT-PD40 -> KT-PS500
KT-PD40 -> KT-PS500

Network Hub / Switcher

TCP/IP

Router

TCP/IP

KT-RP8810U
Kxwell Control Panel

TCP/IP

KT-RP8810U
Kxwell Control Panel

Main Control Room
4 Description of Controller Functions

### Functions of Controller Panel

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power ON / OFF switch</td>
</tr>
<tr>
<td>2</td>
<td>Robotic Head / Camera selection buttons</td>
</tr>
<tr>
<td>3</td>
<td>LCD Display and knobs F1 and F2</td>
</tr>
<tr>
<td>4</td>
<td>Parameter setup buttons</td>
</tr>
<tr>
<td>5</td>
<td>Iris control</td>
</tr>
<tr>
<td>6</td>
<td>Robotic joystick control</td>
</tr>
<tr>
<td>7</td>
<td>Preset &amp; Pan / Tilt limit setup buttons</td>
</tr>
<tr>
<td>8</td>
<td>Zoom and Focus buttons</td>
</tr>
</tbody>
</table>
4.1 OPERATE Switch

It is used to turn the controller panel ON / OFF.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ When this switch is turn to OFF position, the controller will be on standby mode. Camera power ON and OFF can be achieved if the camera is draw DC power from pan/tilt head. Supply power to <strong>KXWELL</strong> robotic head, will not directly supply the DC to the camera until power ON the controller or select the particular robotic button on the controller is the controller was ON.</td>
</tr>
</tbody>
</table>

4.2 Camera Selection Buttons

This ZONE for pan/tilt head and camera selection.

Button [1] to [10] show the maximum number of selection robotic head and camera to be control.

The [LOCK] button to change the control panel keyboard condition at LOCK or ACTIVE mode.

[AUTO ON AIR] button to enable to controller to trigger the MASTER video switcher for ONAIR.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ The [AUTO ON AIR] button is selectable after GPI function is enabled. To enable GPI function, refer to “Controller Parameter Setup Menu” on Page - 18 -.</td>
</tr>
</tbody>
</table>
4.3 Display Screen and Knobs F1 and F2

The LCD display screen is used to display operation info and status; knobs and are used to adjust the parameters selected and set-up of the Camera, Robotic Head, Control Panel. Knob F1 & F2 are use to adjust the speed control of Joystick including the Zoom and Focus Button operation speed.

Knobs SPD1 (1-10) to adjust the control speed of Focus Button [FAR], [NEAR] and Zoom Button [TELE] and [WIDE]; Knobs SPD2 (1-10) to adjust the controls maximum speed of joystick operation.

In the LED CAM menu, knob is use to select by moving the pointer to different menu; knob use to change the parameter of the selected CAM menu. Press knob to enter the submenu or apply the current menu item for certain setup menu.

4.4 Parameter Setup Buttons

The parameter setup buttons use to set camera, controller and robotic head parameters.

Trigger the PAGE button with 3 type of light:

F1, the indicator light of [PAGE] button is off;
F2, the indicator light of [PAGE] button is YELLOW;
F3, the indicator light of [PAGE] button is RED.
The functions of buttons in PARAMETER SETUP zone are different by using KXWELL or 3rd Party protocols, operating modes. Table 1, 2 and 3 define the functions of the buttons in F1, F2 and F3 “PAGE” for the KXWELL protocol. Table 4 and 5 define the functions of buttons in F1 and F2 “PAGE” for the VISCA protocol.

CAUTION
◆ When using KXWELL protocol, the [PAGE] button can be used to switch among the 3 Pages (F1, F2, F3); but when using VISCA protocol, the [PAGE] button can only be used between F1 and F2 pages.

Table 1. Functions of parameter setup buttons for the KXWELL protocol in F1 PAGE

<table>
<thead>
<tr>
<th>Function of button</th>
<th>Description of function</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF/EXT</td>
<td>Switch the focus mode of camera lens (camera dependent)</td>
</tr>
<tr>
<td>REC/ATW</td>
<td>Start or stop video recording for handheld camera (camera dependent)</td>
</tr>
<tr>
<td></td>
<td>Enable the auto white balance mode of multi-purpose 3CCD box camera</td>
</tr>
<tr>
<td>TRC.A/M</td>
<td>Switch the tracking mode after the supporting device is connected (Software application needed)</td>
</tr>
<tr>
<td>TAKE</td>
<td>Turn on or off the tally light in RS422 link mode; Overwrite control of camera or robotic head in TCP/IP mode.</td>
</tr>
<tr>
<td>RET</td>
<td>WB1</td>
</tr>
<tr>
<td>U3</td>
<td>WB2</td>
</tr>
<tr>
<td>OSD</td>
<td>MEMO</td>
</tr>
</tbody>
</table>
Table 2. Functions of parameter setup buttons for the KXWELL protocol in F2 PAGE

<table>
<thead>
<tr>
<th>Function of button</th>
<th>Description of function</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD</td>
<td>F2 PAGE, the indicator light of this button remains on and builds in NO function.</td>
</tr>
<tr>
<td>CAM.</td>
<td>Launch the Quick Camera Parameter Setup (camera dependent) on LCD</td>
</tr>
<tr>
<td>P.T.</td>
<td>Launch the Pan/Tilt Head Parameter Setup menu on LCD</td>
</tr>
<tr>
<td>CON.</td>
<td>Launch the Controller Parameter Setup menu on LCD</td>
</tr>
<tr>
<td>LENS EXT</td>
<td>Execute the 2x extender function of servo extender digital lenses</td>
</tr>
<tr>
<td>U1/POW</td>
<td>User-defined function button 1; Turn ON or OFF the DC of the particular camera (Press and Hold)</td>
</tr>
<tr>
<td>U2/WIPE</td>
<td>User-defined function button 2; Turn ON or OFF the wiper of outdoor pan/tilt head</td>
</tr>
</tbody>
</table>

Table 3. Functions of parameter setup buttons for the KXWELL protocol in F3 PAGE

<table>
<thead>
<tr>
<th>Function of button</th>
<th>Description of function</th>
</tr>
</thead>
<tbody>
<tr>
<td>MENU</td>
<td>Launch the camera main menu (camera dependent) Supper impose to the video.</td>
</tr>
<tr>
<td>ENTER</td>
<td>Execute on the Selected camera menu.</td>
</tr>
<tr>
<td>MENU2</td>
<td>Open the additional menu of the camera (camera dependent)</td>
</tr>
<tr>
<td>↑</td>
<td>Move pointer up in the camera menu</td>
</tr>
<tr>
<td>↓</td>
<td>Move pointer down in the camera menu</td>
</tr>
<tr>
<td>←</td>
<td>Move pointer left in the camera menu</td>
</tr>
<tr>
<td>→</td>
<td>Move pointer right in the camera menu</td>
</tr>
</tbody>
</table>

