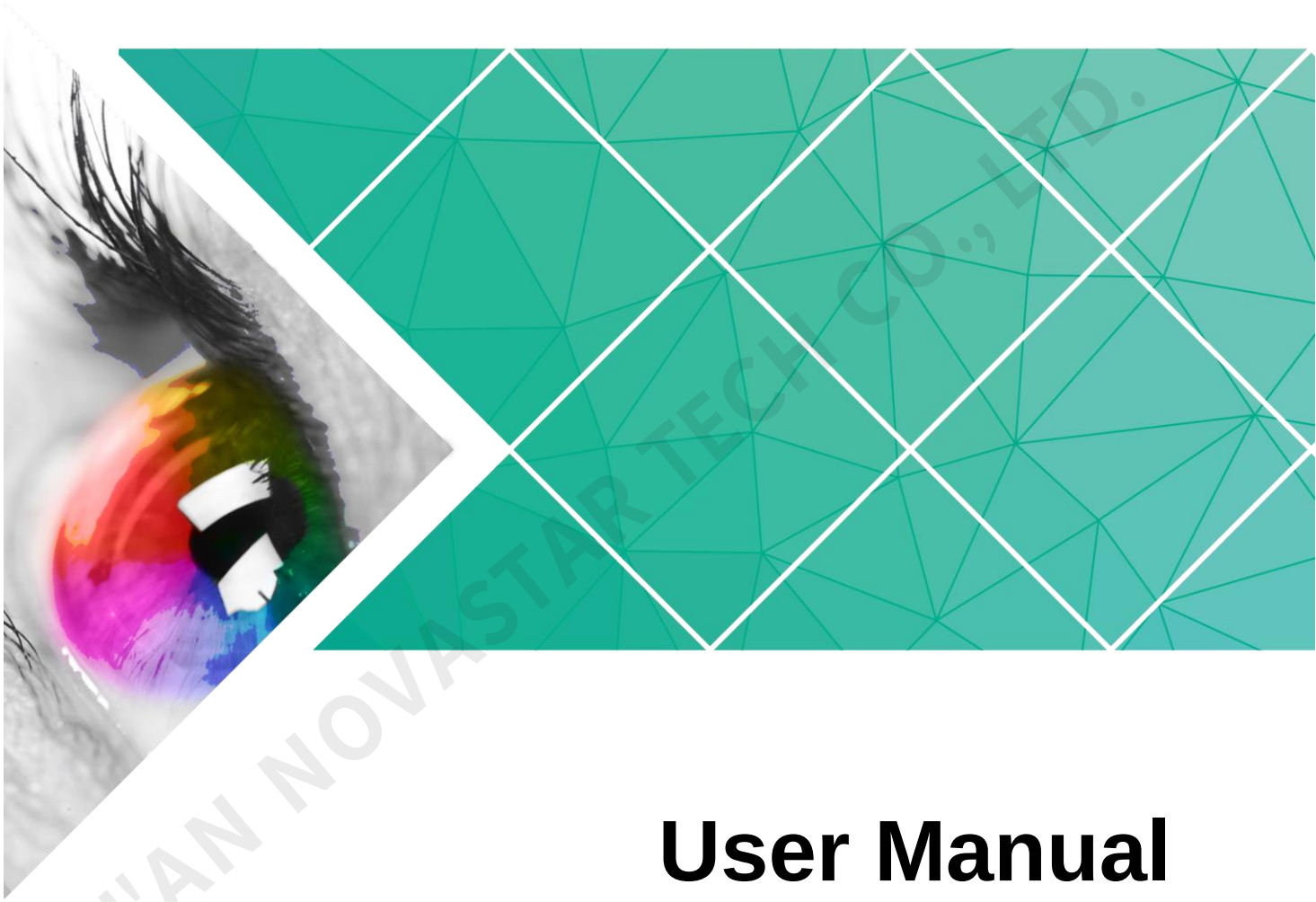
MCTRL660 PRO

Independent Controller



User Manual

XI'AN NOVASTAR TECH CO., LTD.

Product Version: V1.0.0

Document Number: NS110100560

Copyright © 2018 Xi'an NovaStar Tech Co., Ltd. All Rights Reserved.

No part of this document may be copied, reproduced, extracted or transmitted in any form or by any means without the prior written consent of Xi'an NovaStar Tech Co., Ltd.

Trademark

NOVASTAR is a trademark of Xi'an NovaStar Tech Co., Ltd.

Statement

You are welcome to use the product of Xi'an NovaStar Tech Co., Ltd. (hereinafter referred to as NovaStar). This document is intended to help you understand and use the product. For accuracy and reliability, NovaStar may make improvements and/or changes to this document at any time and without notice. If you experience any problems in use or have any suggestions, please contact us via contact info given in document. We will do our best to solve any issues, as well as evaluate and implement any suggestions.

XI'AN NOVASTAR TECH CO., LTD.

Change History

Version	Release Date	Description
V1.0.0	2018-09-26	First release

XI'AN NOVASTAR TECH CO., LTD.

Contents

Change History ii

1 Safety 1

1.1 Storage and Transport Safety 1

1.2 Installation and Use Safety 1

2 Overview 2

3 Features 3

3.1 Features 3

3.2 Video Source Features 3

4 Applications 5

5 Cascading Devices 7

6 Hardware Structure 8

6.1 Appearance 8

6.1.1 Front Panel 8

6.1.2 Rear Panel 8

6.2 Dimensions 9

7 Home Screen 10

7.1 Sending Card Mode 10

7.2 Fiber Converter Mode 11

8 Menu Operations 13

8.1 Quick Screen Configuration 13

8.1.1 Step 1 Setting Input Source 13

8.1.2 Step 2 Setting Input Resolution 14

8.1.3 Step 3 Quickly Configuring Screen 14

8.2 Brightness Adjustment 15

8.3 Screen Settings 16

8.3.1 Quick Configuration 16

8.3.2 Advanced Configuration 16

8.3.3 Auto Configuration 17

8.3.4 Image Offset 18

8.4 Input Settings 18

8.5 Display Control 18

XI'AN NOVASTAR TECH CO., LTD.

8.6 Image Mirroring 19
8.7 Backup and Restore 21
8.8 Advanced Settings 21
8.8.1 Mapping Function 22
8.8.2 Loading RCFG Files 22
8.8.3 Alarm Threshold Settings 23
8.8.4 Image Settings 23
8.8.5 Saving to RV Card 23
8.8.6 Redundancy 23
8.8.7 Presets 23
8.8.8 Inputs Backup 24
8.8.9 Low Latency 24
8.8.10 Color Depth 24
8.9 System Settings 25
8.10 Communication Settings 25
8.11 Working Mode 26
8.12 Language 27
9 Operations on PC 28
9.1 Individual Gamma Adjustment for RGB 28
9.2 Operations on Web Page 29
9.2.1 Environment Configuration 29
9.2.2 Applications 29
9.3 Software Operations on PC 30
9.3.1 NovaLCT 30
9.3.2 SmartLCT 31
9.4 Firmware Update 31
9.4.1 NovaLCT 31
9.4.2 SmartLCT 31
10 Specifications 32

XI'AN NOVASTAR TECH CO., LTD.

1 Safety

This chapter illustrates safety of the MCTRL660 PRO independent controller to ensure the product's storage, transport, installation and use safety.

Safety instructions are applicable to all personnel who come into contact with or use the product. Please pay attention to following points.

- Read through the instructions.
- Retain all instructions.
- Comply with all instructions.

1.1 Storage and Transport Safety

- Pay attention to dust and water prevention.
- Avoid long-term direct sunlight.
- Do not place the product in a position near fire and heat.
- Do not place the product in an area containing explosive materials.
- Do not place the product in a strong electromagnetic environment.
- Place the product in a stable position to prevent damage or personal injury caused by dropping.
- Save the packing box and materials for future storage and shipping of product. For maximum protection during storage and shipping, repack the product as it was originally packed at the factory.

1.2 Installation and Use Safety

- Only trained professionals may install the product.
- Plugging and unplugging operations are prohibited when the power is on.
- Ensure safe grounding of the product.
- Beware of electric shock hazards.
- Always wear a wrist band and insulating gloves.
- Do not place the product in an area that is frequently or strongly shaken.
- Perform regular dust removal.
- Rather than having the product disassembled and maintained by non-certified professionals, please contact NovaStar for maintenance at any time.
- Replace faulty parts only with the spare parts supplied by NovaStar.

XI'AN NOVASTAR TECH CO., LTD.

2 Overview

The MCTRL660 PRO is a professional controller developed by NovaStar. A single MCTRL660 PRO has a loading capacity of up to 1920×1200@60Hz. It allows users to customize resolutions to configure ultra-large screens with ultra-width or ultra-height.

