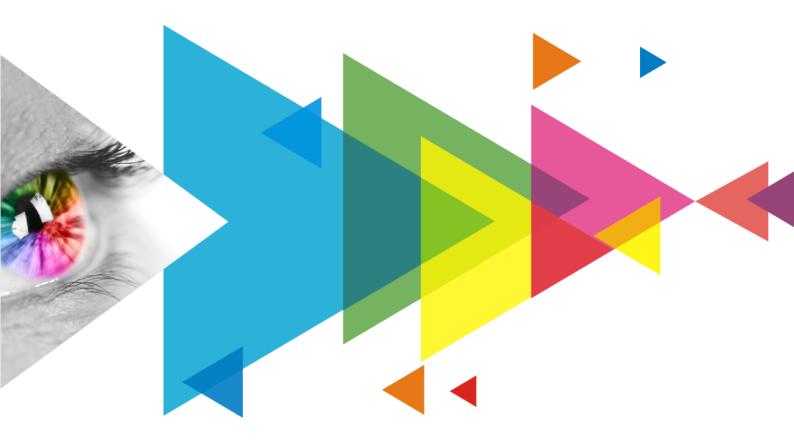


Cabinet Tool



User Manual

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1 Software Introduction

The Cabinet Tool is a configuration tool for the new-generation control system of Xi'an NovaStar. Tech Co., Ltd. It is mainly used for lighting up modules, configuring cabinets, burning programs, and managing calibration coefficients. Users can import the cabinet library file (.ncp) generated by this tool into VMP to quickly apply the configurations to the control system.

Note

The Cabinet Tool currently allows you to enable or disable calibration for managing calibration coefficients. The functionality for uploading, saving, reading back, and erasing calibration coefficients is still being debugged and refined.

2 Environment Setup

2.1 Software Installation

Prerequisites

- Obtain the installation package of Cabinet Tool.
- A computer running Windows 10 or a later system.

Installing Software

Double-click the installation file and follow the setup wizard. If a firewall prompt appears, choose allow to continue the installation.

Installation Result

If the installation is successful, the Cabinet Tool shortcut 🎉 appears on the desktop.

2.2 Software Authorization

The unauthorized version of Cabinet Tool only allows users to send NCP files, whereas the authorized version enables them to both send and save NCP files on the hardware.

Prerequisites

None

Procedure

Step 1 From the menu bar, select Authorize > License Management.

Figure 2-1 License management

License Management	\times
No license or the license expired	
Please import a license file	
 Copy the device code below and apply for a license file AEB38E80-BF08-11ED-AEE1-B7D3ED6F2F00 Import the license file to complete registration 	
File: 🛃 Import]
Verify	

Step 2 Click Copy and send the device code to NovaStar and apply for a license file.

Step 3 Click Import, and then select the license file and click Open.

Step 4 Click Verify

A prompt will be displayed after the authorization is successful.

2.3 Connect Devices

There are two ways to establish a connection between the Cabinet Tool on the control computer and the cabinets:

- Direct connection: Connect the control computer to the cabinets directly using an Ethernet cable.
 - Supported receiving cards: CA50E, CA50C, XA50.
- Connect to cabinets through a LED display controller: Connect the control computer to a controller using an Ethernet cable.

Supported controllers:

- COEX 5G devices: CX80 Pro, CX40 Pro, CY60.
- COEX 1G devices: MX6000 Pro, MX2000 Pro, MX40 Pro, MX30, MX20, KU20, KT60 Pro, SP60 Pro.
- M3 devices: MCTRL series, MSD300

There is no requirement for the receiving card model in this connection setup, as long as the controller supports the receiving card.

3 Main Functions

3.1 Device Management

		No devices	
Step 1	On the homepage, click	Selected:	
Otop i	on the noniopage, oner		•

Step 2 On the displayed **Device Management** screen, choose **Controller** or **Cabinet** based on the device connection.

Figure 3-1 Device Management

Device Management				×
Controller Cabinet Controller: 10.40.91.170:5200	✓ ○ Ref	Ma	pping: 📄 Rv Ca	ard Version: 🔵
Online Cabinets: 0 Selected 0 Individual	P Form	💼 Error Bit 💮	Detect F 🚺 🛨 Up	🗊 Re
No. Cabinet Location Cabinet Manufactor Cabinet Mod	lel Rv Card Model Firmware Version	Module Flash	Operation	5
	No data			
			Cancel	ОК

Step 3 Click Refresh.

Step 4 Select a controller or network card from the drop-down list.

After successfully connecting to the device, an icon (a) will appear next to the device name to indicate that it is connected. To end the connection, simply click **Disconnect**.

Devi	e Mar	nagement] 🔲 🙀 (@)16 (j	$\mathbb{D} \mid \mathbb{O} \mid <$			
• C	ontrolle	r 🔘 Cabinet	Controller	Rocky / 169.254.61.69	 O Re 	2 Di ?	Μ	lapping: 💽	Rv Card Version: 🤇
Onlir	ne Cabine	ets: 1 Selected	d 1 Individu	al		P For	🖶 Error Bi	⊕ Detect	U (⊜ Re
<	No.	Cabinet Locatic	Cabinet Man	ufactc Cabinet Model 🖓	Rv Card Model	Firmware Version	n Module Flash	Operation	<u>r</u>
•	1	P1-1	AC-ET	5251 3.0	A10s Pro	V1.2.2.17		Update L	ocate More
								Ca	oncel OK

Step 5 Select one or all of the cabinets from the cabinet list and do the following as required:

Copy the firmware program and configuration file •

Click Format Painter and wait for the readback is complete. Then, select other cabinets and click Start to let other cabinets share the same firmware and configuration file as the current cabinet.

. Error bit test

> Click Error Bit Test, and then perform manual error bit test, set up auto error test, and clear errors on the displayed window.

For cabinets with errors, you can view the error details and click Screen Display to pinpoint the error.

Error Bit T	est		◎16 (★) 🕢 <	×
Auto Ref	fresh 1 Min 🗘	Manual Refresh		Clear
TestStatus	SendingCard	Cabinet Location ErrBitDet	ail Screenf	Position Clear
	Rocky	P1-1	Scree	n Clear
Normal	• Error code	• Read data error • Not support	ted	

Figure 3-2 Connect to devices



Detect flash

Click **Detect Flash.** If the module has flash memory, you can click the test result and view the details on the pop-up window.

• Update firmware

Click Update and then select a receiving card program file on the pop-up window and click OK.

If the program file you need is not listed, you can click **Import** to import the program file (.image) into the Cabinet Tool.

					Import
	No. ‡	Program Name 🖓	Program Type 🖓	Device Model 🖓	Version 🖓 🖆
/	1	Data_A10s Pro_V1.1.2.33	Rv Card Program	A10s Pro	1.2.1.3
	2	DATA_A10s Pro_V1.1.2.33_0715.T1	Rv Card Program	A10s Pro	1.1.2.33
	3	DATA_A10s Pro_V1.1.2.78-1103	Rv Card Program	A10sPro	1.1.2.78
	4	Data_A10s Pro_V1.1.4.31	Rv Card Program	A10s Pro	1.1.4.1d
	5	DATA_A10s Pro_V1.1.4.8.T11.5264	Rv Card Program	A10s Pro	1.1.4.8
	6	DATA_A10s Pro_V1.1.4.9.T12-2055	Rv Card Program	A10s Pro	1.1.4.9
	7	Data_A10s Pro_V1.1.6.0	Rv Card Program	A10s Pro	1.1.6.0
	8	Data_A10s Pro_V1.2.1.3	Rv Card Program	A10s Pro	1.2.1.3
	9	DATA_CA50_V1.2.0.22_20230523_update	Rv Card Program	CA50	1.2.0.22
	10	Data_XA10-A_V1.1.4.6	Rv Card Program	XA10-A	1.1.4.6

Restart cabinet

Click Restart or click More and then click Restart on the pop-up menu.

Locate cabinet

Click Locate to see the cabinet's position on the screen.

Upload configuration file

Click **More** and then choose **Upload Configuration File** on the pop-up menu. Select a cabinet configuration file (.rcfgx) on the pop-up window and click **Open**.

Upload image quality file

Click **More** and then choose **Upload Image Quality File** on the pop-up menu. Select an image quality file (.vglcx) on the pop-up window and click **Open**.