Table 4. Functions of parameter setup buttons for the VISCA protocol in F1 PAGE

<table>
<thead>
<tr>
<th>Function of button</th>
<th>Description of function</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF/EXT</td>
<td>Switch the focus mode of camera lens (camera dependent)</td>
</tr>
<tr>
<td>REC/ATW</td>
<td>Start or stop recording for handheld camera, (camera dependent)</td>
</tr>
<tr>
<td>TRC.A/M</td>
<td>Switch the tracking mode after the supporting device is connected</td>
</tr>
<tr>
<td>RET</td>
<td>WB1</td>
</tr>
</tbody>
</table>
### Table 5. Functions of parameter setup buttons for the VISCA protocol in F2 PAGE

<table>
<thead>
<tr>
<th>Function of button</th>
<th>Description of function</th>
</tr>
</thead>
<tbody>
<tr>
<td>CON.</td>
<td>Open the Controller Parameter Setup menu</td>
</tr>
</tbody>
</table>

#### 4.5 Iris Control Zone

Press the [IRIS] button to switch the iris to AUTO, MANNUAL and LOCK mode. (Camera modal dependent)

In manual iris mode, rotate [ ] to adjust iris brightness.

#### 4.6 4D Joystick Control Zone

Lift the joystick up, down, left and right to control the robotic for horizontal and vertical movements of robotic head; the dial at the upper part of Joystick use to controls ZOOM or FOCUS of the lens.

The inclination of joystick will affects the speed movement of the robotic head; the more the inclination is, the higher the speed will be, and vice versa.

The reference offset position of the dial at the upper part of the joystick affects the zoom or focus speed of the lens. The bigger the reference offset position, the higher the zoom or focus speed will be.
The button and the button on the top of joystick are use to switch the dial function at the upper part of joystick for ZOOM or FOCUS operation. The indicator light of turns YELLOW if the dial on the joystick as ZOOM operation. “DIAL” clockwise to realize ZOOM IN control, and anti-clockwise for ZOOM OUT control. When as focus operation, the indicator light turns RED. “DIAL“ clockwise to realize Focus FAR control, and anti-clockwise to realize Focus NEAR control.

**NOTE**

- The button at the top of joystick has the same function as the button.

**CAUTION**

- The status indicated show on the controller and camera may be different. For such case, the status indicate in camera shall prevail.
4.7 Preset Position / Limit Setup Buttons

The PRESET / LIMIT buttons use to store or call the preset positions of pan/tilt head; and set the limit of PAN & TILT head.

- Press the [MEMO] button to activate preset memory mode. Follow by pressing any of the blinking buttons to memory into the particular location.
- Press and Hold [MEMO] button for 10 seconds to enter Pan and Tilt movement limit set-up and the LEFT, RIGHT, UP, DOWN button will blink. Select the blink button and observe the LCD "Limit ON" or "Limit OFF". Redo the same step to fulfill the limit set for PAN left & right / TILT up & down.

**CAUTION**

◆ User must set the Pan and Tilt movement limit for all robotic head. This is to prevent the robotic head or camera hit on object during operation.

◆ If user did not do the pan and tilt movement limit it may cause damage to the robotic head or camera during operation.

4.8 Zoom and Focus Buttons

FOCUS is used to control lens focus; ZOOM is used to control lens zoom.

Press the [NEAR] button to focus the camera lens on objects nearby; press the [FAR] button to focus the camera lens on objects far away;

Press the [TELE] button for ZOOM in operation; press the [WIDE] button for ZOOM OUT operation.
4.9 Pan/Tilt Head Parameter Setup Menu

To setup the Pan/Tilt Head Parameter:

Press the [PAGE] button and light turns yellow, press the [P.T.] button to enter Pan Tilt setup; the LCD will display the PAN TILT head menu. You can rotate knob  to move arrow up & down, and rotate knob  to change the setting. Table 6 shows detailed and descriptions of each item in the pan/tilt head setup menu.

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL POW</td>
<td>ON!; OFF!</td>
<td>Turn ON or PFF all pan/tilt heads</td>
</tr>
<tr>
<td>PRE SPD</td>
<td>1~1000</td>
<td>Maximum movement speed when recall preset position.</td>
</tr>
<tr>
<td>PP.DIR</td>
<td>NORMAL; REVERSE</td>
<td>Horizontal “PAN” direction of pan/tilt head.</td>
</tr>
<tr>
<td>PT.DIR</td>
<td>NORMAL; REVERSE</td>
<td>Vertical “TILT” direction of pan/tilt head.</td>
</tr>
<tr>
<td>LEN.PRE</td>
<td>N; Y</td>
<td>Enable to have lens preset memory simulation for handheld camera.</td>
</tr>
<tr>
<td>ACCELERATE</td>
<td>1%~100%</td>
<td>Damping effect of pan/tilt head. 1= delay start/stop. 100= immediate start /stop.</td>
</tr>
<tr>
<td>Z/P DLINK</td>
<td>ENABLE; DISABLE</td>
<td>Link pan/tilt head speed with lens zoom position. P/T auto slowing down when zooming in.</td>
</tr>
</tbody>
</table>
4.10 Camera Parameter Setup Menu

The Camera Parameter Setup menu allows setup of camera parameters.

Press the [PAGE] button and light turns yellow, press the [CAM.] button to enter camera parameter setup; the screen will display the Camera Parameter Setup menu according to the connected camera type. You can rotate knob to move arrow up & down, and rotate knob to change the setting. Table 7 shows detailed and descriptions of each item in the camera parameters setup menu.

CAUTION
◆ The camera parameter setup function was camera dependent, different cameras might have different parameter configurations. The specific items in the Camera Parameter Setup menu are subject to actual camera in use.

| Table 7 Description of configurations of common camera parameters |
| --- | --- | --- |
| **Menu item** | **Options** | **Description** |
| **WB MODE** | AUTO; MEMO; 3200; 5600; 6300; 8000 | Set the white balance mode of camera |
| **SHUTTER** | OFF; 1/100; 1/250; 1/500; 1/1000; 1/2000 | Adjust the camera shutter |