The MCTRL660 PRO has various video connectors:

- Input connectors: 1 × 3G-SDI, 1 × HDMI 1.4a, 1 × single-link DVI
- Output connectors: 6 × Gigabit Ethernet ports, 2 × 10G optical ports
- Loop output connectors: 1 × 3G-SDI LOOP, 1 × HDMI 1.4a LOOP, 1 × DVI LOOP

The MCTRL660 PRO has many industry-leading advanced technologies:

- Input of ultra-high color depths, such as 10-bit/12-bit 4:4:4, with input resolutions up to 1920×1080@60Hz, increasing color expression capabilities by 4096 times compared to 8-bit inputs, and presenting images with rich and delicate colors, smoother transitions, as well as clearer details
- Individual Gamma adjustment for RGB, effectively controlling image non-uniformity under low grayscale and white balance offset to improve image quality
- A low latency of less than 1 frame (≤ 10 lines)
- Dual working modes: working as sending card and fiber converter
- One-click backup and recovery, quickly recovering previous screen configurations to deal with sudden on-site failure.
- Image mirroring, allowing for more cool and dazzling stage effects

The MCTRL660 PRO is mainly used for the rental and fixed fields, such as concerts, live events, security monitoring centers, Olympic Games and various sports centers.

XI'AN NOVASTAR TECH CO., LTD.

3 Features

3.1 Features

- Supports inputs of 10-bit/12-bit 4:4:4 ultra-high color depths and resolutions up to 1920×1080@60Hz.
- A low latency of less than 1 frame (≤ 10 lines)
- Auto LED screen configuration
- Web control
- Image mirror
- Dual working modes: working as sending card and fiber converter
- Pixel level brightness and chroma calibration
- Independent Gamma adjustment of RGB (Only the A8s receiving card supports this function)
- Monitoring of inputs
- One-click backup and recovery
- Multiple MCTRL660 PRO units can be cascaded.

3.2 Video Source Features

Input Connector	Features		
	Color Depth	Sampling Format	Resolution
HDMI 1.4a	8-bit	RGB 4:4:4 YCbCr 4:4:4 YCbCr 4:2:2 YCbCr 4:2:0	Maximum input resolution supported by standard program: 1920×1200@60Hz.
	10-bit/12-bit		• Maximum input resolution supported by standard program: 1920×960@60Hz. • Maximum input resolution supported by customized sending card and receiving card programs: 1920×1080@60Hz. Note: Customized program supports only A8s receiving card.
Single-link DVI	8-bit		Maximum input resolution supported by standard

XI'AN NOVASTAR TECH CO., LTD.

			program:1920×1200@60Hz.
	10-bit/12-bit		• Maximum input resolution supported by standard program: 1920×960@60Hz. • Maximum input resolution supported by customized sending card and receiving card programs: 1920×1080@60Hz. Note: Customized program supports only A8s receiving card.
3G-SDI	Maximum supported input resolution:1920×1080@60Hz Note: Do not support setting the resolutions for 3G-SDI input sources.		

XI'AN NOVASTAR TECH CO., LTD.

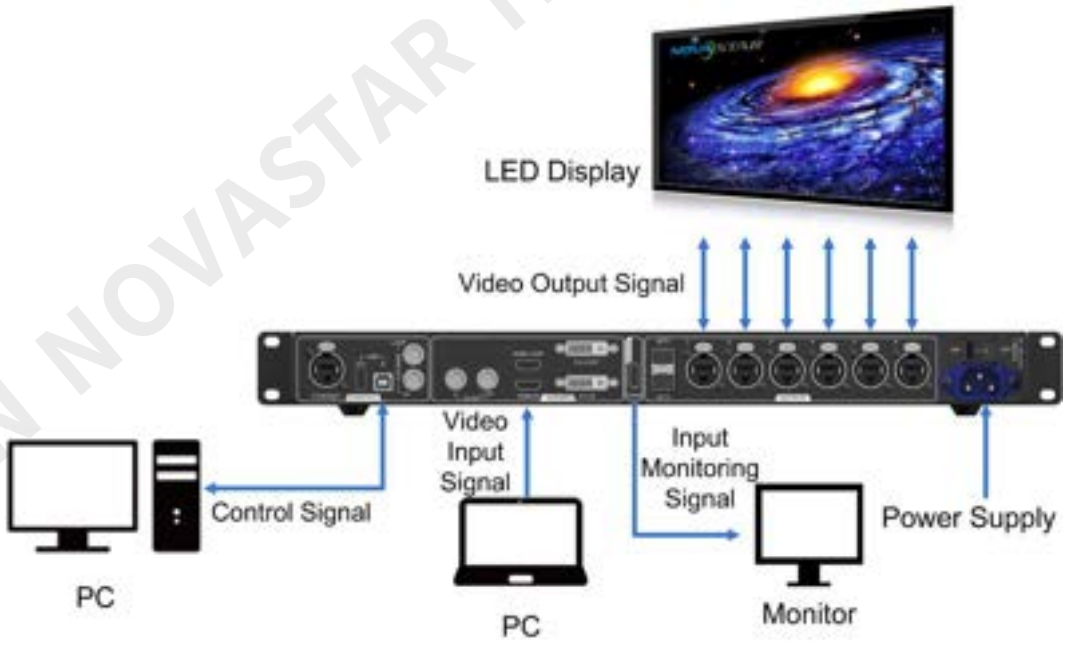
4 Applications

The MCTRL660 PRO can work as a sending card or fiber converter, meeting multiple application needs.

Scenario 1: Application of Sending Card Mode

On the OLED menu screen, choose **Working Mode** > **Sending Card**. This mode uses the optical ports or Gigabit Ethernet ports to output video signals.

Figure 4-1 Application of sending card mode

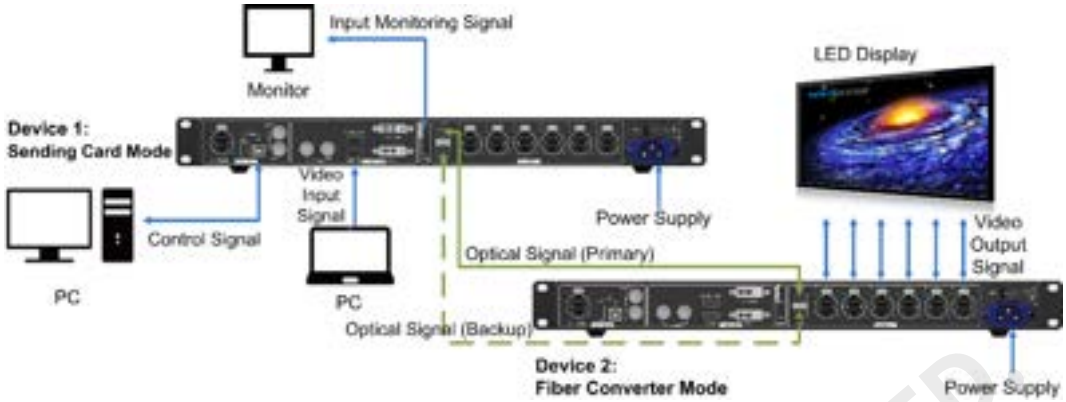


Scenario 2: Application of Fiber Converter Mode

Set the working mode for the two devices respectively, as shown in Figure 4-2. Device 2 uses the optical ports (for input/output) and Gigabit Ethernet ports (for output/input) to realize optical and electric signal conversion, which allows for long-distance signal transmission.

XI'AN NOVASTAR TECH CO., LTD.

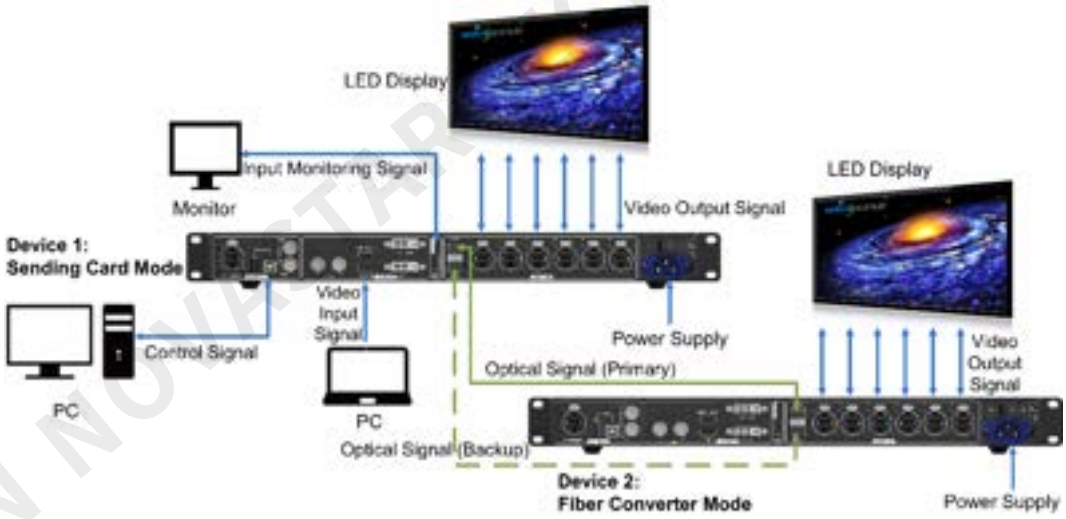
Figure 4-2 Application of fiber converter mode



Scenario 3: Application of Dual-Output Working Mode

Set the working mode for the two devices respectively, as shown in Figure 4-3. Device 1 uses the optical ports and Gigabit Ethernet ports to output video signals at the same time.

