Installation Manual - English Version

Bluestar LED Display Installation Manual

Unpacking and Inspection - Structural Installation - Power Cabling - Signal Cabling - NovaLCT Configuration - Mapping and Lighting - Troubleshooting



Figure 1 - A lit LED display wall. This manual takes you from unboxing to this point: build the wall, connect the cables, configure the screen, light it, and save.

This manual covers only **Installation and Commissioning**: take the cabinets out of the flight cases, assemble them into a wall, connect the power cables and the signal cables, set the configuration correctly in NovaLCT, light the whole wall, and save and store it to hardware. Day-to-day playback, programme scheduling and long-term maintenance are outside this manual's scope - see the LED Display User Manual.

The book follows the on-site sequence: Chapters 0-2 are preparation and wall building before you start; Chapters 3-5 are cabling; Chapters 6-9 are software configuration and lighting; Chapters 10-11 are playback and finishing; Chapters 12-13 are troubleshooting and module replacement. At the end of every chapter there is a **Pass check box**: only when every condition in the box is met do you move on to the next chapter.

> **One thing to be clear about first:** Structural installation and mains power cabling must be carried out and inspected by qualified personnel. The steps in this manual do not replace local electrical and structural codes; if you are unsure about any step, stop and contact Bluestar technical support (WhatsApp: +86 155 7321 7152).

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Find a Page by Task

What you need to do	Go to
First time building a wall and do not know where to start	Start on page 3 and work through the chapters in order
Calculate how many cabinets one power branch can carry at most	Page 8 (quick reference: page 23)
Select a processor and calculate how many data ports you need	Chapter 11 (quick reference: page 23)
No computer on site; use the processor panel to map	Page 16 **NEW**
Only part of the image shown after mapping	Page 17; troubleshooting: page 20
Scrambled image, wrong order	Fault table on pages 20-21
Replace a faulty module	Page 22
Fill in this order's installation data	Job Sheet on page 26

Numbering rule: throughout the book, cabinet positions are numbered from the **Front view** numbering R1C1 - R is the row (counted top to bottom), C is the column (counted left to right). When wiring from behind the wall, left and right are reversed; numbering always follows the front. Items marked **NEW** items are new in this edition: front-panel mapping on the processor, one-port-per-row routing, using the arrow on the module back to set direction, and data ports with no in/out direction.

Chapter 0

Scope and Safety Notes

First confirm which type of screen you have, then confirm who does which step.

Applicable models

Series	Cabinet	Typical models	Covered by this manual
Rental screen (die-cast aluminium)	500x1000 mm	P3.91 / P2.9 / P2.6, indoor and outdoor	Main line of the whole book; the examples are based on this
Rental screen (die-cast aluminium)	500x500 mm	P3.91 / P2.9 / P2.6, indoor and outdoor	Whole book; routing differences are noted in Chapter 4
Fixed screen (steel cabinet)	960x960 mm	P5 outdoor	For structure and power, follow the fixed-screen notes in Chapters 2 and 3
Fixed screen (die-cast aluminium)	640x640 mm	P5, indoor and outdoor	Same as above
Poster screen (complete unit)	640x1920 mm complete unit	P2.5 indoor	Short version: a floor-standing complete unit - no unboxing and wall building; for installation and power-on see the poster screen chapter of the User Manual

What a wall is made of

Building a wall needs only four things: **LED cabinets, power cables, data cables and one LED video processor**. The signal chain works like this: the computer or another signal source sends the image into the processor; the processor converts the image into data and sends it via network ports to every cabinet; the **Receiving Card** receives the data and lights this cabinet's module pixels. If the cabling order or the mapping order is wrong, the result is a scrambled image or no signal - everything in the second half of this manual is, in essence, making every step of this chain line up.

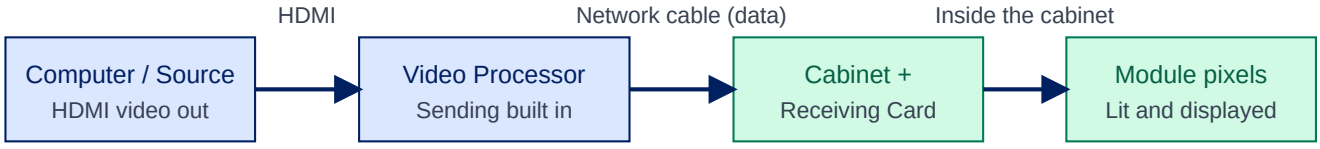

Figure 2 - System composition: signal source to processor to cabinet receiving card to module. USB carries configuration only (Chapter 5).