SAVE YES!; NO! Save parameters to current selected pan/tilt head
<table>
<thead>
<tr>
<th>ND</th>
<th>CLR; ND1; ND2; ND3</th>
<th>Set the camera ND filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAIN</td>
<td>MANU; AUTO</td>
<td>Set the gain mode</td>
</tr>
<tr>
<td>MODE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAIN SET</td>
<td>01dB~40dB</td>
<td>Adjust the gain value (Changeable when the gain mode is in MANU)</td>
</tr>
<tr>
<td>AGC MAX</td>
<td>OFF; 6dB; 12dB; 18dB; 24dB</td>
<td>Adjust the gain limit (Changeable when the gain mode is in AUTO)</td>
</tr>
<tr>
<td>R.GAIN</td>
<td>-127~127</td>
<td>Adjust red gain</td>
</tr>
<tr>
<td>B.GAIN</td>
<td>-127~127</td>
<td>Adjust blue gain</td>
</tr>
<tr>
<td>M.BLACK</td>
<td>-127~127</td>
<td>Adjust the master black level</td>
</tr>
<tr>
<td>AWB</td>
<td>Executable</td>
<td>Execute auto white balance. Select and press F2 knob.</td>
</tr>
<tr>
<td>ABB</td>
<td>Executable</td>
<td>Execute auto black balance. Select and press F2 knob.</td>
</tr>
<tr>
<td>VD/BAR</td>
<td>VD; BAR</td>
<td>Switch to video or color bar.</td>
</tr>
<tr>
<td>DTL</td>
<td>-127~127</td>
<td>Adjust the detail level of camera</td>
</tr>
<tr>
<td>FILE</td>
<td>PRESET; 1; 2; 3; 4</td>
<td>Select from camera profile.</td>
</tr>
<tr>
<td>SAVE</td>
<td>PRESET; 1!; 2!; 3!; 4!</td>
<td>Save to camera profile.</td>
</tr>
</tbody>
</table>
### 4.11 Controller Parameter Setup Menu

The Controller Parameter Setup menu allows setup of control parameter including direction, link mode and communication protocol.

Press the [PAGE] button and light turns yellow, press the [CAM.] button to enter camera parameter setup; the screen will display the Camera Parameter Setup menu according to the connected camera type. You can rotate knob → to move arrow up & down, and rotate knob → to change the setting. Table 8 shows detailed and descriptions of each item in the controller setup menu.

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.DIR</td>
<td>NORMAL; REVERSE</td>
<td>Set the horizontal “PAN” control direction for joystick operation</td>
</tr>
<tr>
<td>T.DIR</td>
<td>NORMAL; REVERSE</td>
<td>Set the vertical “TILT” control direction for joystick operation</td>
</tr>
<tr>
<td>Z.DIR</td>
<td>NORMAL; REVERSE</td>
<td>Set the “ZOOM” control direction for joystick operation</td>
</tr>
<tr>
<td>F.DIR</td>
<td>NORMAL; REVERSE</td>
<td>Set the “FOCUS” control direction for joystick operation</td>
</tr>
<tr>
<td>I.DIR</td>
<td>NORMAL; REVERSE</td>
<td>Set the “IRIS” adjustment direction with iris in manual mode.</td>
</tr>
<tr>
<td>LINK MODE</td>
<td>TCP; RS422</td>
<td>Set the link mode for system control</td>
</tr>
<tr>
<td>PROTOCOL</td>
<td>KXWELL; VISCA</td>
<td>Set the communication protocol for to controller</td>
</tr>
<tr>
<td>GPI SET</td>
<td>ENABLE; DISABLE</td>
<td>Set the GPI</td>
</tr>
</tbody>
</table>
SYS.INFO  !  View device info
SAVE  YES!; NO!  Save current settings of controller

**CAUTION**

◆ Changes of [P.DIR], [T.DIR], [Z.DIR], [F.DIR] and [I.DIR] will take effect immediately, while changes of [LINK MODE] and [PROTOCOL] will take effect only after [SAVE] was executed.
5 Controller User Guide

5.1 How to Adjust the Iris

When the light of [IRIS] button is OFF “no light”, the camera in AUTO iris mode.
Press the [IRIS] button and show yellow light, the camera in MANUAL iris mode.
Press the [IRIS] button and show blink light, the camera iris is LOCK.

Auto:
The camera will automatically adjust the iris depending on the lighting condition.

Manual:
Rotate knob to manually adjust the iris level. Turn clockwise to increase and counter-clockwise to decrease the iris.

Lock:
When Iris button show blinking light. The iris is in LOCK mode.

CAUTION
◆ The status indicated show on the controller and camera may be different. For such case, the status indicate in camera shall prevail.

5.2 How to Switch the Camera Focus Mode

[PAGE] button at F1, [PAGE] button indicator light OFF.
Press [AF|EXT] button in the parameter setup zone. If the indicator light is off, the handheld camera is in AUTO focus mode; if the indicator light is yellow, the camera is in MANUAL
focus mode. This function was Modal Dependent. Press the button to trigger focus to AUTO/MANNUAL mode.

5.3 How to Remotely Control Camera power ON/OFF

**Power OFF the selected robotic head and camera individually.**

Select F2 [PAGE] button to light up yellow light.

If the indicator light of [U1/POW] is red, it show that the camera is ON. Press and Hold [U1/POW] button for 2 second until the indicator light of [U1/POW] goes off. This steps to power off the selected camera.

**Power OFF all the pan tilt head and cameras in one time.**

Select F2 [PAGE] to light up yellow light.

Select P.T button to menu setting. Using knob F1 to move the pointer to [All.POW], and using knob F2 to change OFF and press down the knob F2 to power off all robotic head and camera in one time.

**NOTE**

◆ When Controller switch on, it will auto switch on all the Robotic Head and camera one by one and take about 10 second to detect camera and lens installed.

**CAUTION**

◆ When the KXWELL protocol is used for communication, after executing the camera shutdown command, the camera will be disconnected from the controller and lose control. User can select this camera again to restore control over the camera.

5.4 How to Display Camera OSD Characters

Press [OSD|MEMO] button in the parameter setup zone to turn ON and OFF of the camera OSD. When the indicator light of [OSD|MEMO]
turns yellow, the OSD is on; when the indicator light of [OSD|MEMO] goes off, the OSD is off. OSD = ON SCREEN DISPLAY.

NOTE
◆ Do not on the OSD if taking video direct from the camera to ONAIR.

5.5 How to Adjust Camera Image Parameters

The controller integrated of camera image parameters control menu such as white balance, shutter, filter and gain.

CAUTION
◆ Ensure the camera used is included in the list of cameras supported by the controller.
◆ Different cameras have different configurable parameters.

5.5.1 Setting White Balance Mode

Set the white balance mode in the Camera Parameter Setup menu

→WB MODE: AUTO

1. Select F2 [PAGE] button to light up in yellow.

2. Select the [CAM.] button and the LCD display will show the Camera Parameter Setup menu.

3. Rotate knob \( \bigcirc \) to move the pointer to select “WB MODE”; rotate knob \( \bigcirc \) to change the white balance mode.

Operation steps for setting white balance using the keyboard:

- [PAGE] button at F1, [PAGE] button indicator light is OFF.
- Select [REC|ATW] button to switch the auto white balance mode of camera.
- Select [RET|WB1] button to switch the white balance/ 3200K color temperature mode of camera.
- Select [U3|WB2] button to switch the white balance/ 5600K color temperature mode of camera.
- Select [OSD|MEMO] button to switch the white balance/ MEMO mode of camera.

CAUTION
◆ Different modal of cameras support different setting of white balance mode with buttons.