Figure 4-3 Application of dual-output working mode

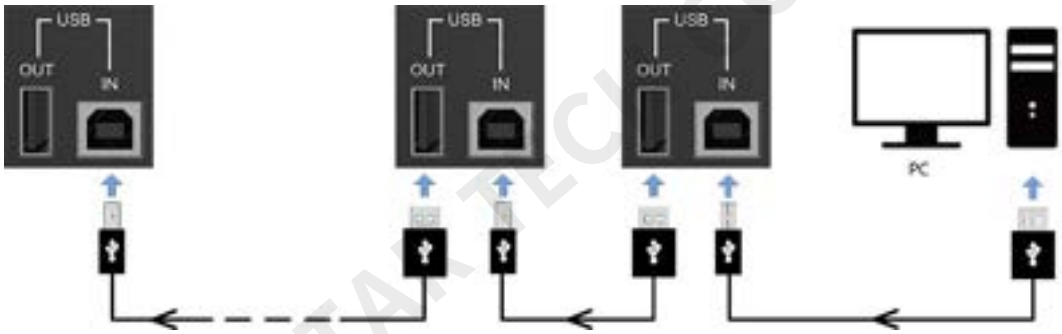


XI'AN NOVASTAR TECH CO., LTD.

5 Cascading Devices

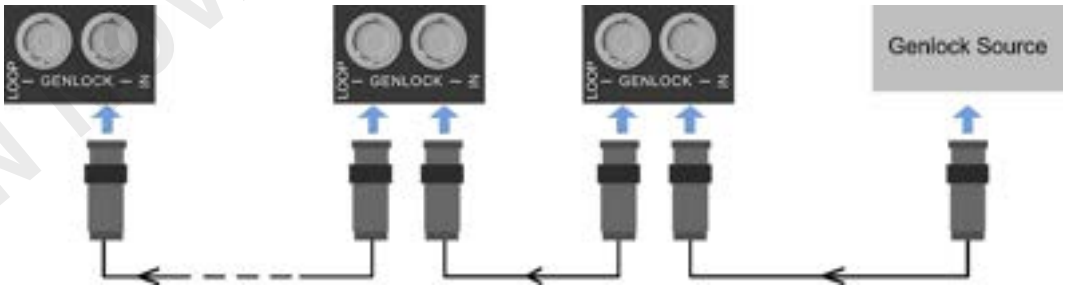
- The control computer needs to control multiple MCTRL660 PRO devices.

  Cascade devices via USB IN and USB OUT ports of the MCTRL660 PRO devices. Up to 8 devices can be cascaded.



- Multiple MCTRL660 PRO devices need to be genlocked.

  Cascade devices via GENLOCK IN and GENLOCK LOOP connectors of the MCTRL660 PRO devices. Up to 8 devices can be cascaded.

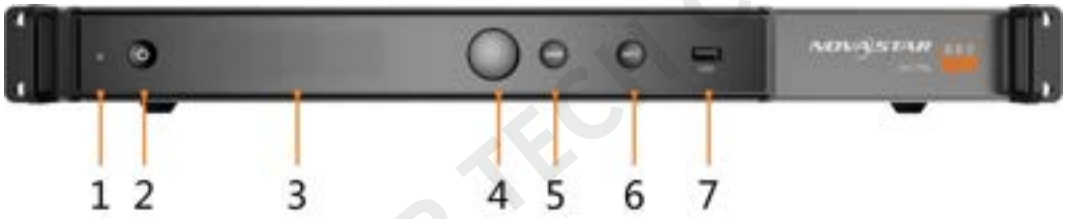


XI'AN NOVASTAR TECH CO., LTD.

6 Hardware Structure

6.1 Appearance

6.1.1 Front Panel



No.	Description
1	Operating indicator
2	Standby button
3	OLED operation screen
4	Function knob
5	**BACK** button: Press to go back to previous menu.
6	**INPUT** button: Press to choose a video source.
7	USB port: Used to update firmware

6.1.2 Rear Panel

Connector Type	Connector Quantity	Connector Name
Input	1	DVI IN
	1	HDMI IN
	1	3G-SDI IN

XI'AN NOVASTAR TECH CO., LTD.

Output	6	RJ45 (Gigabit Ethernet ports)
	2	OPT1/OPT2 (10G optical ports)
	1	DVI LOOP
	1	HDMI LOOP
	1	3G-SDI LOOP
MONITOR	1	HDMI (Output)
Control	1	GENLOCK IN
	1	GENLOCK LOOP
	1	ETHERNET (Fast Ethernet port)
	1	USB IN
	1	USB OUT
Power	1	100 V–240 V AC

6.2 Dimensions

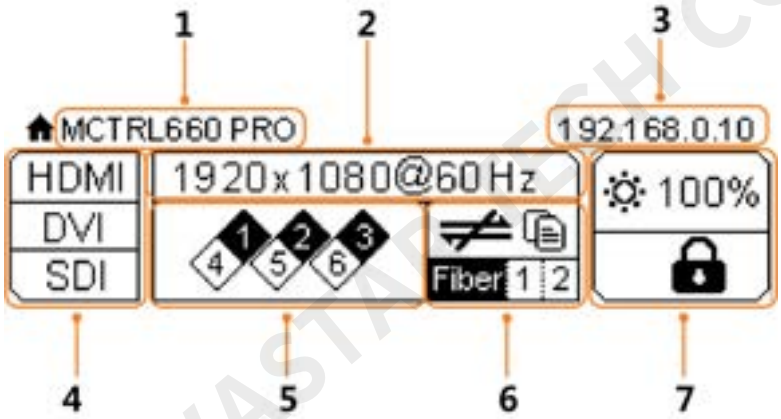
Unit: mm

XI'AN NOVASTAR TECH CO., LTD.

7 Home Screen

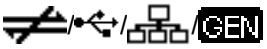
7.1 Sending Card Mode

In the sending card mode, the home screen of the MCTRL660 Pro is shown below.



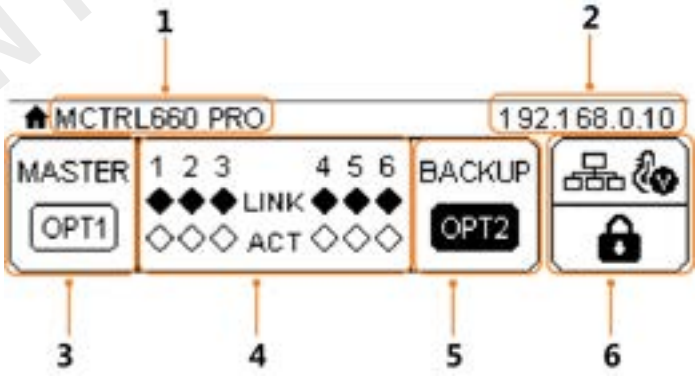
No.	Description	
1	Device name	
2	The currently selected input source and its resolution and refresh rate	
3	IP address	
4	Different types of video sources and their connection statuses	
5	Ethernet port connection status • Always on: The Ethernet port connection works and the port serves as master. • Off: The Ethernet port is not connected or the connection does not work. • A mark (not flashing) on top corner of icon: The Ethernet port is in redundancy status, but the redundancy has not taken effect. • A mark (flashing) on top corner of icon: The Ethernet port is in redundancy status and the redundancy has taken effect.	
6	Operating status	
		The system configuration file is backed up/not backed up.

XI'AN NOVASTAR TECH CO., LTD.

No.	Description	
		(The voltage and temperature alarm status has the display priority here.)
		Voltage alarm / Temperature alarm / Voltage and temperature alarms (When there are no such alarms, the backup status is displayed here.)
	Fiber 1–2	Optical port connection status: • Always on: The optical port connection works and the port serves as master. • Off: The optical port is not connected or the connection does not work.
		Connection status of control ports: Not connected / USB connected / Ethernet connected / GENLOCK connected When USB port, Ethernet port and GENLOCK connector are all connected to the control computer, their priority in control is GENLOCK > USB > ETHERNET.
7		LED screen brightness
		Buttons on the front panel are locked/unlocked.

7.2 Fiber Converter Mode

In the fiber converter mode, the home screen of the MCTRL660 Pro is shown below.



No.	Description
1	Device name
2	IP address

XI'AN NOVASTAR TECH CO., LTD.