Enabling Mapping

Enable the **Mapping** function by toggling on this switch to

• View MCU and FPGA version

Hover the mouse over the 🕐 next to the **Firmware Version** column, or set the **Receiving Card Version** to .

3.2 Module Design

3.2.1 Add Module

Prerequisites

Obtain the specifications of the modules.

Procedure

Step 1 On the homepage, click Module.

Figure 3-3 Mod	dule																
Selected:		ii dule		binet	- Burn	Calibrati		© braries		O Blac			Normal 🗸 DOHz 🗸	Brightness Gamma	0		100 % 🗘 2.4 🔿
Module File List												+Add Module	≓Move	± Import	±.E	xport	🗊 Delete
Q. Search Folder	+		No. 🗄	Module Nar	ne	RES	Drive Mode	Decoder 🖓	Data Type ∑	Data Gro	Scans	Status 🖓	Modified ‡		Operati	on	5
Folder			1	Module202	30704110706	128x16	ICND2065	74HC138 decod	Parallel drive	2	8	Completec	2023-07-04	4 11:07:37	Edit	View	Сору
			2	Module202	30711110956	128x16	ICND2065	74HC138 decod	Parallel drive	2	8	Completec	2023-07-1	1 11:10:17	Edit	View	Сору
			3	Light202307	11150227	128x16	ICND2065	Decode5958	Parallel drive	2	8	Completec	2023-07-1	1 15:03:15	Edit	View	Сору
		In To	otal 3 Ite	ms, Find 3 Ite	ms								<	1 >		5 tems /	Page ∨

Step 2 On the left side of the screen, select a folder to store the new modules.

The folder is used for organizing and managing modules. You can search folders by name (case sensitive) or click to add new folders.

The right-click menu operations are as follows:

- Add: Add a sub-folder or a new folder either above or below the selected folder.
- Move: Move up or down the selected folder.
- Level: Level up or down the selected folder.
- Rename: Rename the selected folder.
- Delete: Delete the selected folder.

You can also drag to adjust the position and level of a folder.

Step 3 Click Add Module.

Step 4 Enter a module name on the Basic Info screen.

Figure 3-4 Basic information

Basic Info 2 Topology 3 Crop Module	
Moduleinfo	
* Module Name: Module20240116160822	
* Driver Chip: ICND2065 Select ChipType Decoder: 74HC138 decoder	* Data Type Parallel drive 🗸
TVirtual Mode Settings RGB Order, R V G V B V	
Module Description:	
Author: Unknown	
	Next 🛛 🖓 Save

Step 5 Set relevant parameters based on the module specifications.

- Driver Chip: Select the type of driver chip. You can enter a chip type directly or select from the drop-down list. You can also click **Select Chip Type** and then select from the pop-up window.
- Decoder: the decoder chip type.
- Data Type: the output format of RGB data.
- Virtual Mode: For modules with shared pixels (sub-pixels), complete the settings including RGB layout, color and range based on the pixel design.
- RGB Order: the RGB order of the pixels.
- Step 6 Once the basic information of the module is all filled out, click Next.
- Step 7 On the Topology screen, set the relevant parameters including Width, Height, Data Groups, Scans, Drawing Mode, and Single-Color Driver Chips per Group based on the module specifications.

Wid	th: [128		^	Hei	ght:	16			Data	Grou	ups:	2	_) s	cans:	8		\$	Dra	wing	Mode	e: 💿	Norr	nal	Ac	lvance	ed	Singl	e-Co	lor Dr	iver (Chips	per G	roup:	8		$\hat{}$					
	\$		Aut	o Ger	erat		nsert	в	lank	Pixels	: 1		\$	C	rawn	Pixel	s:0	Insert	ed Bl	ank P	ixels:	0 То	otal:0		Left	Drive	IC Pi	ns:20	48													Re	ese
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	ľ
F																																											
1																																											
Ŀ																																											
Ľ																																											
r																																											
r																																											
t																																											
t																																											
t																																											
-																																											

Figure 3-5 Topology

About Drawing Mode:

- Normal: Same pixel topology for different scans.
- Advanced: Any pixel position drawing.

The formula for calculating **Single-Color Driver Chips per Group** is as below. When it cannot be divided exactly, any unused channels can be inserted with blank pixels.

Single-Color Driver Chips per Group = Pixels per scan / Chip channels

- Step 8 Click on the grids in the topology one by one to draw the pixels. When drawing adjacent pixels, you can use the arrow keys on the keyboard.
 - 🥱: Undo.
 - Redo.
 - Auto Generate: Complete pixel position drawing for the first row of pixels quickly.
 - Insert: Insert blank Pixels.

Input a value for **Blank Pixels** and each time you click **Insert**, blank pixels equal to the value will be inserted at the current position. For example, if you set the **Blank Pixels** to 2, clicking **Insert** 3 times will insert a total of 6 blank pixels at the current position.

- **Reset**: Reset the module topology.
- Step 9 Once the pixel drawing is complete, do the following as required.
 - Save Module: Click Save.
 - Crop Module: Click Next to continue to Step 10
- Step 10 Select Extract Row and click on the rows that need to be cropped, or select Extract Column and click on the columns that need to be cropped, or select Crop and click on the pixels that need to be cropped. Finally, click Crop.

Related Operations:

- Restore Pixels: Select the cropped pixels and click **Restore**.
- Reset Row, Column, or Pixel: Select Extract row, Extract column or Crop, and then click Reset.
- Step 11 Once the cropping is complete, click **Save**.

The file will be displayed in the Module File List after clicking Save.

3.2.2 Manage Module

On the homepage, click Module to display the Module File List screen.

	Dedule	Calibration	Ø Blackout Screet & Freeze Frame Rain		100 % ‡ 2.4
Module File List			Add M	lodule	📩 Export 🗊 Delete
Q Search Folder	No. 🕴 Module Name 🖓	RES Drive Mode Decoder	Data Type 🗧 Data Groi Scans 🍸 🦳 Si	tatus 🍸 🛛 Modified 🕴	Operation 🗠
	1 Module2023070411070	6 128x16 ICND2065 74HC138 decod	Parallel drive 2 8 C	ompletec 2023-07-04 11:07:37	Edit View Copy
Folder	2 Module2023071111095	6 128x16 ICND2065 74HC138 decod	Parallel drive 2 8 C	ompletec 2023-07-11 11:10:17	Edit View Copy
	3 Light20230711150227	128x16 ICND2065 Decode5958	Parallel drive 2 8 C	ompletec 2023-07-11 15:03:15	Edit View Copy
	In Total 3 Items, Find 3 Items			< 1 >	15Items /Page ∨

Figure 3-6 Module File List

Do the following as required:

Move Module

Select one or more modules and click **Move**. On the pop-up window, select how to move the module, and then click **OK**.

Move		×
Selected Folders: 1		
Method: Cut 	○ Сору	
Move To:		~
		Cancel OK

Import module

Click Import, select a module file, and then click Open.

Export module

Select one or more modules and click **Export**. Then, select a file path and click **Save**.

Delete Module

Select one or more modules and click Delete. On the prompt window, click OK.

Edit module

Click Edit or double-click to change the module setup. Once complete, click Save.

View module

Click View to see the module details on the pop-up window.

• Copy module

Click Copy and enter a new module name, and then click OK.

3.3 Cabinet Design

3.3.1 Add Cabinet

On the homepage, click **Cabinet**. Then, select a folder for storing new cabinets and click **Add Cabinet** and set relevant parameters on the following tabs: 1. Cabinet Info; 2. Construction; 3. Display Mode; 4. Correct Cabinets; 5. Thermal Compensation; 6. Configuration.

Once the cabinet is configured, click the button at the bottom-right corner to save and send the configuration to the receiving card.

The file will be displayed in the Cabinet Files after clicking save.

1.Cabinet Ir 2.Constructiv 3.D	Display Mc 4.Correct Ca	5. Thermal c 6.Conf	igurat					
Cabinet Properties								
* Manufacturer:	✓ ChooseMan	abinet Model: NewC	abinet1d139bd5	Cabinet Rep	ort:	Brows	Delete Downk	
Pixel Pitch: 1	mm 🗘	Width: 500	mm 🗘	Height: 500	mm 🗘	Weight: 15	kg 🗘 Power Cons 200	w 🗘
Cabinet Description:					Aut	hor:		
Bind Program Cabinet Code								
* Program:			✓ Select	± Import				
Select the manufacturer and p	rogram before entering t	he next step						
							Send 🗟 Save Rv-card Co	onfig 🕒 Save

3.3.1.1 Cabinet Info

Prerequisites

Obtain the specifications of the cabinet before continuing with the operation.