5.5.2 Change And Select ND Filters

Operation steps:

1. Select F2 [PAGE] button to light up in yellow.
2. Select the [CAM.] button and the LCD display will show the Camera Parameter Setup menu.
3. Rotate knob to move the pointer to select “ND Filter”; rotate knob to change the ND Filter.

5.5.3 Adjusting Camera Shutter

Operation steps:

1. Select F2 [PAGE] button to light up in yellow.
2. Select the [CAM.] button and the LCD display will show the Camera
Parameter Setup menu.

3. Rotate knob \( \text{F1} \) to move the pointer to select “shutter speed”; rotate knob \( \text{F2} \) to change the shutter speed.

5.5.4 Setting Gain

Set the gain mode

\[ \text{GAIN MODE: MANU} \]

1. Select F2 [PAGE] button to light up in yellow.
2. Select the [CAM.] button and the LCD display will show the Camera Parameter Setup menu.
3. Rotate knob \( \text{F1} \) to move the pointer to select “Gain Mode”; rotate knob \( \text{F2} \) to change the gain mode to Auto or Manual Gain.

Set the maximum value of auto gain:

\[ \text{AGC MAX: OFF} \]

1. Select F2 [PAGE] button to light up in yellow.
2. Select the [CAM.] button and the LCD display will show the Camera Parameter Setup menu.
3. Rotate knob \( \text{F1} \) to move the pointer to select “AGC MAX”; rotate knob \( \text{F2} \) to change the maximum auto gain value.
Set manual gain

→GAIN SET: 01dB

1. Select F2 [PAGE] button to light up in yellow.
2. Select the [CAM.] button and the LCD display will show the Camera Parameter Setup menu.
3. Rotate knob to move the pointer to select “Gain Set”; rotate knob to change the Gain Value.

5.5.5 Switching between Video Output or Color Bar Output

Operation steps:

→VD/BAR: VD

1. Select F2 [PAGE] button to light up in yellow.
2. Select the [CAM.] button and the LCD display will show the Camera Parameter Setup menu.
   Rotate knob to move the pointer to select “VD/BAR”; rotate knob to change the camera video output to CAMERA video or Color Bar.

5.5.6 Setting Red/Blue Gain

Operation steps:

→R. GAIN: 0
   B. GAIN: 0

1. Select F2 [PAGE] button to light up in yellow.
2. Select the [CAM.] button and the LCD display will show the Camera
Parameter Setup menu.

3. Rotate knob \( \rightarrow \) to move the pointer to select “R.GAIN”; rotate knob \( \rightarrow \) to change the RED gain.

4. Rotate knob \( \rightarrow \) to move the pointer to select “B.GAIN”; rotate knob \( \rightarrow \) to change the BLUE gain.

5.5.7 Setting Master Black Level

Operation steps:

\[ \rightarrow \text{M. BLACK: } 0 \]

1. Select F2 [PAGE] button to light up in yellow.

2. Select the [CAM.] button and the LCD display will show the Camera Parameter Setup menu.

3. Rotate knob \( \rightarrow \) to move the pointer to select “M.BLACK”; rotate knob \( \rightarrow \) to adjust the Master Black level.

5.5.8 Adjusting Detail Level of Camera

Operation steps:

\[ \rightarrow \text{DTL: } 0 \]

1. Select F2 [PAGE] button to light up in yellow.

2. Select the [CAM.] button and the LCD display will show the Camera Parameter Setup menu.
3. Rotate knob to move the pointer to select “DTL”; rotate knob to adjust the detail level of camera.

5.6 How to Start and Stop Camera Recording

Operation steps:

1. [PAGE] button at F1, [PAGE] button indicator light is OFF.
2. Press the [REC|ATW] button to turn on its yellow light; the camera will start recording. Press the [REC|ATW] button to turn off the yellow light; the camera will stop recording.

CAUTION

◆ The recording function is effective for handheld cameras, not for multi-purpose POV/BOX cameras.

5.7 How to Control the Camera Menu

Operation steps:

2. Press the [MENU] button to open the camera menu; takes the SUPER /MON out of the camera to view the camera menu via the video monitor.
3. Use [↑][↓][←][→] buttons to move the pointer shown on the camera menu.
4. Press [ENTER] button to execute the selected menu to change the setting or enter to the submenu of the camera. Press [↑][↓] to change the value.

5. Some cameras have [MENU2]; when the [MENU2] button is pressed, the monitor will display a special camera menu.

**NOTE**

◆ Camera Menu control is camera dependent
◆ Different Camera Menu may operate differently.
◆ User is required to plug in to camera Super-out in order to see the camera menu display.

### 5.8 How to Store and Recall Preset Positions

![PRESET/LIMIT](image)

Save and recall P/ T/ Z/ Iris position in preset memory.

1. Move the robotic head and lens to the desire position.

2. Press MEMO button and 1-10 buttons start to blink. Select the location you would like to store.


5.9 How to set Pan/Tilt Limit Position

1. Select and hold MEMO button for 10 seconds, until the 4 buttons [UP, DOWN, LEFT, RIGHT] start to blink. Keep hold on MEMO button.
2. Select the button for the direction you wish to set the limit and observe the LCD show “Limit ON” or “Limit OFF” when you press the blinking button.
3. Repeat steps 1 & 2 for all the direction of limits set.
4. Limit ON, means that you have successfully set the Pan / Tilt limit for that direction.
5. Limit OFF, show that you have remove the pan /tilt limit for that direction.

CAUTION

- PAN/TILT limit need to be set to prevent the robotic head or camera-installed hit on wall or mounting plate. It will damage the robotic servo or camera for long run.

NOTE

- KT-RP8810 is able to save up till 20 preset memory per robotic head.
- KT-RP8810 preset memory will overwrite the preset memory if the preset is being saved in the same ID location.
- KXWELL Preset memory will saved in Robotic Head.
5.10 How to Switch Tracking Mode

[TRC.A/M] button use for enable and disable 3rd party manufacturer auto tracking devise to control KXWELL robotic head in one system.

Operation steps:

- [PAGE] button at F1, [PAGE] button indicator light is OFF.
- [TRC.A/M] button the indicator light is OFF; allow 3rd party manufacturer auto tracking devise to control KXWELL robotic head. KXWELL controller unable to control robotic head.
- Activate [TRC.A/M] button and yellow light turn ON; this will OFF the auto tracking mode and the controller will take over to control the pan/tilt heads and cameras.

NOTE

◆ This Function will work if an Auto Tracing Device is connected to the control panel. Kindly contact KXWELL for more information.