No.	Description	
3	The OPT1 port is the master input/output optical port, corresponding to the 6 Gigabit Ethernet ports. The OPT1 icon has different statuses: – Always on: The OPT1 port connection works. – Off: The OPT1 port is not connected or the connection does not work.	
4	• 1–6: Indicate Ethernet ports 1–6. • **LINK**: Ethernet port connection status The following diamond icon status indicates the Ethernet connection status. – Always on: The Ethernet port connection works. – Off: The Ethernet port is not connected or the connection does not work. • **ACT**: Signal transmission status of Ethernet port The following diamond icon status indicates the signal transmission status of Ethernet port. – Flashing: The Ethernet port is transmitting signals. – Off: The Ethernet port is not transmitting signals.	
5	The OPT2 port works as the backup input/output port of OPT1. • Always on: The OPT2 port connection works. • Off: The OPT2 port is not connected or the connection does not work.	
6	Operating status	
		Normal voltage and temperature / Voltage alarm / Temperature alarm / Voltage and temperature alarms
		Connection status of control ports: Not connected / USB connected / Ethernet connected When both USB and Ethernet ports are connected to the control computer, USB port has the priority in control.
		Buttons on the front panel are locked/unlocked.

XI'AN NOVASTAR TECH CO., LTD.

8 Menu Operations

The MCTRL660 PRO is powerful and easy to use. You can quickly configure the LED screen to light it up and display the entire input source following steps in 8.1 Quick Screen Configuration. With other menu settings, you can further improve the LED screen display effect.

Instruction on knob operations:

- Press the knob to enter a menu page or confirm an operation.
- Rotate the knob to select a menu item or adjust a menu parameter.
- Hold the knob and **BACK** button simultaneously for 2 seconds to lock or unlock all the buttons.

8.1 Quick Screen Configuration

Following the steps below, namely **Setting Input Source** > **Setting Input Resolution** > **Quickly Configuring Screen**, you can quickly light up the LED screen to display the entire input source.

8.1.1 Step 1 Setting Input Source

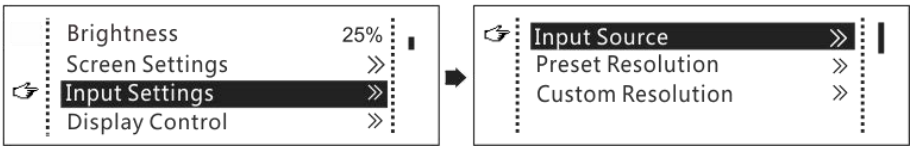
Supported input sources include 3G-SDI, Single-Link DVI and HDMI 1.4a. Select an input source that matches the type of the inputted external video source.

Constraints on input sources:

- Only one video input source can be selected at the same time.
- Interlaced SDI video sources do not support low latency.
- SDI video sources do not support the following functions:
  - Color depth adjustment
  - Image mirroring
  - Contrast, saturation and hue adjustment

XI'AN NOVASTAR TECH CO., LTD.

Figure 8-1 Input source settings



Step 1 On the home screen, press the knob to enter the menu.

Step 2 Chose **Input Settings** > **Input Source** to enter its submenu.

Step 3 Select the target video source and press the knob to enable it.

8.1.2 Step 2 Setting Input Resolution

Note: SDI input sources do not support input resolution settings.

The input resolution can be set through either of the following methods.

Method 1: Selecting a Preset Resolution

Select an appropriate preset resolution and refresh rate as the input resolution.

Step 1 On the home screen, press the knob to enter the menu.

Step 2 Choose **Input Settings** > **Preset Resolution** to enter its submenu.

Step 3 Select a resolution and a refresh rate, and press the knob to apply them respectively.

The MCTRL660 PRO supports the following preset resolutions.

- 1024×768@(24/30/48/50/60/72/75/85/100/120)Hz
- 1280×1024@(24/30/48/50/60/72/75/85)Hz
- 1366×768@(24/30/48/50/60/72/75/85/100)Hz
- 1440×900@(24/30/48/50/60/72/75/85)Hz
- 1600×1200@(24/30/48/50/60)Hz
- 1920×1080@(24/30/48/50/60)Hz
- 1920×1200@(24/30/48/50/60)Hz
- 2560×960@(24/30/48/50)Hz
- 2560×1600@(24/30)Hz

Method 2: Customizing a Resolution

Customize a resolution by setting a custom width, height and refresh rate.

Step 1 On the home screen, press the knob to enter the menu.

Step 2 Choose **Input Settings** > **Custom Resolution** to enter its submenu and set the screen width, height and refresh rate.

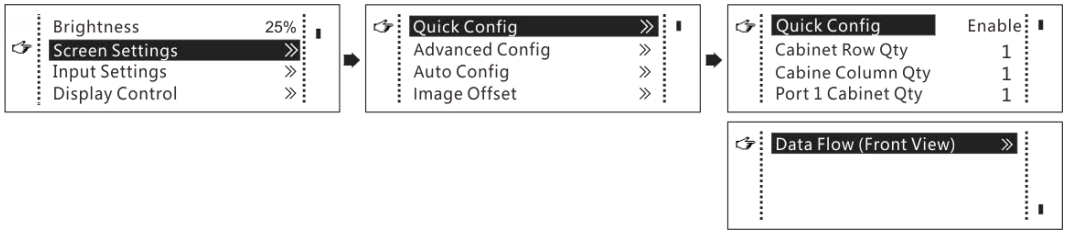
Step 3 Select **Apply** and press the knob to apply the custom resolution.

8.1.3 Step 3 Quickly Configuring Screen

This function is used to quickly configure a screen.

XI'AN NOVASTAR TECH CO., LTD.

Figure 8-2 Quick configuration



Step 1 On the home screen, press the knob to enter the menu.

Step 2 Choose **Screen Settings** > **Quick Config** to enter its submenu.

Step 3 Enable **Quick Config** and set the parameters.

- Set **Cabinet Row Qty** and **Cabinet Column Qty** (number of cabinet rows and columns to be loaded).
- Set **Port 1 Cabinet Qty** (number of cabinets loaded by Ethernet port 1). The device has restrictions on the number of cabinets loaded by the Ethernet ports. For details, see Note a).
- Set **Data Flow** of the screen. For details, see Note c), d), and e).

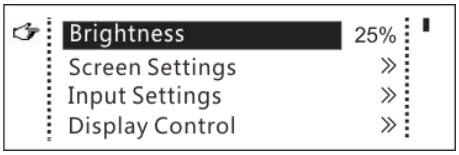
Note	
a). If *n* ports are used to load the screen, the number of cabinets loaded by each of the first (*n*–1) ports must be the same and the integral multiple of the number of cabinet rows or columns, and it cannot be less than the number of cabinets loaded by the last port.	Example: If all the 6 Ethernet ports are used to load the screen, the number of cabinets loaded by ports 1–5 must be the same and the integral multiple of the number of cabinet rows or columns. Therefore, you need to set only the number of cabinets loaded by port 1 according to the actual situation. The number of cabinets loaded by port 6 must be less than or equal to the number of cabinets loaded by port 1.
b). Irregular screens must be configured in NovaLCT.	
c). Rotate the knob to select the target data flow which can be previewed on the LED screen in real time and then press the knob to save the one you selected.	
d). Ensure that the cabinets loaded by each Ethernet port are connected one by one in the same direction.	
e). Ensure that the Ethernet port 1 is at the beginning position of the whole physical connection.	

8.2 Brightness Adjustment

Adjust the LED screen brightness value based on the current ambient brightness and eye comfort. Appropriate brightness can extend life of LEDs in LED screen.

XI'AN NOVASTAR TECH CO., LTD.

Figure 8-3 Brightness adjustment



Step 1 On the home screen, press the knob to enter the menu.

Step 2 Select **Brightness** and press the knob to enter the adjustment status.

Step 3 Rotate the knob to adjust the brightness value. The LED screen displays the adjustment effect in real time. Press the knob to apply the brightness value.

8.3 Screen Settings

Configure the LED screen to ensure the screen can display the whole image normally.

Screen configuration methods include quick, advanced and auto configurations. There are constrains on these methods, explained as below.

- The three methods cannot be used at the same time.
- When you are configuring screen in NovaLCT, the three configuration methods on The MCTRL 660 PRO are disabled.

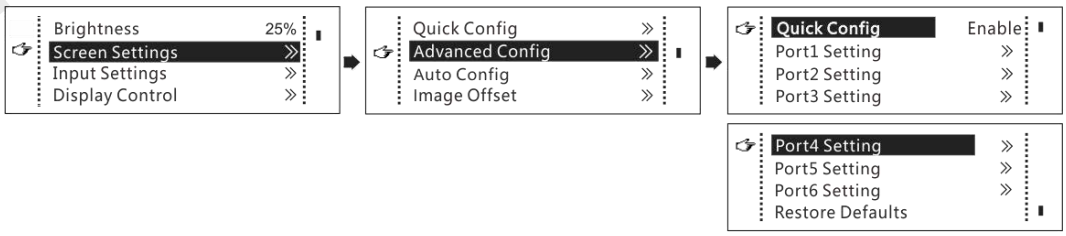
8.3.1 Quick Configuration

Configure the whole LED screen uniformly and quickly. For details, see 8.1.3 Step 3 Quickly Configuring Screen.

8.3.2 Advanced Configuration

Set parameters for each Ethernet port, including number of cabinet rows and columns (**Cabinet Row Qty** and **Cabinet Column Qty**), horizontal offset (**Start X**), vertical offset (**Start Y**), and data flow.