Procedure

Step 1 Fill out relevant parameters under the Cabinet Properties based on the cabinet specifications.

There are no restrictions on the file format for the cabinet report, and you can upload, download or delete reports as needed.

Figure 3-8 Cabinet properties

Cabinet Properties								
* Manufacturer:	✓ ChooseMan	abinet Model: Nev	vCabinet1d139bd5	Cabinet Rep	ort:	Browse	Delete Downk	
Pixel Pitch: 1	mm 🗘	Width: 500	mm 🗘	Height: 500	mm 🗘	Weight: 15	kg 🗘 Power Cons 200	w C
Cabinet Description:						Author:		

Step 2 On the **Bind Program** tab, select a program from the drop-down list. If there is no program you want from the dropdown list, you can click **Select** to download a program from the cloud to your computer and then click **Use**. Or, you can also click **Import** and then select a program file on the pop-up window and click **Open**.

The program information including basic information, functions, and driver IC will be listed below.

Figure 3-9 Bind program

Bind	I Program Cabinet Code	
	* Program: DATA_A10s Pro_V1.1.48.T11.5264	
В	asic Info Functions Driver IC	
	Program Name: DATA_A10s Pro_V1.1.4.8.T11.5264	
	Program Type: Rv Card Program	
	Device Model: A10s Pro	
	Program Versio1.1.4.8	
	Program Descri	

Step 3 Select the Cabinet Code tab.

Step 4 Click **New Cabinet Code**, enter a cabinet SN on the pop-up window, and then click **OK**. www.novastar.tech

The cabinet code must be unique and does not accept any duplicate values. Additionally, you have the option to import, edit, or delete cabinet codes.

3.3.1.2 Construction

Step 1 Under the Module Library tab, select a module folder from the drop-down list on the left.

To import modules, please click **Import** > select the module file (.modules/.module2/.module) you want on the pop-up window > click **Open**.

- Step 2 Set the number of rows and columns of the module.
- Step 3 Hover the mouse over a module under the module list to view the detailed information and drag the module you want to the editing area.

For example, if **Rows** and **Cols** are both set to 3, dragging a module to the editing area will add the same module of 3 rows and 3 columns.

When there are multiple modules under the module list, you can search for the module you want by keywords.

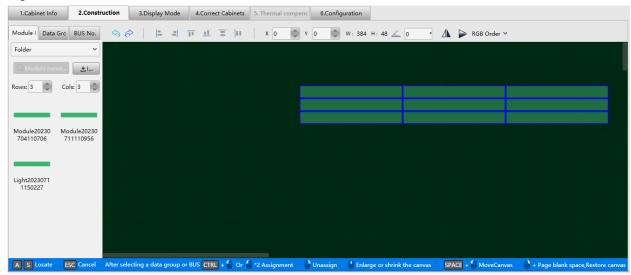


Figure 3-10 Construction

Step 4 Select a module and do the following as required to adjust the configuration.

• View Module Details

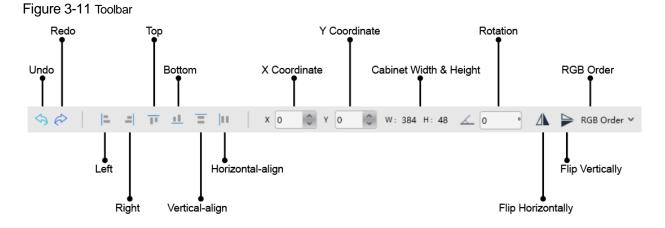
Right-click on the module and select **Details** from the pop-up menu. Then, you can check the detailed information on the pop-up window.

- Crop Module
 - a. Right-click on the module and select Crop from the pop-up menu.
 - b. On the pop-up window, select **Extract Row** and click on the rows that need to be cropped, or select **Extract Column** and click on the columns that need to be cropped, or select **Crop** and click on the pixels that need to be cropped. Finally, click **Crop**.
 - c. Once the cropping is complete, click **Save** to close the window. If **Sync to module file list** is selected when saving the change, the cropped module will be saved to Module Library.
- Copy Module
 - Press Ctrl+C and Ctrl+V.
 - Right-click on the module, select Copy from the pop-up menu, and then press Ctrl+V.
- Delete Module
 - Press Delete.
 - Right-click on the module and select **Delete** from the pop-up menu.
- Sync to Module Library

Right-click on the module and select **Sync to Module Library** from the pop-up menu. Enter a new module name on the pop-up window and click **OK** to save the module to Module Library.



- Module Alignment
 Click the alignment buttons.
- Move Module
 Drag the module or input X and Y coordinates.
- Rotate Module
 Input a rotation angle and press Enter or click on other positions on the screen.
- Flip Module
 Click the flip buttons.
- Adjust RGB Order
 Click **RGB Order** and set the RGB order of the pixels on the pop-up box.



Step 5 Select the Data Group tab, set the start data group, and then select or deselect Cascade.

• When Cascade is selected, you can assign the same two data groups to each module.

	(1,2)	(1,3)
(2,1)	(2,2)	(2,3)

• When **Cascade** is not selected, you can assign two data groups to each module in sequence according to the data group number.

(1,1)	(3,1)	(<u>5,1</u>)
(2,1)	(4,1)	<mark>(6,1)</mark>

Step 6 Hold down the Ctrl key and left-click, or simply double-click, on modules to assign a data group for the module.

Tip: You can also hold down the **Ctrl** key and drag the left mouse button over multiple modules to quickly add data groups.

- Step 7 Depending on whether the module has flash memory, you can do the following to set the flash memory arrangement of the cabinet.
 - Yes, the module has flash memory: Proceed to Step 8.
 - No, the module has no flash memory: No further action needed.
- Step 8 Select the **Bus No.** tab, set the start bus, and then select or deselect **Cascade**.
- Step 9 Hold down the Ctrl key and left-click, or simply double-click, on modules to assign a bus no. for the module.
- Step 10 To access more flexible settings, enable Advanced (C) and fill out the required parameters.



Figure 3-12 Advanced Mode

Advanced:	
Rows: 2	Cols: 2
Width:	0
Height:	0
Data Groups:	2
Start X:	0
Start Y:	0 0

3.3.1.3 Display Mode

Step 1 Select an existing mode or click to add a new mode.

All configuration parameters for the 3. Display Mode and 4. Correct Cabinets tabs are included in the mode.

- Send all configuration parameters for the current mode to the receiving card.
- Edit the current mode's name.
- Delete the current mode.

Figure 3-13 Display Mode

lode: (1/1) Mode1	▼	2			V3: Multiple Frame Rate Rang
Global Parameters Max DCLK Frequency:	12.3136 MHz Min DCLK Frequency: 9.31	36 MHz DCLK Dut	ty Cycle: 50 % 🗘	DCLK Phase: 10 ns	Black Field Time: 80 us
Max GCLK Frequency: 7			cal Fram79.2 Hz	Actual Brightness Effic89.3605 %	
rame Rate Presets					Send Export Frame Rate Report
23-60 Hz	Receiving Card Parameters				
		✓ Refresh Rate: 1	920	Grayscale Level: 12	Brightness Efficiency: 89.3605 %
+ 9 2 0	Row Blanking Time: 1000 ns	C Afterglow Control End9	000 ns 🗘 Line	e Changing Time: 300 ns 🗘	Current GCLK Frequenc 1.1001 Mhz
	Driver Chip Parameters				Send driver IC parameters in real-time
	Driver Chip Parameters R Chip	G Chip	B Chip	No. R Chip G Chip B Chip Virtu	
		G Chip	B Chip		alRe
	R Chip			1 0x0055 0x0055 0x0055 0x0	alRe
	R Chip ⑦ Ghost Elimination 29 ⑦ Ghost Elimination 1	0 25 0 1 0 0	23	1 0x0055 0x0055 0x0055 0x0 2 0x0155 0x0155 0x0155 0x0	alRe 1000
	R Chip (7) Ghost Elimination 29 (7) Ghost Elimination 1 (7) Low-Grayscale Uni 2	○ 25 ○ ○ 1 ○ ○ Enhanced Mod	23 0	1 0x0055 0x0055 0x0055 0x0055 2 0x0155 0x0155 0x0155 0x0155 3 0x0207 0x0207 0x0207 0x0207	000 000
	R Chip C Ghost Elimination [29 C Ghost Elimination 1 C Low-Grayscale Uni 2 C Low-Grayscale Firs 8	25 0 1 0 Enhanced Mod 1	23	1 0x0055 0x0055 0x0055 0x0 2 0x0155 0x0155 0x0155 0x0 3 0x0207 0x0207 0x0207 0x0	alRe 1000 1000
	R Chip (7) Ghost Elimination 29 (7) Ghost Elimination 1 (7) Low-Grayscale Uni 2	○ 25 ○ ○ 1 ○ ○ Enhanced Mod	23 0	1 0x0055 0x0055 0x0055 0x0055 2 0x0155 0x0155 0x0155 0x0155 3 0x0207 0x0207 0x0207 0x0207	alRe 000 000 000

Step 2 On the top right of the screen, select the Frame Rate Adaptive version from the drop-down list.