5.11 How to Control the Wiper of Outdoor Pan/Tilt Head

Operation steps:

- Select F2 [PAGE] button to light up in yellow.
- Select the [U2/WIPE] button to activates the Wiper function
- Press the [U2/WIPE] button again to turn off the wiper.
5.12 How to Configure the Movement Direction of Pan/Tilt Head

Operation steps for setting reverse movement direction of pan/tilt head:

- Press the [PAGE] button and yellow light ON.
- Press the [P.T] button and yellow light ON; the LCD display will show the Pan/Tilt Head Parameter Setup menu.
- Rotate knob \( \text{F1} \) to move the pointer to select “PP.DIR”; rotate knob \( \text{F2} \) to change to NORMAL or REVERSE direction for PAN movement.
- Rotate knob \( \text{F1} \) to move the pointer to select “PT.DIR”; rotate knob \( \text{F2} \) to change to NORMAL or REVERSE direction for TILT movement.
- Rotate knob \( \text{F1} \) to move the pointer to select “SAVE”; rotate knob \( \text{F2} \) to select “YES!”; press \( \text{F1} \) to change “YES!” and show “DONE”, this will apply the movement setting of pan/tilt head.

Operation steps for setting reverse direction of controller:

- Press the [PAGE] button and yellow light ON.
- Press the [CON.] button and yellow light ON; the LCD display will show the Controller Parameter Setup menu.
- Rotate knob \( \text{F1} \) to move the pointer to select “P.DIR”; rotate knob \( \text{F2} \) to change to NORMAL or REVERSE direction for PAN movement.
- Rotate knob \( \text{F1} \) to move the pointer to select “T.DIR”; rotate knob \( \text{F2} \) to change to NORMAL or REVERSE direction for TILT movement.
- Repeat above steps for [P.DIR], [T.DIR], [Z.DIR], [F.DIR] and [I.DIR] setting;
refer to the detailed descriptions of these items in Table 8 in “Page 18”.

- In the Controller Parameter Setup menu, rotate knob \( \text{F1} \) to move the pointer to select “SAVE”; rotate knob \( \text{F2} \) to select “YES!”; press \( \text{F1} \) to change and show “DONE”, this will apply the movement setting of pan/tilt head.

### CAUTION

◆ The controller can set the movement direction of pan/tilt head via the Pan/Tilt Head Parameter Setup menu or via the Controller Parameter Setup menu. If the vertical movement direction of pan/tilt head is set to reverse direction in both the Pan/Tilt Head Parameter Setup menu and the Controller Parameter Setup menu, the actual control direction of pan/tilt head when operating the joystick is normal direction.

#### 5.13 How to Configure the Movement Acceleration of Pan/Tilt Head

**Operation steps:**

- Press the [PAGE] button and yellow light ON.
- Press the [P.T.] button and yellow light ON; the LCD display will show the Pan/Tilt Head Parameter Setup menu.
- Rotate knob \( \text{F1} \) to move the pointer to select “ACCELERATE” (ACC); rotate knob \( \text{F2} \) to adjust acceleration between 1%-100%. The acceleration is the lowest when adjusted to 1% and the highest when adjusted to 100%. Knows as damping effect of pan/tilt head. 1= delay start/stop. 100= immediate start/stop.
5.14 How to Link Pan/Tilt Head Control with Lens Zoom

Automatically slow down the maximum speed of Pan and Tilt while lens in ZOOM IN position if this function is ON.

**Operation steps:**

- Press [PAGE] button and yellow light ON.
- Press [P.T.] button and yellow light ON; the LCD display will show the Pan/Tilt Head Parameter Setup menu.
- Rotate knob to move the pointer to select “Z/P DLINK”; rotate knob to select ON or OFF.
- Rotate knob to move the pointer to select “SAVE”; Rotate knob to select “YES!"; press to change and show “DONE”, this will apply the change.
5.15 How to Configure the Link Mode

Set Controller to RS422 or IP link interface depend on the configuration.

Operation steps:

- Determine the link mode for pan/tilt head by the method described in the Instruction Manual for Pan/Tilt Head. Both controller and robotic head need to have same control interface.
- Press [PAGE] button and yellow light ON.
- Press [CON.] button and yellow light ON; the LCD display will show the Controller Parameter Setup menu.
- Rotate knob to move the pointer to select [LINK MODE]; rotate knob to change to “RS422” or “TCP”, thus to match it with the link mode of pan/tilt head.
- Rotate knob to move the pointer to select [SAVE]; rotate knob to change it to “YES!”; then press to change and show “DONE”; this will apply the link mode changes.

CAUTION

- Able to set different link mode for each robotic and cameras.
- In TCP mode, the network parameters of the controller in to be configure according to the network requirement. Refer to Section 5.18 to setup.
- In case of no communication between controller and robotic head, directly press to enter the Controller Parameter Setup menu, where the link mode can be configured as steps 5.15 to get proper connection.
5.16 How to Lock the Controller

Operation steps for locking the keyboard in the zone of camera selection buttons:

- Indicator light for [LOCK] button is OFF at normal circumstances.
- Press and hold the [LOCK] button for 2s, the indicator light of [LOCK] will turn green. This will locked the camera selection buttons. If the camera button was pressed, the LCD screen will be displayed “LOCK CAM”.

Operation steps for locking the entire keyboard

- When the indicator GREEN light on [LOCK] button turns on, press and hold the [LOCK] button again for 2s and it change to red light. This will fully LOCK the controller keyboard; if any key was pressed, the LCD screen will be displayed “LOCK ALL”.

Operation steps for unlocking the keyboard:

- When the indicator RED light on [LOCK] turns on, press and hold the [LOCK] button for 2s to turn the light OFF; This to unlock to controller for normal operation.

Operation steps for locking the joystick:

- Joystick under normal operation when the indicator light of button is on.
- Press and hold the button + Press the button on the top of the joystick to turn off the indicator light. This operation will lock the joystick.
Operation steps for unlocking the joystick:

- When the indicator light of ✅ is off, the joystick status is locked;
- To enable joystick for operation; press and hold the ✪ button + Press the button at the top of the joystick to turn on the yellow (or red) light ✅ ON.

**CAUTION**

- In case of disconnection of DC power when the keyboard is locked, the keyboard will be automatically reset to the unlocked state.
- The actual use may deviate from the description, subject to the actual product.

### 5.17 How to Configure the Communication Protocol

Operation steps during normal connection:

- Determine the communication protocol of pan/tilt head by the method described in the Instruction Manual for Pan/Tilt Head.
- Press the [PAGE] button and yellow light ON.
- Then press the [CON.] button and yellow light ON; the LCD display will show the Controller Parameter Setup menu.
- Rotate knob ✭ to move the pointer to select [PROTOCOL]; rotate ✭ to select “KXWELL” or “VISCA”, thus to match it with the communication protocol of pan/tilt head.
- Rotate knob ✭ to move the pointer to select [SAVE]; rotate knob ✭ to change it to “YES!”; then press ✭ to change and show “DONE”; this will
apply the communication protocol setting.

CAUTION

◆ Able to set different communication protocol for each robotic.