Figure 8-4 Advanced configuration



Step 1 On the home screen, press the knob to enter the menu.

Step 2 Choose **Screen Settings** > **Advanced Config** to enter its submenu.

Step 3 Enable **Advance Config** and set the parameters.

XI'AN NOVASTAR TECH CO., LTD.

8.3.3 Auto Configuration

Note: Each Ethernet port must load only a whole row or column of cabinets.

Figure 8-5 Each Ethernet port loading only one row of cabinets

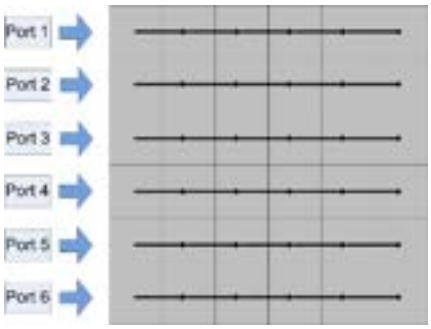


Figure 8-6 Each Ethernet port loading only one column of cabinets

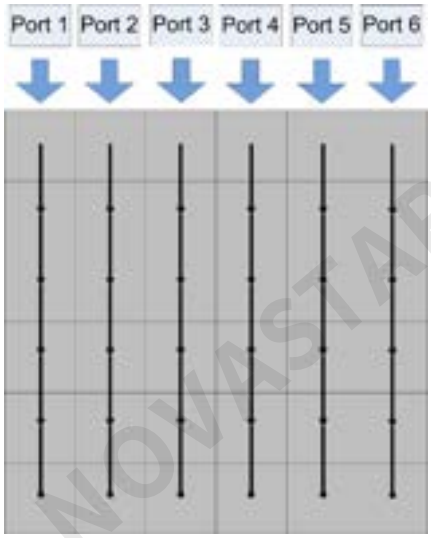
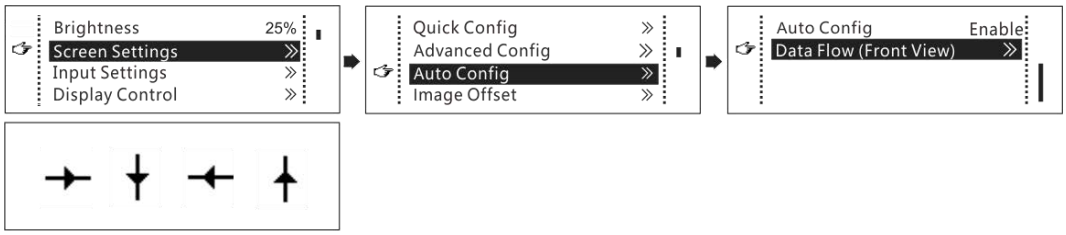


Figure 8-7 Auto configuration



Step 1 On the home screen, press the knob to enter the menu.

Step 2 Choose **Screen Settings** > **Auto Config** to enter its submenu.

Step 3 Enable **Auto Config** and select a data flow.

XI'AN NOVASTAR TECH CO., LTD.

8.3.4 Image Offset

After configuring the screen, adjust the horizontal and vertical offsets (**Start X** and **Start Y**) of the overall displayed image to ensure it is displayed in the target position.

Figure 8-8 Image offset

Step 1 On the home screen, press the knob to enter the menu.

Step 2 Choose **Screen Settings** > **Image Offset** to enter its submenu.

Step 3 Set the **Start X** and **Start Y** values.

8.4 Input Settings

Set the input source and input resolution.

Input Source Settings

On the OLED menu screen, select an input source that matches the type of the inputted external video source. Only one video input source can be selected at the same time. For details, see 8.1.1 Step 1 Setting Input Source.

Input Resolution Settings

Set a preset or custom resolution for the selected input source. For details, see 8.1.2 Step 2 Setting Input Resolution.

8.5 Display Control

Control the status of display on the LED screen.

Figure 8-9 Display control

Normal: The LED screen displays the current input source normally.

Black Out: The LED screen goes black and does not display input source still being played in the background.

Freeze: The LED screen always displays the frame when frozen. The input source is still being played in the background.

Test Pattern: Test patterns are used to check the display effect and pixel operating status. There are 8 test patterns, including pure colors and line patterns.

XI'AN NOVASTAR TECH CO., LTD.

Step 1 On the home screen, press the knob to enter the menu.

Step 2 Choose **Display Control** to enter its submenu.

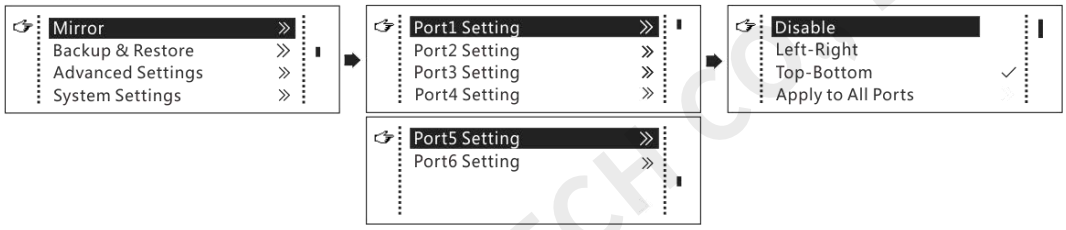
Step 3 Select a control mode and press the knob to apply it.

8.6 Image Mirroring

Mirror images displayed on the LED screen. You can disable mirroring, mirror the image from left to right or from top to bottom. The image mirroring is based on the entire output image.

Constrain: Image mirroring and low latency cannot be enabled at the same time.

Figure 8-10 Image mirroring



Step 1 On the home screen, press the knob to enter the menu.

Step 2 Select **Mirror** and press the knob to enter its submenu.

Step 3 Set the mirroring mode for the image loaded by current Ethernet port.

Step 4 (Optional) Select **Apply to All Ports** and press the knob. The mirroring settings will take effect on all other Ethernet ports automatically.

The mirroring effects are illustrated in the following figures.

Figure 8-11 Left-right mirroring of the image loaded by Ethernet port 1

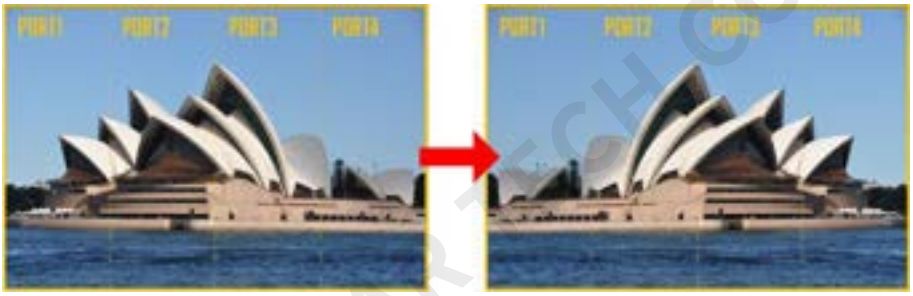
As shown above, after you set the mirroring mode as left-right for Ethernet port 1, the image displayed in the Ethernet port 1 area changed to the left-right mirrored image of the image loaded by Ethernet port 4. That is to say, the entire image is mirrored horizontally, but only the Ethernet port 1 area displays the partial mirrored image.

XI'AN NOVASTAR TECH CO., LTD.

Figure 8-12 Left-right mirroring of images loaded by Ethernet port 1 and 2

As shown above, after you set the mirroring mode as left-right for Ethernet ports 1-2, the images displayed in the areas of Ethernet ports 1-2 changed to the left-right mirrored images of the images loaded by Ethernet ports 3-4. That is to say, the entire image is mirrored horizontally, but only the areas of Ethernet ports 1-2 display the partial mirrored images.

Figure 8-13 Left-right mirroring of the entire image



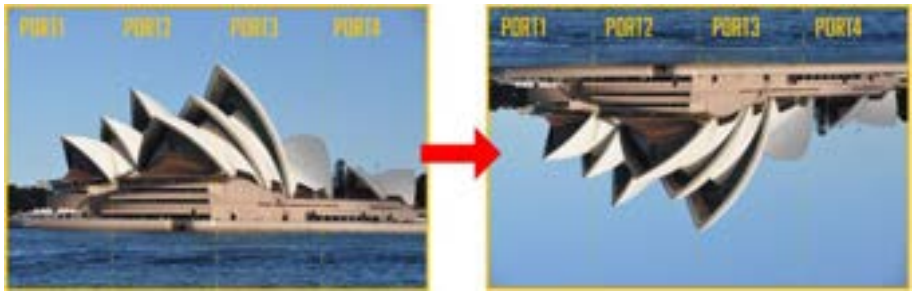
As shown above, after you set the mirroring mode as left-right for Ethernet ports 1-4, the entire image is mirrored horizontally.