Step 3 If the driver chip supports Frame Rate Adaptive V3, set the frame rate. Otherwise, skip this step.

- Add frame rate: Click 🖃.
- Copy frame rate: Select a frame rate and click 😐.
- Edit frame rate: Select a frame rate and click
- Delete frame rate: Select a frame rate and click
- Export frame rate report: Select a frame rate and click Export Frame Rate Report.
- Step 4 Set receiving card parameters.

The parameters vary depending on the driver IC.

Figure 3-14 Receiving card parameters

Receiving Card Parameters											
Refresh Rate Times:	16	•	Refresh Rate: 1	920	Grayscale Level: 1	12	Brightness Efficiency: 89.3605	%			
Row Blanking Time:	1000 r	ns 🗘	Afterglow Control End9	900 ns 🗘	Line Changing Time:	300 ns 🗘	Current GCLK Frequenc 1.1001	Mhz 🔇			

- Refresh Rate: Indicates the rate of updating the image on the display. Increasing refresh rate reduces image flickering, allowing for a more stable image.
- Refresh Rate Times: Indicates the times of refresh rate.
- Grayscale Level: Indicates the shades of gray on the screen. The greater the grayscale level, the more shades
 of gray that can be displayed on the screen. For example, if the grayscale level is set to 16 bits, the screen can
 display up to 65536 shades of gray.
- Brightness Efficiency: It is calculated from other performance parameters.
- GCLK Frequency: Indicates the frequency of grayscale clock.
- Frequency Divider: Frequency division coefficient.
- DCLK Phase: Indicates the phase of shift clock. When there are mismatching or flashing pixels, adjust this
 parameter to fix the problem.
- DCLK Duty Cycle: Indicates the duty cycle of shift clock. Set it to 50% in general.
- DCLK Frequency: Indicates the frequency of shift clock.
- Row Blanking Time: Used to adjust the ghost problem of the scanning type display. If the ghost problem is serious, increase the parameter value.
- Afterglow Control Ending Time: Works with row blanking time and line changing time to adjust the ghost of the scanning type display.
- Line Changing Time: Works with row blanking time to adjust the ghost of the scanning type display.

Step 5 Set driver chip parameters. If the driver chip supports Frame Rate Adaptive V3, toggling on **Send driver IC parameters in real-time** to • will send parameter adjustments to the receiving card in real time.

- Current Gain: Color temperature parameters for the modules. Select **Linked** to set the current gain of red, green and blue to the same value. Deselect **Linked** to adjust the current gain of red, green and blue separately.
- Cross Elimination Settings: Select **Enable** and click **Eliminate Cross** to remove dead pixels.

The hexadecimal values of the RGB driver chip registers are displayed in a table. After selecting a value, the corresponding 16-bit binary value will be displayed on the right. Select any value to set it to 1; deselect to set it to 0. To adjust the register value, double-click on the value in the table or check/uncheck the checkbox.

Figure 3-15 Driver Chip Register

_													
N	lo.	R Chip	G Chip	B Chip	VirtualRe	F	E	D	c	B	A	9 マ	8
	1	0x0055	0x0055	0x0055	0x0000	7	6	5	4	3	2	1	0
1	2	0x0155	0x0155	0x0155	0x0000		_					_	
:	3	0x0207	0x0207	0x0207	0x0000								
	4	0x031F	0x031F	0x031F	0x0000								
	5	0x0408	0x0408	0x0408	0x0000								
	6	0x0507	0x0507	0x0507	0x0000								
•	7	0x0601	0x0601	0x0601	0x0000								
	8	0x0720	0x0720	0x0720	0x0000								
2	9	0x0820	0x0820	0x0820	0x0000								

- Step 6 Set decoding chip parameters.
- Step 7 Click Send on the top right of the screen if you want to send the parameters to the receiving card. Otherwise, skip this step.



3.3.1.4 Correct Cabinets

To import image quality files (.nrf/.vglcx), click end next to the frame rate on the left of the screen and then select **Import** from the pop-up menu. Select an image quality file on the pop-up window and click **Open**. If you do not have any image quality files, do the followings:

Note

When collecting the display data, if you select the auto or custom collection method, a CA410-VP427, CA410-P427, or CA410-P427H (when brightness is over 3,000 nits) colorimeter should be used and the device connection must be completed; no colorimeter is required for manual collection.

Step 1 Select mode and frame rate on the left of the screen.

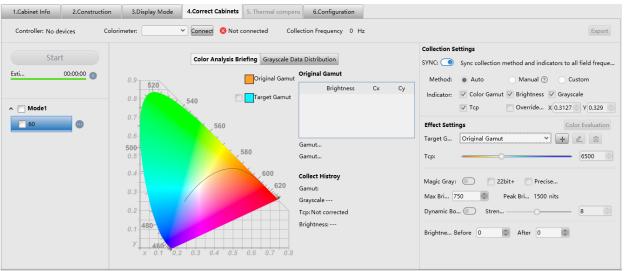


Figure 3-16 Cabinet Correction

- Step 2 If you want all frame rates to use the same collection method and indicators, set Sync collection method and indicators to all field frequencies to enabled (...). Otherwise, please set it to disabled.
- Step 3 Do the following according to the collection method of the display data.
 - Automatic
 - a. Set the collection method to Auto.
 - b. Select a colorimeter model from the drop-down list.

When the hardware connection is normal, the Cabinet Tool will automatically establish communication with the colorimeter after selecting a model.

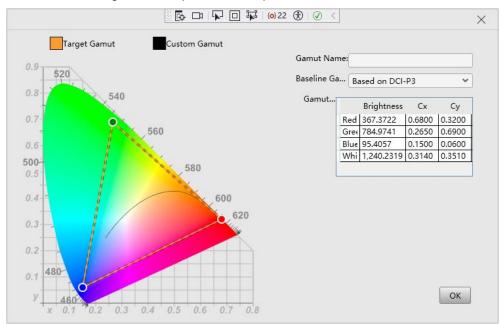
- c. Click Start to automatically collect the relevant display data through the colorimeter.
- Manual
 - a. Set the collection method to Manual.
 - b. Select **Gamut**, manually collect the relevant display data, and then double-click the value in the table and modify it.
 - c. Select Brightness and then set the brightness before and after calibration.
 - d. Click Start to apply the color gamut and brightness data.
- Custom
 - a. Set the collection method to Custom.
 - b. Set the collection indicators.
 - c. Click Start to automatically collect the relevant display data through the colorimeter.
- Step 4 Under the Effect Settings, set the following parameters and view the effect on the screen.
 - Target Gamut



Select a target gamut from the drop-down list. To view the target gamut in the color gamut diagram, select **Target Gamut**.

Do the following to add custom gamut.

a. Click in on the right of the drop-down list to open the Add Custom Gamut window.



- b. Enter a custom gamut name.
- c. Select a baseline gamut from the drop-down list.
- d. Double-click the cells in the table to change the gamut values or drag the vertex of the black triangle in the color gamut diagram to modify it.
- e. Click OK once you are done.

Select a custom gamut and then click is to edit it, or click is to delete it.

Color Temperature

Drag the slider to set the color temperature, or set the value in the entry box.

Magic Gray

Toggle switch to enable/disable this function. When this is enabled, **22bit+** and **Precise Grayscale** can be selected.