◆ In case of no communication between controller and robotic head, directly press 

![Controller Parameter Setup](image) to enter the Controller Parameter Setup menu, where the

communication protocol can be configured as steps 5.17 to get proper connection.
5.18 How to Configure Network IP for the Controller

Open the Network Configuration interface:

➢ Press the [PAGE] button and the yellow light ON.
➢ Press the [CON.] button and yellow light ON; the LCD display will show the Controller Parameter Setup menu.
➢ Rotate knob \( \bigcirc \) to move the pointer to select [LINK MODE]; rotate the knob \( \bigcirc \) to change to “TCP”, and press \( \bigcirc \); to enter to NET menu and the LCD screen will display the Network Parameter Setup menu.

Configure the IP address of controller:

➢ In the Network Parameter Setup menu, rotate knob \( \bigcirc \) to move the pointer to select [LOCAL IP], and press \( \bigcirc \) to enter IP address input mode with cursor shown.
➢ Rotate knob \( \bigcirc \) to select different address fields; rotate knob \( \bigcirc \) to change the numerical value of the IP address. After setting, press \( \bigcirc \) to return to the Network Parameter Setup menu.

Configure the subnet mask of controller:

➢ In the Network Parameter Setup menu, rotate knob \( \bigcirc \) to move the pointer to select [SUB-MASK], and press \( \bigcirc \) to enter subnet mask address setup with cursor shown.
➢ Rotate knob \( \bigcirc \) to select different address fields; rotate knob \( \bigcirc \) to
change the numerical of SUB-MASK address field. After setup, press \( \textcircled{F2} \) to return to the Network Parameter Setup menu.

**Configure the default gateway of controller**

- In the Network Parameter Setup menu, rotate knob \( \textcircled{F1} \) to move the pointer to select [GATEWAY], and press \( \textcircled{F2} \) to enter gateway address setup with cursor shown.
- Rotate knob \( \textcircled{F1} \) to select different address fields; rotate knob \( \textcircled{F2} \) to change the numerical of address field. After setting, press \( \textcircled{F2} \) to return to the Network Parameter Setup menu.

**Configure the port of controller:**

- In the Network Parameter Setup menu, rotate knob \( \textcircled{F1} \) to move the pointer to select [LOC.PORT]; rotate knob \( \textcircled{F2} \) to directly change the port number of controller.

**Configure the IP address of pan/tilt head:**

- Determine the IP address of pan/tilt head by the method described in the Instruction Manual for Pan/Tilt Head.
- In the Network Parameter Setup menu, rotate knob \( \textcircled{F1} \) to move the pointer to select [REMOTE IP], and press \( \textcircled{F2} \); to enter the IP address setting state of pan/tilt head, and with cursor shown.
- Rotate knob \( \textcircled{F1} \) to select different address fields; rotate knob \( \textcircled{F2} \) to set the numerical address field. After setting, press \( \textcircled{F2} \) to return to the Network
Parameter Setup menu.

**Configure the port of pan/tilt head:**

- Determine the port number of pan/tilt head by the method described in the Instruction Manual for Pan/Tilt Head.
- In the Network Parameter Setup menu, rotate knob \( \text{P1} \) to move the pointer to select \([\text{REM.PORT}]\); rotate knob \( \text{P2} \) and directly change the port number of pan/tilt head.

**Save configuration:**

- In the Network Parameter Setup menu, rotate knob \( \text{F1} \) to move the pointer to select \([\text{SAVE}]\); rotate knob \( \text{F2} \) to change it to “YES!”; then press \( \text{F2} \); the controller will save the network parameters and restart automatically.

The buttons [1] to [10] are able to use as input key for network setup application. Press [1] will key in digit “1” and [10] to digit “0”. Key in digit will be added from to right to left of the key in space. If the key in value exceeds the maximum value, this value at the space will be reset to the minimum number.

---

**CAUTION**

- All network parameters will be configurable when in TCP/IP link. Therefore, in order to validate the configured network parameters immediately, the link mode of the robotic should be set to TCP/IP and saved prior to configuration.
- Network parameters should be configured by IT network personnel who act as network administrator in the organization.
- Controller is able to set as Network Client and robotic head as Network server for to remotely control capability.
Table 6. Description of configurations in the Controller Network Setup menu

<table>
<thead>
<tr>
<th>Menu item</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL IP</td>
<td>0.0.0.0~255.255.255</td>
<td>Controller IP address</td>
</tr>
<tr>
<td>SUB-MASK</td>
<td>0.0.0.0~255.255.255</td>
<td>Subnet mask of controller</td>
</tr>
<tr>
<td>GATEWAY</td>
<td>0.0.0.0~255.255.255</td>
<td>Gateway address of controller</td>
</tr>
<tr>
<td>REM.PORT</td>
<td>1~65535</td>
<td>Port number of target pan/tilt head</td>
</tr>
<tr>
<td>REMOTE IP</td>
<td>0.0.0.0~255.255.255</td>
<td>IP address of target pan/tilt head</td>
</tr>
<tr>
<td>LOC.PORT</td>
<td>1~65535</td>
<td>Port number of controller</td>
</tr>
<tr>
<td>SAVE</td>
<td>YES!; NO!</td>
<td>Save current network setup of controller</td>
</tr>
</tbody>
</table>
5.19 How to Use the GPI Function

Operation steps for enabling GPI signal:

➢ Press the [PAGE] button to turn yellow light ON.
➢ Then press the [CON.] button and yellow light ON; the LCD display will show the Controller Parameter Setup menu.

➢ Rotate knob \( \text{F1} \) to move the pointer to select [GPI SET]; rotate knob \( \text{F2} \) to set its to [ENABLE].
➢ In the Controller Parameter Setup menu, rotate knob \( \text{F1} \) to move the pointer to select [SAVE]; rotate knob \( \text{F2} \) to set its state to [YES!]; then press \( \text{F1} \) to save the setting.

Open the GPI Signal Mapping menu:

➢ Press the [PAGE] button to turn yellow light ON.
➢ Then press the [CON.] button and yellow light ON; the LCD display will show the Controller Parameter Setup menu.

➢ Rotate knob \( \text{F1} \) to move the pointer to select [GPI SET], and press \( \text{F2} \); the LCD screen will display the GPI Signal Mapping menu.

Configure GPI signal as the master monitoring signal:

➢ In the GPI Signal Mapping menu, rotate knob \( \text{F1} \) to select an option between [GPI1]-[GPI10]; rotate knob \( \text{F2} \) to map it to [PGM1]-[PGM10], which represent the master monitoring signals of No. 1-10 cameras.
5.20 How to Reset to Factory Settings

Operation steps for resetting to factory settings:

- Disconnect the adapter connecting cable from \( \text{POWER} \) to completely cut off power supply to the controller.

- Press and hold \( \text{F1} \), \( \text{F2} \), and \( \text{F3} \) on the controller simultaneously.

- Reconnect the adapter connecting cable to \( \text{POWER} \) to power on the controller.

- If the controller screen displays “FACTORYRESET”, it indicates that the operation of resetting to factory settings has been performed. At this moment, user can release \( \text{F1} \), \( \text{F2} \) and \( \text{F3} \).