Figure 8-14 Top-bottom mirroring of the image loaded by Ethernet port 1

As shown above, after you set the mirroring mode as top-bottom for Ethernet port 1, the image loaded by Ethernet port 1 will be mirrored vertically. That is to say, the entire image is mirrored vertically, but only the Ethernet port 1 area displays the partial mirrored image.

XI'AN NOVASTAR TECH CO., LTD.

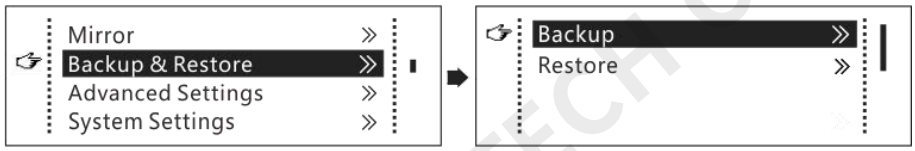
Figure 8-15 Top-bottom mirroring of the entire image



As shown above, after you set the mirroring mode as top-bottom for Ethernet ports 1-4, the entire image is mirrored vertically.

8.7 Backup and Restore

Figure 8-16 Backup and restore

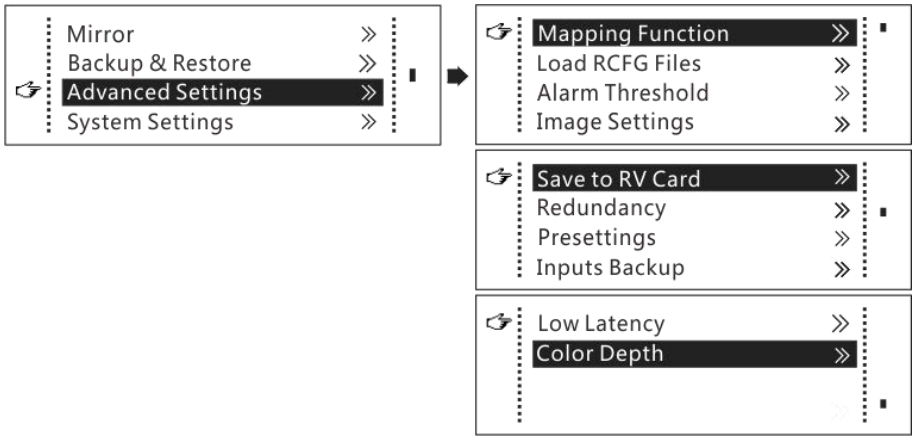


- Back up the system configuration to the controller.
- Restore the system configuration from the controller.
- Restore the receiving card configuration from the controller.
- Restore the sending card configuration from the controller.

System configuration includes configuration files of the sending card (namely the controller) and receiving cards.

8.8 Advanced Settings

Figure 8-17 Advanced settings



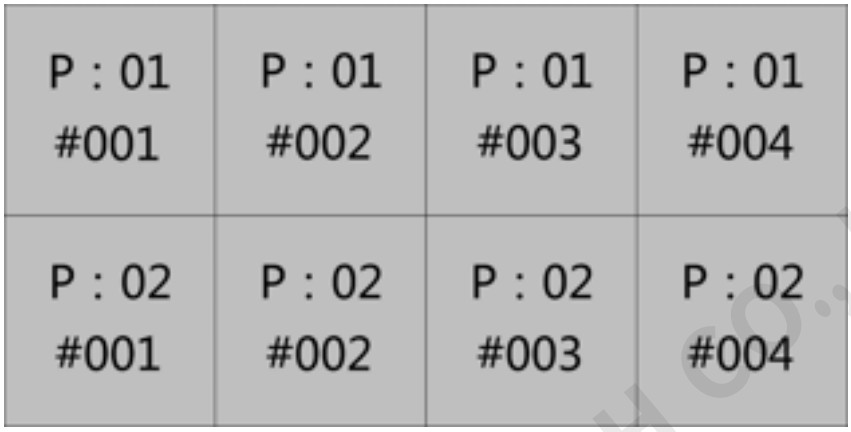
XI'AN NOVASTAR TECH CO., LTD.

8.8.1 Mapping Function

When mapping function is enabled, each of the cabinets will display its cabinet No. and the No. of the Ethernet port that loads the cabinet.

Note: Receiving cards used by the system must support mapping function.

Figure 8-18 Illustration of mapping function



Example: **P: 01** indicates the Ethernet port No. **#001** indicates the cabinet No.

8.8.2 Loading RCFG Files

Before you begin: Save the cabinet configuration file (*.rcfgx or *.rcfg) to the local PC.

Note: Configuration files of irregular cabinets are not supported.

Step 1 Run NovaLCT and choose **Tools** > **Controller Cabinet Configuration File Import**.

Step 2 On the displayed page, select the currently used serial port or Ethernet port, click **Add Configuration File** to select and add a cabinet configuration file.

Step 3 Click **Save the Change to HW** to save the change to the controller.

XI'AN NOVASTAR TECH CO., LTD.

8.8.3 Alarm Threshold Settings

Set the alarm thresholds for device temperature and voltage. When a threshold is exceeded, its corresponding icon will be flashing, instead of displaying the value.

- : Voltage alarm, icon flashing. Voltage threshold range: 3.5 V–7.5 V).
- : Temperature alarm, icon flashing. Temperature threshold range: -20°C–85°C).
- : Voltage and temperature alarms at the same time, icon flashing.

Note: When there are no temperature or voltage alarms, the home screen will display the backup status.

8.8.4 Image Settings

Adjust the color of parameters of the output image on the LED screen.

Table 8-1 Image parameters

Parameter	Description
Color temperature	Range: 4000 K–9500 K, Stepping: 100
Red Green Blue	Range: 0–255, Stepping: 1
Gamma	Range: 1.0–4.0, Stepping: 0.1
Contrast	Range: 0%–100%, Stepping: 1
Saturation	Range: 0%–100%, Stepping: 1
Hue	Range: 0–180, Stepping: 1

8.8.5 Saving to RV Card

Send and save the configuration parameters of the controller to the receiving cards and those parameters will not be lost after the controller is powered off.

8.8.6 Redundancy

Set the controller as the primary or backup device. When the controller works as a backup device, set the data flow direction as opposite to that of the primary device.

If the controller is set as the backup device, when the primary device fails, the backup device will immediately take over the work of the primary device, that is, the backup takes effect. After the backup takes effect, the target Ethernet port icons on the home screen will have marks on top flashing once every 1 second.

8.8.7 Presets

Choose **Advanced Settings** > **Presettings** to save current settings as a template. Up to 10 presets can be saved.

- **Save**: Save current parameters as a preset.

XI'AN NOVASTAR TECH CO., LTD.

- **Load**: Read back the parameters from the saved preset.
- **Delete**: Delete the parameters saved in the preset.

8.8.8 Inputs Backup

Set a backup video source for each primary video source. Other input video sources supported by the controller can be set as backup video sources.

After a backup video source takes effect, the video source selection is irreversible.

Table 8-2 Video source backup

Backup No.	Primary Video Source	Backup Video Source
Backup 1	SDI	NULL/DVI/HDMI
Backup 2	HDMI	NULL/DVI/SDI
Backup 3	DVI	NULL/SDI/HDMI

8.8.9 Low Latency

Low latency is used to reduce the time delay between the input of video signal to the controller and the corresponding output. To enable low latency, you need to set the horizontal resolution loaded by a single Ethernet port less than or equal to 512 pixels.

Low latency cannot be enabled with any of the following functions at the same time.

- Image mirroring
- Input of interlaced SDI video sources
- GENLOCK

8.8.10 Color Depth

Set the color depth of input source, including 8 bit, 10 bit and 12 bit.

Constraints: SDI video sources do not support adjustment of input color depth.

Figure 8-19 Color depth

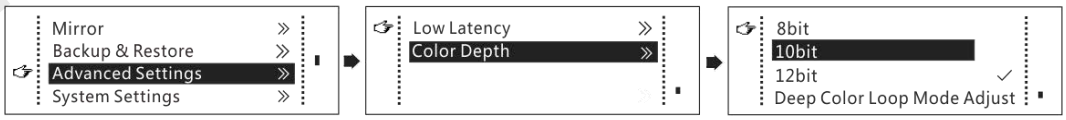


Table 8-3 Input color depth adjustment

Color Depth of Input Source	Description
8bit	Input of 8-bit input source does not change the controller's loading capacity. You cannot perform deep color loop mode adjustment.
10bit	Input of 10-bit input source reduces the controller's loading capacity by half. You can perform deep color loop mode adjustment.

XI'AN NOVASTAR TECH CO., LTD.

12bit	Input of 12-bit input source reduces the controller's loading capacity by half. You cannot perform deep color loop mode adjustment.

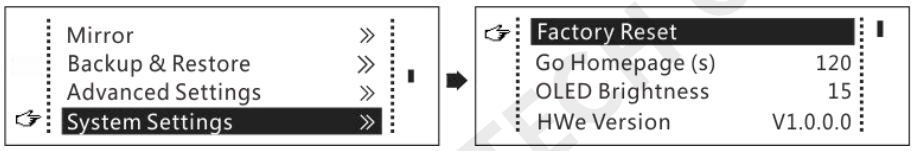
Video sources with different color depths support different input resolutions. For details, see 3.2 Video Source Features.