Max Brightness

Set the max brightness of the screen in the entry box. **Peak Brightness** is the max brightness measured by the colorimeter.

Dynamic Booster

Toggle switch to enable/disable this function. When this is enabled, drag the slider to adjust the intensity of the Dynamic Booster.

Brightness

Set the brightness before and after calibration to adjust the effect.

Step 5 Click with the frame rate and then select **Export** from the pop-up menu to save the configuration into a file.

Select Clear if you want to remove all image quality configurations.

- Step 6 If you want to evaluate the color precision, do the following.
 - 1. Click Color Evaluation.

Evaluate Colo	r Precision						\times
Evaluate Color:	Export Report		🗍 Display Demo	Switching I	nterval 1 s	Start Demo	Stop
						Start Denio	Stop
Standard Color	Color Value	CIE31(Lxy)	sured Value Before MGMT	DeltaE	Measured Value (Lxy)	DeltaE	
	#745244			0		0	
	#D9792F			0		0	1
	#2E3E95			0		0	
	#F9F3ED			0		0	1
	#C49582			0		0	1
	#455CA3			0		0	1
	#45924A			0		0	
	#C8C8C7			0		0	1
	#5C799B			0		0	1
	#B12D38			0		0	1
	#5B6B45			0		0	1
	#5A3D67			0		0	1
	#EBC32F			0		0	1
	#777978			0		0	1
	#827FAC			0		0	1
	#9DB848			0		0	1
	#BD5290			0		0	1
	#535454			0		0	1
	#5DBAA8			0		0	
	#E39E34			0		0	7
	#0083A2			0		0	1
	#363637			0		0	1

- 2. On the Evaluate Color Precision screen, select a gamut from the drop-down list and click Start Evaluation.
- 3. Select Display Demo.
- 4. Click any of the colors in the table and check their effect on the LED screen. Or, you can set the auto color switching interval and then click **Start Demo** to check the effects of all colors on the screen.
 - CIE31: The standard value of brightness, Cx and Cy of the color.
 - Measured Value Before MGMT: The measured value of brightness, Cx and Cy of the color in the original color gamut.
 - Measured Value: The measured value of brightness, Cx and Cy of the color in the target color gamut
 - DeltaE: The deviation between the measured value and standard value.
- 5. Deselect **Display Demo**, click **Export Report** to save the evaluation result into a file.

3.3.1.5 Thermal Compensation

Prerequisites

- The cabinet layout is 3x3.
- You already have a thermal compensation file (.cofe).
- The colorimeter (model CA-410 or CS-150) and thermometer (model OPTCSLT 15SF CB1) are connected.

Procedure

Step 1 Do the following on the Environment interface and then click Next.

1.Cabinet Info	2.Construction 3.Dis	isplay Mode 4.Correct Cabinets	5. Thermal compen	5.Configuration		
Adjustment Method	Auto Manual	1 Environment	2 Cold Screen (3	Temperature 4 Warm Screet 5 Parameter G		
Colorimeter:	Connect S Not o	connected Thermometer:	♥ Connect	•		
2 2 1 Point the colorime	4 9 5 8 6 7 eter and thermometer in the	Mapping: O	1 N Z Z	Check whether the following settings of the conn Brightness 100% Enabled: Calibration (Except Thermal) Enabled: Precise Grayscale Enabled: Xbit Closed: Color Management Closed: Thermal Compensation Detect	ected cabinets are met.	Next
					∜Send Save Rv-card Config	Save

Figure 3-17 Environment

1. Select a colorimeter and a thermometer from the drop-down lists.

If the colorimeter and thermometer are properly connected, the software will automatically establish communication with them after selecting from the drop-down lists.

2. Select a cabinet layout based on the LED screen's actual topology.

To display the cabinet layout on the LED screen, simply set the **Mapping** setting to enabled (...).

- 3. Click **Detect** to check if the cabinet settings meet the requirements. If they do not, take appropriate action accordingly.
- Step 2 Do the following on the Cold Screen Collection interface and then click Next.

1.Cabinet Info	2.Construction	3.Display Mode	4.Correct Cabir	nets 5. Thermal com	pen 6.Config	juration						
Adjustment Method	: 🌒 Auto 🔵 Manual		1 Environm	ent 2 Cold Screer	C 3 Tempe	erature	4 Warm Screer 5	Parameter (Ĵ			
Colorimeter:	✓ Connect	O Thermometer		✓ Connect ⊗								
	255Green											
	\odot		Room T 25.7	℃ Collect Keep	the thermomete	r at least o	ne meter away from the	screen.				
255Red		255Blue	Color	Brightness	Temperature	Action						
\odot		\odot	Red 16	8.5602 Lv(cd/m²)	34.7 ℃	Collect						
			Green 36	3.5512 Lv(cd/m²)	36.1 ℃	Collect						
			Blue 56.	.44012 Lv(cd/m²)	29.6 ℃	Collect						
Point the colorime	eter and thermometer	in the corr										
										Ва	ck	
									∜ Send	Save Rv-card Config		a

Figure 3-18 Cold screen collection

- 1. Place the thermometer at least 1 meter away from the LED screen and then click **Collect** to start collecting the room temperature data.
- 2. Place the thermometer and colorimeter tightly close to the cabinet displaying red and then click **Collect** to start collecting the cabinet brightness and temperature data.
- 3. Repeat the above to collect the brightness and temperature data of the cabinets displaying green and blue.

Step 3 Do the following on the Temperature Rise Collection interface and then click Next.



Figure 3-19 Temperature rise collection

- 1. Place the thermometer and colorimeter tightly close to the cabinet displaying white and then click **Continuous Collect**.
- 2. Ensure a continuous data collection of no less than 30 minutes, until the data curve reaches a stable state.
- 3. Click **Stop** once the process is completed.

Step 4 Do the following on the Warm Screen Collection interface and then click Next.

1.Cabinet Info	2.Construction	3.Display Mode	4.Correct Cabinets	5. Thermal comp	en 6.Config	uration				
Adjustment Method	l: 🌒 Auto 🔵 Manua	al	1 Environment	2 Cold Screen	3 Tempe	rature	4 Warm Screei 5 Parameter	G		
Colorimeter:	✓ Connect	8 Thermomet	er:	✓ Connect ⊗						
	255Green		Room T 26.2	C Collect Keep t	he thermomete	at least o	ine meter away from the screen.			
255Red	255White	255Blue	Color	Brightness	Temperature	Action				
\odot		\odot	Red 221.82	55 Lv(cd/m²)	45.4 ℃	Collect				
			Green 541.51	7 Lv(cd/m²)	50 ℃	Collect				
	0Grayscale		Blue 78.123	09 Lv(cd/m²)	36.1 ℃	Collect				
	\odot		Black 0.0026	278 Lv(cd/m²)	27.1 ℃	Collect				
Point the colorim	eter and thermomete	er in the corr								
									Back	Next
								⁄∜ Send	Save Rv-card Config	🖹 Save

Figure 3-20 Warm screen collection

- 1. Place the thermometer at least 1 meter away from the LED screen and then click **Collect** to start collecting the room temperature data.
- 2. Place the thermometer and colorimeter tightly close to the cabinet displaying red and then click **Collect** to start collecting the cabinet brightness and temperature data.
- 3. Repeat the above to collect the brightness and temperature data of the cabinets displaying green, blue, and black.



Figure 3-21 Parameter generation

1.Cabinet Info	2.Construction	3.Display Mode	4.Correct Cabinets	5. Thermal compen	6.Configuration	1		
Adjustment Method	: • Auto 🔿 Manual		1 Environment	2 Cold Screen (3 Temperature	4 Warm Screer 5 Parameter G		
Colorimeter:	✓ Connect (8 Thermometer	:	✓ Connect ⊗				
Thermal Compensa Adjustmer Ge	ation File: Standard.zip enerate 🗸	o.cofe		Browse				
Automatic Mo	ode: 💿 Image Adapta	ition 🔵 Cabinet Sens	or Automatically ad	just according to the d	isplayed content.			
Thermal Comp	pensation: 💿 On 🤇	Off						
Adjustment M	lethod: Manual Y	Manual Adj	— — — — — — — — — — — — — — — — — — —		14 🔘	The factory setting is in manual mode. Please set t	he default values to 0.	
Send Save	Erase							
								Back
						∜ Ser	d 🕞 Save Rv-card Config	Save

- 1. Click Browse to select thermal compensation file from the pop-up window. Then, click Open.
- 2. Click **Generate** to generate the adjustment file by combining the collected data with the thermal compensation file.
- 3. Select the automatic adjustment mode, which is to adjust automatically according to the display content or the cabinet temperature sensor.
- 4. Turn on or off thermal compensation.
- 5. Set the adjustment mode to **Manual** or **Auto**. After selecting **Manual**, you can set the **Manual Adjustment** to enabled () and adjust the adjustment strength.
- 6. After setting is completed, click Send to send the thermal compensation parameters to the receiving cards.
- Click Save Rv-card Config to save the thermal compensation parameters in the receiving card.
 If you want to erase the thermal compensation parameters in the receiving card, click Erase.