---

CAUTION

- GPI is OFF by default.
- Any two GPI signals cannot be simultaneously set as the same master monitoring signal.
- To map [GPI9] to [PGM1] when [PGM1] has been mapped by [GPI2] signal, user can first un-map [GPI2], and then set to map [GPI9] to [PGM1].
5.21 How to View Version Information

**Operation steps:**

- Press the [PAGE] button to turn yellow light ON.
- Then press the [CON.] button and yellow light ON; the LCD display will show the Controller Parameter Setup menu.
- Rotate knob \[\text{F1}\] to move the pointer to select [SYS.INFO], and press \[\text{F1}\]; the LCD display will show the System Version and Info interface.
- Rotate knob \[\text{F1}\] to scroll up and down to display all controller info.

5.22 How to Use Web Services

**Operation steps:**

- Power on system devices at each level.
- Turn \[\text{F1}\] to the “ON” position.
- Wait for completion of power-on polling.
- Using a cross cable, connect the controller TCP/IP port to personal computer.
- Personal computer and the robotic controller IP must set to have same subnet.

For example, if the controller’s IP address is 192.168.0.2, subnet mask 255.255.255.0 and gateway 192.168.0.1, the computer’s IP address can be set to 192.168.0.148, subnet mask to 255.255.255.0 and gateway to 192.168.0.1.
Open the Web browser on the computer; enter the controller’s IP address in the address bar; then press ENTER.
6 Description of Abnormal States

Failed of controller may result by poor wire or configuration issue. If the controller is abnormal, there will be an error message and status of the control system show on LCD display with blinking light indicator for corresponding button on the controller.

6.1 Connection Error State

When there is no connection between controller and robotic head, the controller LCD display will show under “NOTE” is “LINK ERROR”; and the indicator lights of all buttons on the control panel will be off, except the indicator light of the camera selected button will blink quickly in yellow.

Causes of connection error state include the following:

1. Connect to wrong communication port for robotic head and controller.
2. The RJ45 control cable in poor contact.
3. Wrong configuration for communication protocol.
4. The robotic head do not power ON.
6.2 Network IP Cable Disconnection State

When the port on the controller is not connected to the router or other IP network device via RJ45 cable, the controller LCD display will show under "NOTE" is "TCP/IP OFF". This message will be shown only while in TCP/IP link mode configuration.

If shown “TCP/IP OFF” status, check the IP cable connection between devices, and try repeated plug and unplug of the network cable to port for both controller and network hub/switch to ensure the connectivity. If a good network cable has been connected with proper attached to the switch or router, the LCD display will not shown “TCP/IP OFF”.

6.3 Network Off-line State

When the IP port of the controller has been properly connected to the router or other IP network device but no robotic head IP was link to the controller, the controller LCD display will show under "NOTE" is “NO CON.YET”. This message will be shown only while in TCP/IP link mode configuration.

When IP network shown off-line “NO CON.YET” status, check the network parameters configuration of the controller (page 38-41) and IP configuration for robotic head. The network administrator should carry out the network setup and
other relevant configuration. If normal communication has been achieved between the controller and the camera or pan/tilt head, “NORMAL-TCP” will be displayed on the third line of the LCD display.
7 Port Definition

Fig. 1 shows the ports of the controller.

![Port Diagram](image)

**Fig. 1. Ports on the rear panel**

**CAUTION**

- Please use the power adapter supplied with the product.
- The SERVICE port is for maintenance only, and currently not for other use.

7.1 Power Supply Port

![Power Supply Port Diagram](image)

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>+12V</td>
</tr>
<tr>
<td>2, 3</td>
<td>NC</td>
</tr>
</tbody>
</table>
7.2 TCP/IP Control Port

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tx+</td>
</tr>
<tr>
<td>2</td>
<td>Tx-</td>
</tr>
<tr>
<td>3</td>
<td>Rx+</td>
</tr>
<tr>
<td>6</td>
<td>Rx-</td>
</tr>
<tr>
<td>4, 5, 7, 8</td>
<td>NC</td>
</tr>
</tbody>
</table>

7.3 RS422 Control Port

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Tx-</td>
</tr>
<tr>
<td>4</td>
<td>Rx-</td>
</tr>
<tr>
<td>5</td>
<td>Rx+</td>
</tr>
<tr>
<td>6</td>
<td>Tx+</td>
</tr>
<tr>
<td>8</td>
<td>GND</td>
</tr>
<tr>
<td>1, 2, 7</td>
<td>NC</td>
</tr>
</tbody>
</table>
7.4 Video Selector Control Port

The REMOTE2 RS-232 port is used to control KXWELL video selector to trigger and select the camera video for operation preview usage. The selection of the video input will correspond to the camera selection by KXWELL robotic controller.

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>RXD</td>
</tr>
<tr>
<td>3</td>
<td>TXD</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td>1, 4, 6, 7, 8, 9</td>
<td>NC</td>
</tr>
</tbody>
</table>

7.5 Auxiliary Control Port

The REMOTE1 RS-232 port is used to daisy link the KXWELL robotic controller. The RS-232 to RS422 converter with external power supply needs to be used to connect between 2 controllers. Multiple controllers can fulfill in one control system.

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>TXD</td>
</tr>
<tr>
<td>3</td>
<td>RXD</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td>1, 4, 6, 7, 8, 9</td>
<td>NC</td>
</tr>
</tbody>
</table>
7.6 External Control Signal Output Port

GPI OUT 1 to GPI OUT 10 are output GPI interface for controller to interface with 3rd party devices. Example: Outputs the GPI to trigger router / AUX control panel with GPI in to fulfill video switching for operation preview.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GPI OUT 1A</td>
<td>Output signal 1 channel A</td>
</tr>
<tr>
<td>2</td>
<td>GPI OUT 1B</td>
<td>Output signal 1 channel B</td>
</tr>
<tr>
<td>3</td>
<td>GPI OUT 2A</td>
<td>Output signal 2 channel A</td>
</tr>
<tr>
<td>4</td>
<td>GPI OUT 2B</td>
<td>Output signal 2 channel B</td>
</tr>
<tr>
<td>5</td>
<td>GPI OUT 3A</td>
<td>Output signal 3 channel A</td>
</tr>
<tr>
<td>6</td>
<td>GPI OUT 3B</td>
<td>Output signal 3 channel B</td>
</tr>
<tr>
<td>7</td>
<td>GPI OUT 4A</td>
<td>Output signal 4 channel A</td>
</tr>
<tr>
<td>8</td>
<td>GPI OUT 4B</td>
<td>Output signal 4 channel B</td>
</tr>
<tr>
<td>10</td>
<td>GPI OUT 5A</td>
<td>Output signal 5 channel A</td>
</tr>
<tr>
<td>11</td>
<td>GPI OUT 5B</td>
<td>Output signal 5 channel B</td>
</tr>
<tr>
<td>12</td>
<td>GPI OUT 6A</td>
<td>Output signal 6 channel A</td>
</tr>
<tr>
<td>13</td>
<td>GPI OUT 6B</td>
<td>Output signal 6 channel B</td>
</tr>
<tr>
<td>14</td>
<td>GPI OUT 7A</td>
<td>Output signal 7 channel A</td>
</tr>
<tr>
<td>15</td>
<td>GPI OUT 7B</td>
<td>Output signal 7 channel B</td>
</tr>
<tr>
<td>16</td>
<td>GPI OUT 8A</td>
<td>Output signal 8 channel A</td>
</tr>
<tr>
<td>17</td>
<td>GPI OUT 8B</td>
<td>Output signal 8 channel B</td>
</tr>
<tr>
<td>19</td>
<td>GPI OUT 9A</td>
<td>Output signal 9 channel A</td>
</tr>
<tr>
<td>20</td>
<td>GPI OUT 9B</td>
<td>Output signal 9 channel B</td>
</tr>
<tr>
<td>21</td>
<td>GPI OUT 10A</td>
<td>Output signal 10 channel A</td>
</tr>
<tr>
<td>22</td>
<td>GPI OUT 10B</td>
<td>Output signal 10 channel B</td>
</tr>
</tbody>
</table>