Deep Color Loop Mode Adjust

When multiple MCTRL660 PRO units are cascaded, if the color depth of the output video source on current device does not match the color depth of the video source inputted from the previous device, you can select this function on the previous device to adjust the loop output.

8.9 System Settings

Figure 8-20 System settings



Factory Reset

Reset the controller to factory settings.

Go Homepage (s)

Set the time of staying on the current screen before going back to the homepage when no action is performed. The time range is 30s to 3600s.

OLED Brightness

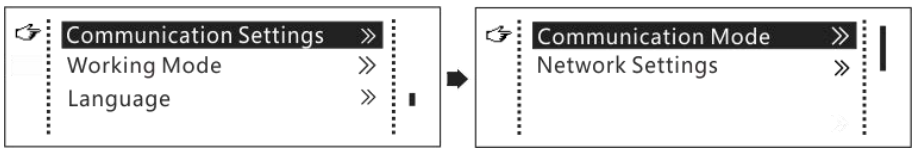
Adjust the brightness of the OLED menu screen on the front panel.

Hardware Version

Check the hardware version of the controller. If a new version is released, you can update the firmware programs in NovaLCT or SmartLCT.

8.10 Communication Settings

Set the communication mode and network parameters of the MCTRL660 PRO.



XI'AN NOVASTAR TECH CO., LTD.

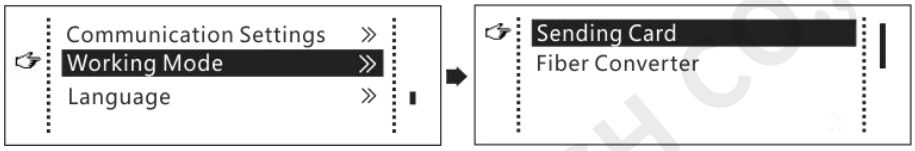
- Communication mode: USB preferred and Local Area Network (LAN) preferred

  The controller connects to PC via the USB port or ETHERNET port. If **USB Preferred** is selected, the PC prefers to communicate with the controller via the USB port, or else via the ETHERNET port.

- Network settings can be manual or automatic.
  - Manual settings parameters include controller IP address and subnet mask.
  - Automatic settings can read the network parameters automatically.
- Reset: Reset the network parameters to default values.

8.11 Working Mode

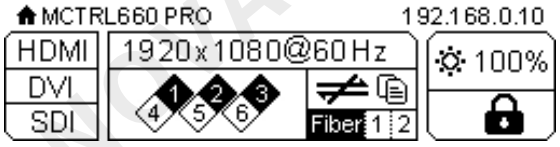
The MCTRL660 PEO allows you to switch between sending card mode and fiber converter mode.



Sending Card Mode

On the OLED menu screen, set the working mode as **Sending Card**. Both the optical ports and Gigabit Ethernet ports can work as output ports to output video signals. You can refer to Scenario 1: Application of Sending Card Mode. The home screen in sending card mode is shown below.

Figure 8-21 Home screen in sending card mode

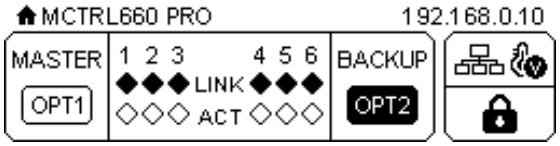


Fiber Converter Mode

- Only communication settings and working mode settings are available.
- The temperature and voltage alarm ranges are the same as their last settings.

On the OLED menu screen, set the working mode as **Fiber Converter**. The optical ports (for input/output) and Gigabit Ethernet ports (for output/input) are used to realize conversion between optical and electric signals. You can refer to Scenario 2: Application of Fiber Converter Mode. The home screen in fiber converter mode is shown below.

Figure 8-22 Home screen in fiber converter mode



XI'AN NOVASTAR TECH CO., LTD.

8.12 Language

Change the user interface language of the OLED menu screen.

XI'AN NOVASTAR TECH CO., LTD.

9 Operations on PC

9.1 Individual Gamma Adjustment for RGB

This function can effectively control image non-uniformity under low grayscale and white balance offset to improve the LED screen's image quality.

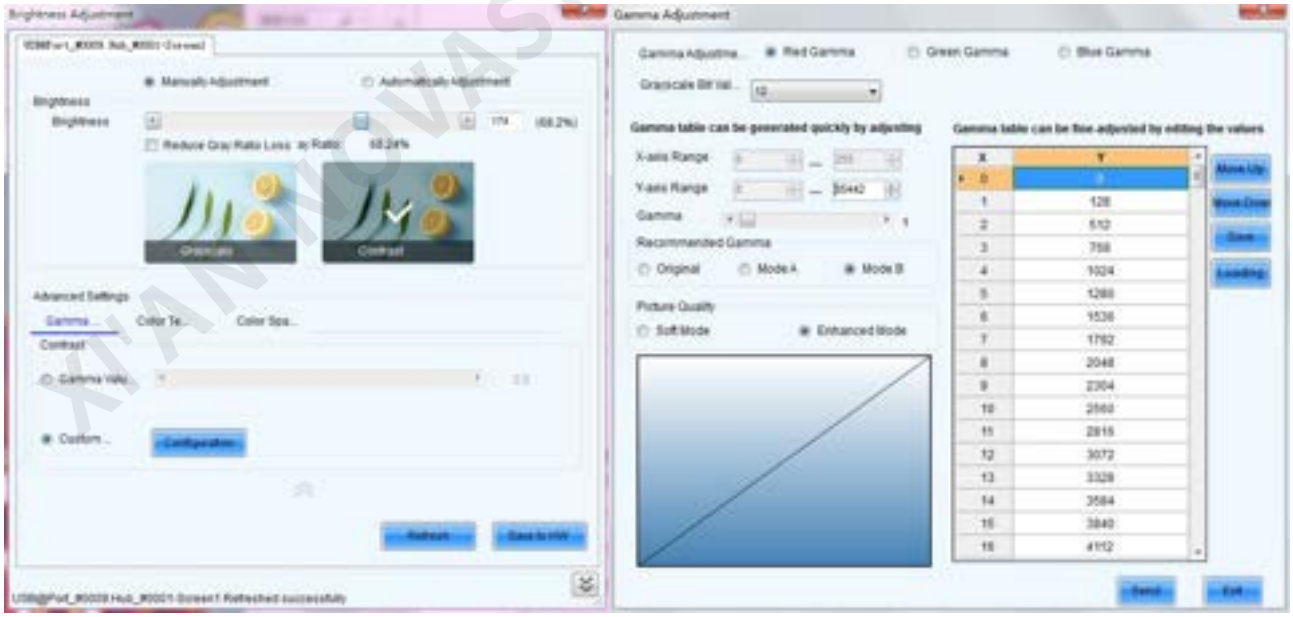
Note: Only the A8s receiving card supports this function.

Step 1 Run NovaLCT and choose **Brightness** > **Manually Adjustment**.

Step 2 Under **Advanced Settings**, choose **Gamma** > **Custom Gamma Adjustment** and click **Configuration** to enter the **Gamma Adjustment** page.

Step 3 Adjust **Red Gamma**, **Green Gamma** and **Blue Gamma**, respectively.

Step 4 Click **Send**.



XI'AN NOVASTAR TECH CO., LTD.

9.2 Operations on Web Page

The MCTRL660 PRO supports screen configuration on web page, allowing for more convenient screen configuration.

Note:

Operations that cannot be done on web page: backup and restore, loading RCFG files), presettings, inputs backup, system settings, communication mode settings, and working mode settings.

9.2.1 Environment Configuration

Step 1 Connect the MCTRL660 PRO to PC (or mobile device).

- Scenario 1: MCTRL660 PRO connected to PC Via Ethernet cable
- Scenario 2: MCTRL660 PRO connected to PC (or mobile device) via router to the same LAN

Step 2 Set the PC (or mobile device) and the MCTRL660 PRO on the same LAN.

Step 3 Obtain the IP address of the MCTRL660 PRO.

Step 4 On the browser, enter the IP address to enter the operation page.

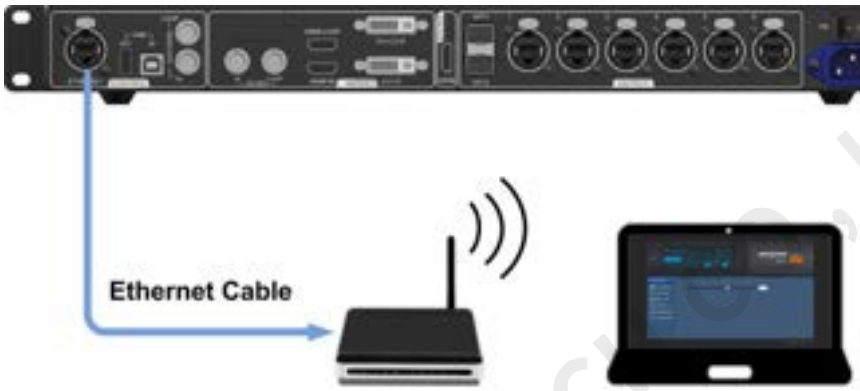
Note: .Google Chrome is recommended. (Safari browser can also be used on iOS.)