3.3.1.6 Configuration

Figure 3-22 Configuration

1.Cabinet Info	2.Construction	3.Display Mode	4.Correct Cabinets	5. Thermal compens	6.Configuration
Function Swil No Video Sig Cabinet LCD: Light Up Slo (Afterglow Co (Low Latency: (Cabinet Moni Fans Power Su Power Su Humidity	CabinetPre-Sto v Ethe nothing v Ethe Ca After After pply ture	ernet Disconnec (Cabi MC Optimization: Closs abinet Indicator: rglow Control P	e v		Calibration Switches Brightness Brightness Image: Construction Image: Construction Coefficients: R: 0.919 G: 0.919 B: 0.919 VR: 0.919 VR:
					Coming Soon
					ସ Send ☐ Save Rv-card Config ☐ Save

Set the following parameters based on your needs:

- Function Switches
 - No Video Signal: The displayed image of the cabinets when there is no video source signal.
 - Ethernet Disconnected: The displayed image of the cabinets when the Ethernet is disconnected.

- Cabinet LCD: Enable/Disable cabinet LCD backlight.
- EMC Optimization: Set the intensity of EMC optimization.
- Light Up Slowly: Make the display become brighter slowly after the power is supplied.
- Cabinet Indicator: Enable/Disable cabinet indicators.
- Afterglow Control Signal: Enable or disable afterglow control signal.
- Afterglow Control Polarity: Enable it to set the polarity to high. Disable it to set the polarity to low.
- Low Latency: Enable/Disable low latency. When this is enabled, the receiving card can reduce image delay by 1 frame.
- Cabinet Monitoring
 - a. Select the metrics you want to monitor, which include Fans, Power Supply, Temperature, and Humidity.
 - b. Set relevant parameters and alert thresholds.
- Calibration Switches
 - a. Enable/Disable the calibration switches as you need. Switches include Brightness, Brightness & Chroma, Full-grayscale, Low-grayscale, and Seams.
 - b. Select Threshold and set the values for R, G, and B.

Threshold: When the grayscale level is less than or equal to the specified level, use the average calibration coefficients, other than the pixel level calibration coefficients. This fixes the display problems in low grayscale after the screen is calibrated, such as mottling, color blocks and grayscale spikes.

The R, G, and B values are the Y-axis values corresponding to the X-axis values (the specified grayscale level) in the Gamma table. If the device does not support individual Gamma adjustment for RGB, set the R, G and B to the same value.

- LED Errors
 - a. Select **Enable** if the cabinet supports LED error detection.

Currently only the XM11202G driver chip is supported.

- b. Select Short circuit & Open circuit.
- c. Set Voltage Threshold.
- d. Set Open Circuit Voltage Threshold for R, G, and B.
- e. Click LED Errors
- f. View the errors of the cabinet.
- g. Click **Details** to view the errors of each module.

3.3.2 Manage Cabinet

On the homepage, click Cabinet to display the Cabinet Files screen.

Figure 3-23 Cabine	et Files			
	iii Cabinet Burn	Calibration	Q Blackout	Screen Normal V Brightness 0 100 %
Cabinet Files		ĺ	+Add Cabinet ≓Move ▲Imp	ort ≜ Export ≜ Release Delete € Generate Library
Q Search Folder	No. Cabinet Model	Manufacture Rv Card S RES S7	Driver Chip Scans 🖓 Version 🖓 Re	vision 7 Completed Updated 🗄 Operation 🗠
🖿 Folder	1 NewCabinet71fde494	AET 498x161	ICND2065 8 1.1.4.8 0	Unfinished ① 2024-01-17 10:10:22 Edit Send More
	2 relijiaozheng_1303	Absen 256x192	ICND2055 32 1.3.0.3 0	• Unfinished ① 2023-07-03 14:43:05 Edit Send More
	In Total 2 Items, Find 2 Items			< 1 > 15Items /Page V

Do the following as required:

Move Cabinet

Select one or more cabinets and click **Move**. On the pop-up window, select how to move the module and then click **OK**.

Move	\times
Selected Folders: 1	
Method: Cut Copy 	
Move To:	~
	Cancel OK

Import Cabinet

Click Import, select a cabinet file, and then click Open.

Export Cabinet

Select one or more cabinets and click Export. Then, select a file path and click Save.

Release Cabinet

Select one or more cabinets and click Release. Click Confirm on the pop-up window.

Click **History** on the pop-up window to check the released versions. Released versions will also be added to **Libraries** > **Cabinet Version**.

- Delete Cabinet
 - Select one or more cabinets and click Delete.
 - Click More and then select Delete from the pop-up menu.
- Edit Cabinet

Click Edit or double-click to change the cabinet setup. Once complete, click Save.

You can also go to Libraries > Cabinet Version and click Edit to change the cabinet setup.

- Send Cabinet
 Click Send to send the cabinet library file to the receiving card.
- Copy Cabinet

Click More and then select Copy from the pop-up menu. Enter a new cabinet name and then click OK.

Generate Library

Cabinet Library File (.ncp) contains receiving card configuration file and firmware package.

- a. Once a cabinet is released, select the cabinet and click Generate Library.
- b. Enter a library name and company name on the pop-up window.
- c. Click **Browse**, select a path, and then click **Save**.
- d. Click **OK** to generate a cabinet library file.

Figure 3-24 Generate Cabinet Library File

Generate Cab	inet Library File	
* Name:	Test	
* Company:	Other License or dongle manufacturer information	
Remarks:		
* Path:		Select
		Cancel OK

3.4 Burning Program

Note

When the module has a flash memory, a serial number can be burned into the module. Smart module program can be burned into smart modules.

3.4.1 Single Cabinet Burn

- Step 1 On the homepage, click Burn.
- Step 2 On the Single Burn tab, click Read to read back and display the cabinet information.

Figure 3-25 Single Burn

Single	Burn Batch Burn		
Ca	inet module info Only the first cabinet selected is shown	Read Detect Flash Clear	Burning Settings CabLib File
	← ↔	12	Cablub Hile Browse Use File Layout Cabinet File: Rt Card Mode: Library Name: Input Type: O Manual Scanner Generation Order: 1 2 Module SN start: Cabinet SN start: Fill in SN Burn cabinet library file Burn Number of burned:0 Clear

Only the first cabinet and its serial number will be displayed on the screen. Click **Detect Flash** to check the module flash status.

- 🔁: Zoom out the cabinet.
- (+): Zoom in the cabinet.

Step 3 Fill in the burning settings.

- Burn Cabinet File
 - a. Click Browse.
 - b. On the pop-up window, click **Import**, select a cabinet file (.ncp), and then click **Open**.
 - c. Click OK to close the prompt once the file is imported.

Ca	binet Library								×
									Import
No.	Cabinet Model	Version	Status	Revision	Library Name	RES	Pixel Pitch	(mm)Max Frame F	RateReceiving Card
1	2065	1.1.4.9	Test		2055	160*80	1	60	A10s Pro
								Cancel	ОК
<u></u>									

d. Click OK to close the Cabinet Library window.

The cabinet related information is displayed on the right of the screen.

- e. If the module layout in the cabinet is different from what is in the cabinet file, click **Use File Layout**. Otherwise, skip this step.
- f. Select Burn cabinet library file.



Burn Module SN

Do the following according to the input type of the serial number.

Input manually.

Select **Manual** as the input type. Select the generation order, enter the module and cabinet start serial number, and then click **Fill in SN**.

: Generate module SNs from top to bottom for all the columns from left to right.

. Generate module SNs from left to right for all the rows from top to bottom.

Input by scanner.