Pin 9, 18, 23, 24, 25, 26 are grounded (GND) for protection.
7.7 External Control Signal Input Port

GPI IN 1 to GPI IN 10 are used to connect external control signals to KXWELL controller. For example, the Tally GPI from the video switcher.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GPI IN 1</td>
<td>Input control signal 1</td>
</tr>
<tr>
<td>3</td>
<td>GPI IN 2</td>
<td>Input control signal 2</td>
</tr>
<tr>
<td>5</td>
<td>GPI IN 3</td>
<td>Input control signal 3</td>
</tr>
<tr>
<td>7</td>
<td>GPI IN 4</td>
<td>Input control signal 4</td>
</tr>
<tr>
<td>10</td>
<td>GPI IN 5</td>
<td>Input control signal 5</td>
</tr>
<tr>
<td>12</td>
<td>GPI IN 6</td>
<td>Input control signal 6</td>
</tr>
<tr>
<td>14</td>
<td>GPI IN 7</td>
<td>Input control signal 7</td>
</tr>
<tr>
<td>16</td>
<td>GPI IN 8</td>
<td>Input control signal 8</td>
</tr>
<tr>
<td>19</td>
<td>GPI IN 9</td>
<td>Input control signal 9</td>
</tr>
<tr>
<td>21</td>
<td>GPI IN 10</td>
<td>Input control signal 10</td>
</tr>
<tr>
<td>2, 4, 6, 8, 9, 11, 13, 15, 17, 18, 20, 22, 23, 24, 25, 26</td>
<td>GND</td>
<td>Ground</td>
</tr>
</tbody>
</table>
8 Specification Table

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of pan/tilt head supported</td>
<td>KXWELL series robotic heads or 3rd party brand*1</td>
</tr>
<tr>
<td>Control of pan/tilt head and lens</td>
<td>Variable speed control of robotic head and lens; iris and focus mode switching*2</td>
</tr>
<tr>
<td>Maximum control capacity</td>
<td>10</td>
</tr>
<tr>
<td>Preset positions</td>
<td>20 positions per channel, one-button operation</td>
</tr>
<tr>
<td>Remotely ON/OFF camera</td>
<td>Supported</td>
</tr>
<tr>
<td>Remote limit setup</td>
<td>Supported</td>
</tr>
<tr>
<td>Camera parameter setup</td>
<td>White Balance, Black Balance, White Balance Mode, Gain Mode and Control, Red Gain, Blue Gain, Profile, Color Bar, Master Black, Shutter, Menu Operation, etc.*2</td>
</tr>
<tr>
<td>Acceleration 1-100%</td>
<td>1: P/T delay START /STOP; 100: P/T immediate START /STOP operate by joystick. Set value depend on how stable the mounting base of the robotic head.</td>
</tr>
<tr>
<td>Auxiliary function</td>
<td>Support wiper on/off</td>
</tr>
<tr>
<td>Interface with KXWELL</td>
<td>Supported</td>
</tr>
<tr>
<td>Video Selector</td>
<td>Supported</td>
</tr>
<tr>
<td>On Air integrate</td>
<td>Supported via GPI out</td>
</tr>
<tr>
<td>Joystick sensitivity</td>
<td>1 - 10 levels</td>
</tr>
<tr>
<td>External interface ports</td>
<td>USB×1, TCP/IPx1, RS422×1, RS232x2, GPOx10, GPI×10</td>
</tr>
<tr>
<td>Supported protocols</td>
<td>KXWELL and VISCA protocols</td>
</tr>
<tr>
<td>Power supply</td>
<td>DC12V ±10%1200mA</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-10 ~ +45℃</td>
</tr>
<tr>
<td>Operating humidity</td>
<td>≤85% (non-condensing)</td>
</tr>
<tr>
<td>Dimension (L×W×H)</td>
<td>360 × 226 × 57mm (excluding joystick)</td>
</tr>
<tr>
<td></td>
<td>360 × 226 × 127mm (including joystick)</td>
</tr>
<tr>
<td>Weight</td>
<td>2.6kg</td>
</tr>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>May Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No power when switch on the controller.</td>
<td>1. Controller needs +12V, 3A DC power supply.</td>
<td>1. Check there is DC adapter for the controller; 2. Confirm the AC supply working properly; 3. Change the AC socket supply to reconfirm.</td>
</tr>
<tr>
<td>Powered on the controller but cannot control pan/tilt heads and cameras;</td>
<td>1. The controller and the pan/tilt head must configure to use the same link mode. 2. The controller and the pan/tilt head must configure to use the same communication protocol.</td>
<td>1. Check the RJ45 cable. Both controller and robotic head must connect use same interface communication. Either TCP/IP or RS422. 2. Check the communication protocol for controller and robotic head. It should identical. Refer to Section 4.11 Page - 18 -. For configuration.</td>
</tr>
<tr>
<td>No control when both controller and robotic head in TCP/IP in interface mode</td>
<td>Network parameters of controller and pan/tilt head must be configured correctly.</td>
<td>1. For IP control, ensure that the IP addresses of controller and pan/tilt head are in the same network sub mask and avoid IP conflict. 2. For public network control, configure the IP, sub mask, port forwarding, gateway, according to</td>
</tr>
</tbody>
</table>
| you in house network needs.  
3. Pan/tilt heads and cameras can be control normally when the LCD display show at [NOTE] on the third line in the main interface of controller is displayed as NORMAL-TCP.  
Refer to Section 4.11 on Page - 18 - and Section 5.18 on Page - 38 -.
KXWELL International Pte Ltd.

Website: http://www.kxwell.com

Official WeChat Account: KXWELL

The design and specification of the product is subject to change without notice

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