9.2.2 Applications

- Scenario 1: MCTRL660 PRO connected to PC via Ethernet cable

XI'AN NOVASTAR TECH CO., LTD.

- Scenario 2: MCTRL660 PRO connected to PC (or mobile device) via LAN



9.3 Software Operations on PC

9.3.1 NovaLCT

Connect the MCTRL660 PRO to the control computer installed with NovaLCT V5.1.0 or later via USB cable to perform screen configuration, brightness adjustment, calibration, display control, monitoring, etc. For details on their operations, see *NovaLCT LED Configuration Tool for Synchronous System User Guide*.

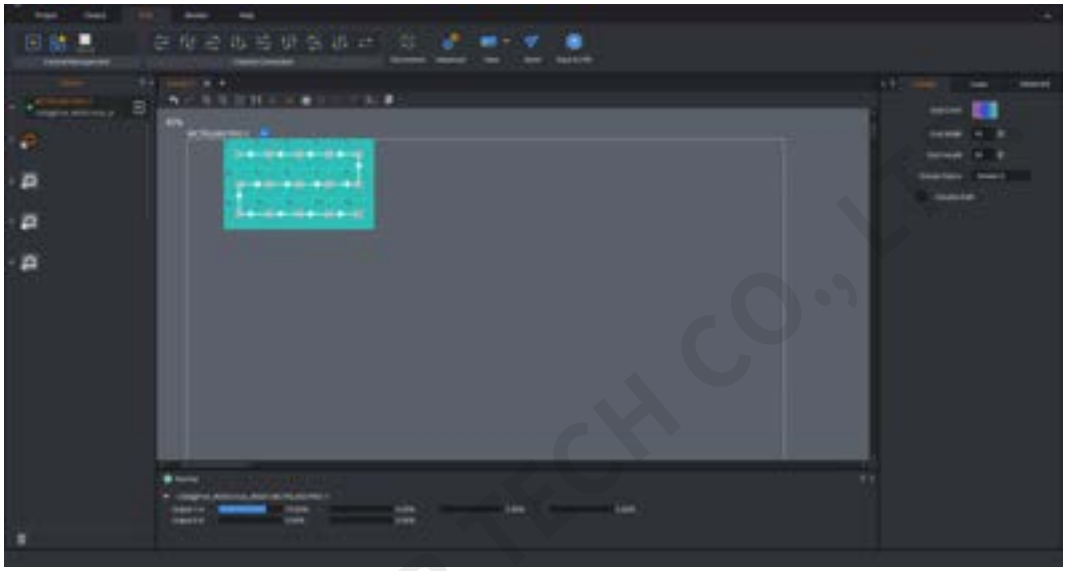
Figure 9-1 User interface of NovaLCT

XI'AN NOVASTAR TECH CO., LTD.

9.3.2 SmartLCT

Connect the MCTRL660 PRO to the control computer installed with SmartLCT V3.2.0 or later via USB cable to perform building-block cabinet configuration, seam brightness adjustment, real-time monitoring, hot backup, etc. For details on their operations, see *SmartLCT User Manual*.

Figure 9-2 User interface of SmartLCT



9.4 Firmware Update

9.4.1 NovaLCT

In NovaLCT, perform the following steps to update the MCTRL660 PRO firmware.

Step 1 Start NovaLCT and choose **User** > **Advanced Synchronous System User Login** and log in as an advanced user.

Step 2 Type the secret code "**admin**" to enter the program loading page.

Step 3 Click **Browse** to select the update program path and then click **Update**.

9.4.2 SmartLCT

In SmartLCT, perform the following steps to update the MCTRL660 PRO firmware.

Step 1 Start SmartLCT and enter the V-Sender page.

Step 2 In the properties area on the right, click to enter the **Firmware Upgrade** page.

Step 3 Click to select the update program path.

Step 4 Click **Update**.

XI'AN NOVASTAR TECH CO., LTD.

10 Specifications

Connector Type	Connector Name	Description
Input	DVI IN	• Single-link DVI connector • Custom resolutions supported: Maximum horizontal resolution: 3840×600@60Hz Maximum vertical resolution: 600×3840@60Hz • Supported standard resolutions: 1024×768@(24/30/48/50/60/72/75/85/100/120)Hz 1280×1024@(24/30/48/50/60/72/75/85)Hz 1366×768@(24/30/48/50/60/72/75/85/100)Hz 1440×900@(24/30/48/50/60/72/75/85)Hz 1600×1200@(24/30/48/50/60)Hz 1920×1080@(24/30/48/50/60)Hz 1920×1200@(24/30/48/50/60)Hz 2560×960@(24/30/48/50)Hz 2560×1600@(24/30)Hz
	HDMI IN	• HDMI 1.4a compliant • HDCP 1.4 compliant • Custom resolutions supported: Maximum horizontal resolution: 3840×600@60Hz Maximum vertical resolution: 600×3840@60Hz • Supported standard resolutions: 1024×768@(24/30/48/50/60/72/75/85/100/120)Hz 1280×1024@(24/30/48/50/60/72/75/85)Hz 1366×768@(24/30/48/50/60/72/75/85/100)Hz 1440×900@(24/30/48/50/60/72/75/85)Hz 1600×1200@(24/30/48/50/60)Hz 1920×1080@(24/30/48/50/60)Hz 1920×1200@(24/30/48/50/60)Hz

XI'AN NOVASTAR TECH CO., LTD.

		2560×960@(24/30/48/50)Hz 2560×1600@(24/30)Hz
	3G-SDI IN	• SMPTE ST 425-1 Level A & B, SMPTE ST 274, ST 296, ST 295 compliant • Maximum supported input resolution: 1920×1080@60Hz Note: 3G-SDI input sources do not support input resolution settings.
Output	RJ45 × 6	• 6 Gigabit Ethernet ports • Maximum loading capacity of a single output: 650 000 pixels • Support redundancy between Ethernet ports.
	OPT1 OPT2	• 10G optical ports – Single-mode twin-core fiber: Support LC optical connectors; wavelength: 1310 nm; transmission distance: 10 km; OS1/OS2 recommended. – Dual-mode twin-core fiber: Support LC optical connectors; wavelength: 850 nm; transmission distance: 300 m; OM3/OM4 recommended. • The maximum loading capacity of a single optical port equals to that of all the 6 Ethernet ports. • 2 OPT inputs/outputs – The OPT1 works as the primary input or output port, and the 6 Gigabit Ethernet ports work as the corresponding output or input ports. – The OPT2 works as the backup input or output port of OPT1. • In the sending card mode, both OPT ports and 6 Gigabit Ethernet ports can work as output ports to output the same image. • In the fiber converter mode, when the OPT ports work as the input ports, the 6 Gigabit Ethernet ports work as output ports. Or, when the 6 Gigabit Ethernet ports work as input ports, the OPT ports work as output ports.
	DVI LOOP	DVI loop output
	HDMI LOOP	HDMI loop output
	3G-SDI LOOP	SDI loop output
MONITOR	HDMI	Connect to a monitor to monitor the inputs. The monitor output resolution is 1920×1080@60Hz. If the input resolution exceeds the monitor resolution, the input will be automatically scaled in proportion and then displayed on the monitor starting from its top left.
Control	GENLOCK IN	GENLOCK input connector • Genlock type: Blackburst • Input Genlock sync signal to ensure synchronization and same refresh rate between the output signals of cascaded MCTRL660 PRO units and the external Genlock input signal.

XI'AN NOVASTAR TECH CO., LTD.

	GENLOCK LOOP	Genlock loop output connector. Up to 8 MCTRL660 PRO units can be cascaded.
	ETHERNET	Fast Ethernet port, which connects to PC and supports TCP/IP
	USB IN	Input port for cascading devices, or connecting to PC
	USB OUT	Output port for cascading devices. Up to 8 MCTRL660 PRO units can be cascaded.
Power	100 V –240 V AC	

Input voltage	100 V–240 V AC
Rated power consumption	20.0 W
Operating temperature	-20°C–60°C
Operating humidity	0% RH–90% RH, non-condensing
Dimensions	482.6 mm × 349.0 mm × 50.7 mm
Net weight	4.6 kg
Space requirement	1U
Packing	Carrying case: 550 mm × 440 mm × 175 mm, white cardboard box Packing box: 530 mm × 140 mm × 410 mm, craft paper box Accessory box: white cardboard box 1 × MCTRL660 PRO unit 1 × Ethernet cable (1.5 m) 1 × DVI cable (1.5 m, double magnetic ring design, EMC) 1 × USB cable (1.5 m) 1 × HDMI cable (1.5 m) 1 × Power cord

XI'AN NOVASTAR TECH CO., LTD.