Select **Scanner** as the input type. Select the generation order, and follow the order to scan the barcodes on the modules to read the serial numbers.

Click Clear to remove the serial numbers on the screen.

Step 4 Click Burn once you are done.

Click Clear if you want to reset the number of cabinets burned to 0.

3.4.2 Batch Burn

- Step 1 On the homepage, click Burn.
- Step 2 Select Batch Burn tab.

Figure 3-26 Batch Burn

urning Settir	ıgs								
Burn Cabine			Stored Imag	ge: 🔘	Burn Module:				
Cabinet File:	Browse		+	⊙ Fill	🔲 Smart Modu	Browse		Generation Order:	Z. V.
Cabinet SN:	SN Prefix	+ 0000 Suffix	Upload	 Stretch Center 	Module SN:	SN Prefix	+ 0000 Suffix		
evice List							🕀 Detect Flash 🛛 🗘 Refres	h ③ Restart	Batch Burn
No. Rv	v Card Model	Firmware Version	Cabinet SN	Stored Image	Smart Module P	Program Module SN	Module Flash	Operation	

Step 3 Fill in the burning settings according to the following.

- Burn Cabinet File
 - a. Set Burn Cabinet File to .
 - b. Click Browse, and then select a cabinet file from the pop-up window or click Import to import a cabinet file.
 - c. Click OK to close the Cabinet Library window.
 - d. Enter the cabinet start serial number.
- Stored Image

For CX series + 5G receiving card, or 5G receiving card + 5G network card.

- a. Set Stored Image to O.
- b. Click Upload, and then select an image and click Open.
- c. Select Fill, Stretch, or Center.



- Burn Module
 - a. Set Burn Module to O.
 - b. For customized smart module program, select **Smart Module Program** > click **Browse** > select the program file > click **Open**. Otherwise, skip this step.
 - c. Enter the module start serial number.
- Step 4 Select the cabinets you want to burn under the device list.

Click Refresh to refresh the list.

Step 5 Click Batch Burn.

You can also perform the following operations if needed:

- Detect Flash: Click Detect Flash.
- Restart Cabinet: Click Restart.

3.5 Calibration Coefficients Management

On the homepage, click **Calibration** to open the Calibration Coefficients screen. Select one or more cabinets to perform the following operations as required.



LCT/10. Selected		Cabinet	Calibration	Q Blackout	Screen Normal V	Brightness 100 % Gamma 2.4 0
Cabinets					Calibr	U 🖾 Sa 🖉 Re 🖉 Er
🗌 No.	Cabinet Model	Cabinet SN	RES	Rv Card Model	Firmware Version	Operation
P1-1				A10s Pro	V1.1.6.0	Upload Save More
P1-2				A10s Pro	V1.1.6.0	Upload Save More
					<	1 > 15ltems /page ∨

Enable/Disable calibration switches

- Step 1 Click Calibration Switches.
- Step 2 Set Brightness, Brightness and chroma, Full-grayscale, and Low-grayscale on the pop-up window.

The calibration switches are set to disabled by default. To enable, set the switches to

Figure 3-28 Calibration Switches	
	×
Disabled by default. Set it manually and click Save to HW to take effect	
Brightness Brightnes Full-gra Low-gr	
	_
Cancel Save to HW	

Step 3 Click Save to HW once you are done.

Upload calibration coefficients

Step 1 Click Upload.

Step 2 On the pop-up window, click **Browse** > select a calibration coefficient file (.db) > click **Open**.

ge. e e _e		
Upload File		×
	Upload coef file and apply to screen effect	
Coef File:		Select
Calibrated:		
RES :		
System Typ	e: Select All 📄 Brightness and chroma 📄 Full-grayscale	Low-gr
File Desc:		
	Cancel	Save to HV

Figure 3-29 Upload File

- Step 3 Select the type of calibration coefficients, which include Brightness and chroma, Full-grayscale, and Lowgrayscale. To select all types at once, check Select All.
- Step 4 Click Save to HW once you are done to save the coefficients to the receiving card.

Save calibration coefficients

- Step 1 Click Save.
- Step 2 On the pop-up window, select the target location and type of the calibration coefficients to be saved.

Save To:	System 1	
User area in Rv card Flash	Brightness and chroma	
Factory area in Rv card Flash	Full-grayscale	
Module Flash	Low-grayscale	

Step 3 Click **OK** once you are done to save the coefficients to the target location.

Read calibration coefficients

Step 1 Click Read.

Step 2 On the pop-up window, select the source location and type of the calibration coefficients to be read.

Figure 3-31 Read Back Coefficients

Read Back Coefficients	X
Read FrcUser area in Rv card FlashFactory area in Rv card Flash	System 1 Brightness and chroma Full-grayscale Low-grayscale
Read back the saved coefs and apply th	em to the display effect Cancel OK

Step 3 Click **OK** once you are done.

Erase calibration coefficients

Step 1 Click Erase.

Step 2 On the pop-up window, select the target location and type of the calibration coefficients to be erased.

Erase Coefficients	
Erased: User area in Rv card Flash Factory area in Rv card Flash	System 1 Brightness and chroma Full-grayscale Low-grayscale 8bit 16bit R 0 G 0 B 0
Erase the saved coefs and apply to the d	lisplay effect. This operati Cancel u OK

Step 3 Click **OK** once you are done.

3.6 Library Management

3.6.1 Manage Cabinet Version

On the homepage, click Libraries. In the Cabinet Version tab, do the following as required:

View Cabinet Version

Click \checkmark to view more information about the cabinet version.

Edit Cabinet

Click Edit to change the cabinet version information.

Figure 3-33 C	Cabinet Version
---------------	-----------------

LCT/I0.40.51.70 Image: Cabinet Cards Image: Cards Imag	Cabinet Tool V1.0	0.2 Beta4 Tools Authorize Si	ettings Help				- 🗆	×
Manufacturers Name Cabinet Model Rv Card Model Version Revision ApplyTime Operation ^ AOTO / 2053xiangti / CA50 / 4.4.1.53 <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>% 🗘</th></t<>								% 🗘
* AOTO / 2053xiangti / CA50 / 4.4.1.53	CabinetVersion F	Program Libraries Chip Libraries C	Calibration Coefs					
	Manufacturers	Name Cabinet Model	Rv Card Model	Version	Revision	ApplyTime	Operation	
AOTO 2053xiangti CA50 4.4.1.53 1 2023-03-22 10:59:04.742 Edit	AOTO / 2053xian	gti / CA50 / 4.4.1.53						
	ΑΟΤΟ	2053xiangti	CA50	4.4.1.53	1	2023-03-22 10:59:04.742	Edit	

3.6.2 Manage Program Libraries

On the homepage, click Libraries and then go to the Program Libraries tab.

Figure 3-34 Program Libraries

binet Tool	V1.0.2 Beta4 Tools Authorize Setting	; Help				-	
No devices Selected:		Burn Calibration	© Libraries	Q Blackout	Screen Normal V Brightn		100 % 2.4
pinetVersio	on Program Libraries Chip Libraries Calibr	ation Coefs				≛ Im 1 Ex	🗊 De
No. 🕴	Program Name 🖓	Program Type 🖓	Device Model 🖓	Version 🖓	Created 🗄	Operation	1
1	DATA_A10s Pro_V1.1.4.8.T11.5264	Rv Card Program	A10s Pro	1.1.4.08	2022-12-29 16:36:48	Details Delete	Export
Total 1 Ite	ems, Find 1 Items				< 1	> 15Items	/Page ∨

Do the following as required:

Import File

Click **Import** and then select a program file (.image) on the pop-up window and click **Open**.

Once imported, the program file will be available when upgrading cabinet.

Fetch from Cloud

Click Fetch from Cloud and then search for and download programs on the pop-up window.

		Search Program: Driver IC,	Decoding IC			Q Se
Cloud	Library:5					₫ Do
	No. 🛊	Program Name 🖓	Program Type 🖓	Rv Card Model ∑	Version 🖓	Download StatiOperation 🔊
	1	Data_A10s Pro_1.2.1.153	Rv Card Program	A10s Pro	1.2.1.153	Download
	2	Data_A10s Pro_1.2.1.153	Rv Card Program	A10s Pro	1.2.1.153	Download
	3	Data_A10s Pro_1.2.1.153	Rv Card Program	A10s Pro	1.2.1.153	Download
	4	Data_A10s Pro_1.2.1.153	Rv Card Program	A10s Pro	1.2.1.153	Download
	5	Data_A10s Pro_V1.2.0.3	Rv Card Program	A10s Pro	V1.2.0.3	Download

Export File

Select one or more files and click Export. Select a file path on the pop-up window and click OK.