Three things that are easily confused - separate them first:**RCFG receiving card file** controls the module drive parameters and each cabinet's pixel load; **Screen Connection (mapping)** controls each receiving card's position and order on the wall; **Processor preset** controls the signal source and scaling. The three are covered in Chapters 7, 8 and 9 respectively; if any one of them is wrong the symptoms differ - do not try to fix one by adjusting another.

Chapter 0 (continued)

Safety Red Lines and Common Terms

Safety red lines (no exceptions):

- Structural installation, rigging and mains power cabling must be completed by qualified personnel to local codes and signed off; if the inspection fails, do not energise.
- Before touching any cable, isolate the power and verify it is dead; never plug or unplug power connectors live.
- Do not stack the next row until cabinets are locked tight; do not let anyone stand under the wall until rigging is complete.
- For the first power-on, start at low brightness on a black field (Chapter 11); confirm there is nothing abnormal before raising the brightness.

Prepare everything before starting

[ ] This order's packing list, project drawings (dimensions, installation method, hanging bar quantity) and Job Sheet (page 26)

[ ] The RCFG file and configuration files approved for this order (supplied by the factory with the screen; screens already configured by the customer go straight to Chapters 10 and 11)

[ ] One computer (with NovaLCT installed, see Chapter 6), an HDMI cable, a USB control cable, and network cable (Cat5e or better)

[ ] Multimeter, insulated gloves, labels and a marker (label both ends of every cable)

[ ] Spare modules, spare power supplies and spare receiving cards, several of each, matching this order's models

Common terms (full glossary on page 24)

Term	What it means
Cabinet	The basic unit of the wall, containing modules, a receiving card and power supplies; a 500x1000 cabinet has 2 x 200 W power supplies in parallel inside.
Module	The board carrying the LED lamps, fixed to the cabinet front by magnets or screws; dead pixels are usually on a module.
Receiving Card	One per cabinet; receives the data from the processor and lights this cabinet's pixels.
Mapping	tells the processor where each receiving card is on the wall and in what order it is connected; if the order is wrong, the image is wrong.
RCFG	The receiving card configuration file, containing module drive parameters and the cabinet pixel width/height; use only the file approved for this order.
Save / Store to Hardware	Writes the configuration into the hardware so it survives power-off; if you do not save, you will have to configure again at the next start-up.
Zone	the area of cabinets served by one data port; the number of zones decides how many ports you need and which processor to choose.

Example convention: the main example throughout the book is a **4x3 m wall** - 500x1000 mm cabinets, 8 columns x 3 rows, 24 cabinets in total; the secondary example is a **500x500 mm cabinet wall of 7 columns x 3 rows** (P2.6, 192x192 pixels per cabinet), used to explain the one-port-per-row routing. If your wall is a different size, substitute the numbers using the same method - the formulas are given in the relevant chapters.

Pass - before Chapter 1: Model matches the order; persons responsible for structure and electrical work are in place; all red-line items are known by everyone; tools, files and spares are ready.

Chapter 1

Unpacking and Inspection

Count first, inspect for damage second, build the wall third. A bad cabinet built into the wall costs the most rework after the wall is lit.

1 Count against the packing list

Count cabinets, flight cases (or wooden cases) and accessory cases item by item: cables, power supplies, spare modules, hanging bars, connecting plates and screws are all in the accessory cases. If a count does not match, record it first - do not start assembling.

2 Inspect the appearance

Inspect every cabinet's corners, LED face, latches and handles. Photograph transport damage for the record before handling it; do not remove corner protectors until the cabinet is in position - they protect the edges of the LED face.

3 Check labels

Check model, batch and pixel pitch against the order item by item and record them on the Job Sheet (page 26). Isolate any cabinet whose label does not match the order - do not build it into the wall.

4 Isolate problem cabinets

Put cabinets with damage, mismatched labels or LED-face abnormalities aside separately, label them, and decide whether to use them only after confirmation.

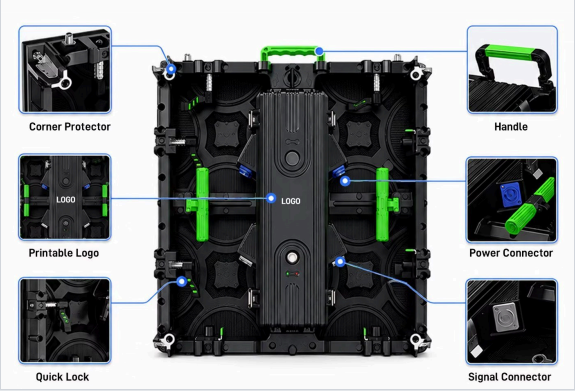

Figure 3 - Rental cabinet: the front is the LED display face; the back has handles, latches and the central power box. Connector layout follows the actual cabinet in your hands.