Delete File



Select one or more files, click **Delete** and then click **OK**.

View Details

Click **Details** to check more information about the program in the pop-up window.

Figure 3-35 Program details

rogram	Detail					\times
Basic Info	Functions	Driver IC				
Program	n Name:DATA	A_A10s Pro_V1	.1.4.8.T11.5264			
Progra	am Type:Rv C	ard Program				
Device	e Model:A10s	Pro				
Program	Version:1.1.4	.8				
Program	Descript					

3.6.3 Manage Chip Libraries

On the homepage, click Libraries and then go to the Chip Libraries tab.

Selected:	Module Cab	binet Burn	Calibration	*	Freeze Frame Rate	60.00Hz V Gamma 2.4
abinetVersio	n Program Libraries Chip Libraries	Calibration Coefs				± Im ≜ Ex 🗊 De
No. 🗄	Model	Chip Type 🖓	Manufacturer 🖓	Algorithm Version 🖓	Description 🖓	Created ‡
1	CFD555A	Driver Chip	Unknown	V1.0.0		2023-02-23 14:06:00
2	CFD555B	Driver Chip	CHIPONE	V1.0.0		2023-06-12 10:36:00
3	CS2033	Driver Chip	CHIPONE	V1.0.0		2023-06-12 10:36:00
4	DP3264	Driver Chip	DEVELOPER	V1.0.0		2022-09-19 11:28:00
5	ICN2053	Driver Chip	CHIPONE	V1.0.0		2022-09-17 13:50:00
6	ICND2055/ICND2065	Driver Chip	CHIPONE	V1.0.0		2022-08-12 11:15:00
7	MBI5253B	Driver Chip	Macroblock	V1.0.0		2022-09-23 11:28:00
8	MBI5264	Driver Chip	Macroblock	V1.0.0		2022-09-15 16:00:00
9	ICND3065	Driver Chip	CHIPONE	V1.0.0		2022-08-12 11:15:00
10	ICND2055/ICND2065	Driver Chip	CHIPONE	V1.0.0		2022-08-12 11:15:00
11	ICND2076	Driver Chip	CHIPONE	V1.0.0		2022-08-12 11:15:00
12	ICND2165/ICND2055S	Driver Chip	CHIPONE	V1.0.0		2022-08-12 11:15:00
13	ICND2263/ICND1063	Driver Chip	CHIPONE	V1.0.0		2023-06-12 10:36:00
14	ICND3065	Driver Chip	CHIPONE	V1.0.0		2022-08-12 11:15:00
15	MBI5051B	Driver Chip	Macroblock	V1.0.0		2022-09-13 10:28:00

```
Figure 3-36 Chip Libraries
```

Do the following as required:

Import File

Click Import and then select a chip file (.zip) on the pop-up window and click Open.

Export File

Select one or more files and click Export. Select a file path on the pop-up window and click Save.

• Delete File

Select one or more files, click **Delete** and then click **OK**.

3.6.4 Manage Calibration Coefs

On the homepage, click Libraries and then go to the Calibration Coefs tab to import, export, and delete calibration coefficient files.

Figure 3-37 Calibration Coefs

Cabinet Tool V1.0.3.T2 Tools Authorize Settings	Help				- 🗆 X
Selected:		© braries	O Blackout Screen No * Freeze Frame Rate 60.00		100 % ¢ 2.4 ¢
CabinetVersion Program Libraries Chip Libraries Calibra	tion Coefs			± Im	£Ex
No. File Name Correction Object	Factor Type RES	SN	File Desc P	ublish Time Op	peration
		No data			
				< >	15ltems /page ∨



4 Display Management

4.1 Set Test Pattern

Select **Tools** > **Display Test** from the menu bar to set up test patterns. For detailed instructions, please refer to *Test Tool User Manual*.

4.2 Collect Display Data

Use a colorimeter to collect the display data and save it as a file.

Prerequisites

Use a CA410-VP427, CA410-P427, or CA410-P427H (when brightness is over 3,000 nits) colorimeter and complete the device connection.

Procedure

- Step 1 From the menu bar, select Tools > Collect Display Data.
- Step 2 Select a colorimeter model from the drop-down list.

When the hardware connection is normal, the Cabinet Tool will automatically establish communication with the colorimeter after selecting a model.

Figure 4-1 Display Data Collection

Display Data	Collection									\times
Controller: Display Windo Display Color:		○ Y: 0 ✓ Grayscale I	W: 256 ncremental:	Col	lorimeter: 256 Grayscale		se dupl	Not connection of the connecti	and ensure that the graphics card is in full perform	
Lv(cd/m²)	x 	у	Tcp(K)	Lv,x,y	Тср	Data			t Export ☆ Clear	
$ \begin{array}{c} 0.9 \\ 520 \\ 0.8 \\ 0.7 \\ 0.6 \\ 500 \\ 0.5 \\ 0.4 \\ 0.3 \\ 0.2 \\ 0.1 \\ 480 \\ y \\ x \\ 0.1 \\ 460 \\ x \\ 0.1 \end{array} $	540	560	600 					No data		

Step 3 Set the window coordinates and dimcensions for the test pattern.

Step 4 Select a color for the test pattern from the drop-down list.

Step 5 Set a fixed grayscale value or enable Grayscale Incremental by toggling on O and specify the grayscale range.

Step 6 Click Collect.

Step 7 Once the collecting process is completed, click **Export**. Then, select a file path on the pop-up window and click **Save**. www.novastar.tech PAGE 34

To clear the collected data, click Clear.

4.3 Screen Control

Click **Blackout** or **Freeze**, or select **Normal** or other images on the top right of the homepage to set the displayed image and set frame rate.

- Blackout: Black out the displayed image and the input image remains normal.
- Freeze: Freeze the displayed image and the input image remains normal.

4.4 Set Brightness and Gamma

Set the brightness and Gamma values on the top right of the homepage.

5 Software Settings

5.1 Changing the display language

From the menu bar, select **Settings** > Language and select the target language.

5.2 View Software Information

From the menu bar, select **Help** > **About**. On the pop-up window, click **Release Notes**, **User Agreement**, or **Website** for more detailed information.

5.3 Update

From the menu bar, select **Help** > **Update**. On the pop-up window, check if there is any updated version. If yes, click **Update Now**.

5.4 View User Manual

From the menu bar, select Help > User Manual to open the Cabinet Tool user manual.

5.5 Export Log

From the menu bar, select Help > Export Log > choose a path in the pop-up window > click OK to export the log.



6 Troubleshooting

6.1 Display flashing when debugging frame rates at certain rates

<u>Issue</u>

When debugging frame rates at certain rates, the screen image is displayed at the right position as supposed, but it actually flickers and flashes.

Possible Causes

Black field time is too low.

Solution

Increase black field time.

6.2 Pixel flickering when debugging at certain frame rate

<u>Issue</u>

When debugging at certain frame rate, the screen image is displayed at the right position as supposed, but pixel flickering can be seen on the screen.

Possible Causes

- Cause 1: DCLK phase and duty cycle are not set correctly.
- Cause 2: Display blurring/flickering at high frame rates may be caused by insufficient receiving card bandwidth or load capacity.

Solution

- Solution 1: Adjust DCLK phase and duty cycle.
- Solution 2: Adjust the configuration.

6.3 The screen brightness is reduced at frame rates over 100 Hz

<u>Issue</u>

The screen brightness is reduced at frame rates over 100 Hz.

Possible Causes

The black field time is too low at higher frame rates.

Solution

Increase black field time.

6.4 Afterglow issue for slash lines

<u>Issue</u>

The afterglow problem occurs when the test pattern contains slash lines.



Possible Causes

- The blanking time is less than 300 ns.
- The line changing time and the blanking time do not match.

Solution

Adjust the line changing time and the blanking time.

6.5 Color cast at low grayscale for gradient test patterns

<u>Issue</u>

The color cast problem occurs when the test pattern is set to gradient.

Possible Causes

The driver chip register values are not correct.

Solution

Adjust the driver IC register values via the Cabinet > Edit > Display Mode tab.



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