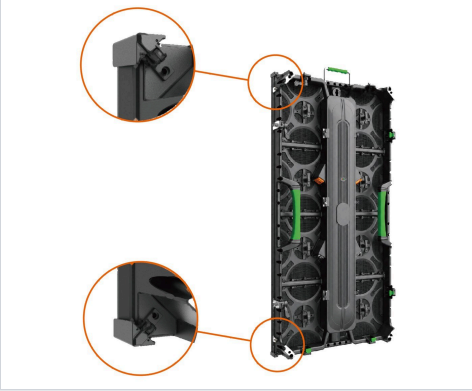

Figure 4 - Corner protectors protect cabinet corners and the edges of the LED face; do not remove them during transport and stacking; when inspecting, first check whether the protectors have taken a hit.

Handling reference weights

Cabinet	Weight per cabinet	Description
500x1000 mm rental cabinet	15 kg	Two people recommended
500x500 mm rental cabinet	7.5 kg	One person can carry it; support the LED face side
960x960 mm fixed steel cabinet	28 kg	Carry with two or more people
640x640 mm fixed cabinet	12 kg	Two people recommended

Pass: Quantities, models and batches match the order; transport damage photographed and recorded; problem cabinets isolated; key data written on the Job Sheet.

Chapter 2

Structural Installation (Part 1): Building the Wall

The order is always: decide the method, stabilise the base, align and lock cabinet by cabinet, and check section by section.

1. **Set the installation method from the project drawing**
   Ground stacking or rigging - use only the method specified by the order and the project design. Build ground stacks from the bottom row up; rigging is carried out by qualified riggers in the specified sequence.

2. **Stabilise the base first**
   Level the base and have the rear supports, anti-tip measures and ballast in place before stacking cabinets. Do not think about stability only after you are halfway up.

3. **Assemble cabinet by cabinet**
   Seat the locating pins first, align the cabinets flush, then lock the latches. Not all latches turn 90 degrees - locked firmly is the criterion; do not force latches.

4. **Lock curved cabinets at the design angle**
   Lock curved cabinets (product name marked Gabinete curvo) cabinet by cabinet at the design angle; a wrong angle means dismantling the whole section to rework it - stop immediately if something looks wrong.



Figure 5 - The two approved assembly methods: rigging on a truss (left) and ground support (right). Use only the one specified for your order.

Hanging bar quantity (confirm when ordering; this manual gives formulas for rental cabinets only)

Cabinet	Hanging bar size	Quantity
500x1000 / 500x500	0.5 m (default)	Longest side (m) x 2
500x1000 / 500x500	1 m	Longest side (m) x 1
640x640	0.64 m	No formula; confirm per order
960x960	0.96 m	Longest side (m) x 1

When planning area and cabinet count for 960x960 cabinets, count about 1x1 m per cabinet (e.g. 3x3 m = 9 cabinets); but cut the steel structure to the exact 0.96x0.96 m.

Chapter 2 (continued)

Structural Installation (Part 2): Alignment and Checks

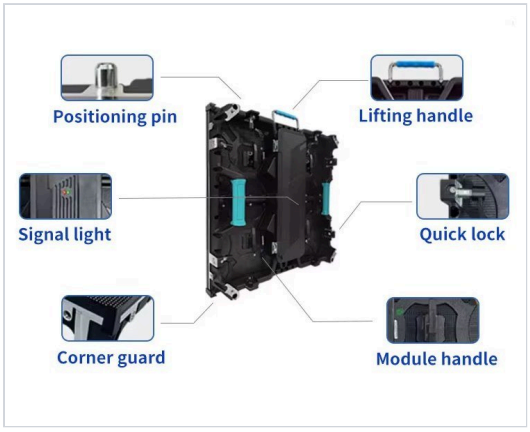

Figure 6 - Cabinet side detail: locating pins, handle, signal light, quick locks, corner protectors and module handle. When assembling, identify the locating pins first, then work the latches.

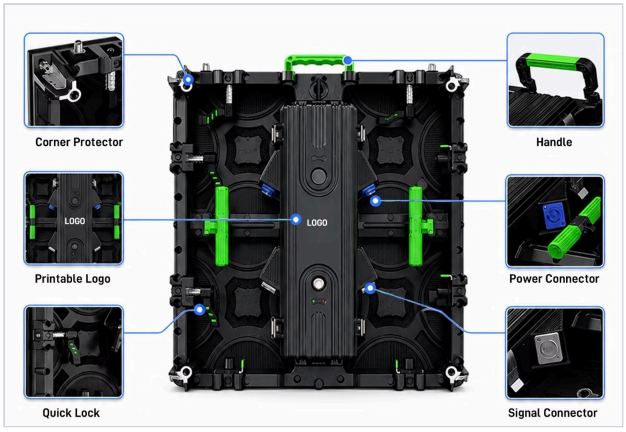

Figure 7 - Back of a 500x500 cabinet: positions of the corner protectors, handles, quick locks, power connectors (blue) and signal connectors.

After building each section, stop and check four things

[ ] All latches locked firmly in place, with none missed or falsely locked

[ ] Frame connections and rear supports in place per the drawing, with no looseness

[ ] Cabinet fronts are flat: no obvious steps or misalignment between adjacent cabinets

[ ] Leave enough room for cables in and out: the routing channels for power and signal cables must not be blocked by structural parts (needed in Chapters 3 and 4)

The three most common errors

- **Stacking the next row before cabinets are locked** - the higher you go, the harder it is to correct, and the wall ends up uneven.
- **Forcing latches** - once a latch is broken the cabinet cannot lock firmly; if cabinets do not align, check the locating pins first - do not use force.
- **Curved angle locked wrong** - on a curved wall the angle accumulates cabinet by cabinet; if the first cabinet is wrong, everything after it is wrong.

The overall wall-building flow is: assemble the cabinets into the shape you want, then connect the power cables, connect the data cables, map with the processor, and plug in the signal source. Each chapter that follows works through these five steps in detail.

Do not rush to power on once the wall is built. Next, Chapter 3 connects power and Chapter 4 connects signal; only after both are connected and checked do you power on for the first time (start-up sequence in Chapter 11).

> **Pass:** Structure stable; all fasteners and latches in place; cabinets flat with no steps; enough routing space left; installation lead signed off (page 27).

Chapter 3

Power Cabling (Part 1): Calculate the Branches First

Calculate before you connect: how many cabinets can one branch carry at most, and how many branches does this wall need? Get it wrong and energising means tripping breakers or burning cables.

Basis (Bluestar rental cabinets; the order label governs)

- Site voltage **220 V**, each branch has a **16 A**, with **20% margin**, giving about 2816 W usable per branch.
- 500x1000 cabinet **Max 300 W/cabinet**: a 500x1000 cabinet contains **2 x 200 W power supplies in parallel, sharing 1 AC input**. The installed 400 W is headroom; always calculate branches at the 300 W maximum - never at 2x200 W.
- 500x500 cabinet max 150 W/cabinet, with 1 x 200 W power supply inside.

Cabinet	Max power	Max per branch at 220 V / 16 A / 20% margin
500x1000 mm	300 W/cabinet	**9 cabinets**
500x500 mm	150 W/cabinet	18 cabinets **To be confirmed by an electrician** (Estimated from 150 W; to be confirmed by the site electrician from measurements before energising)
960x960 mm fixed cabinet	Approx. 553 W/cabinet	Calculated by the electrician from measured power; do not apply the two rows above

Example: a 4x3 m P3.91 wall

24 cabinets of 500x1000, 12 m2 in total, 7.2 kW maximum total power. Each branch carries at most 9 cabinets, so you need **3 branches**: 3 branches of 8 cabinets each (3x8 = 24). Each branch has its own breaker and its own label, and the label states which cabinets that branch carries (by R1C1 numbering).

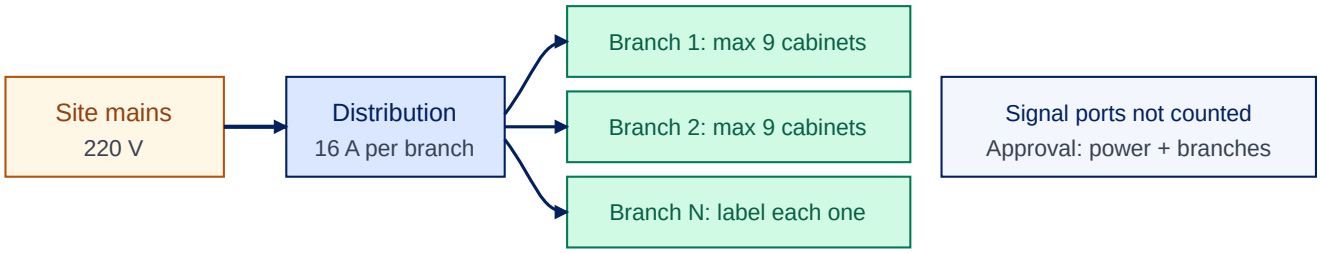

Figure 8 - Power branches: mains to distribution to breaker per branch to cabinet AC IN. Cabinets per branch by max power.

> **Common mistake:** Power grouping and signal grouping are two independent divisions - never copy one from the other. One data port carrying 12 cabinets does not mean one power branch can carry 12 cabinets.

Chapter 3 (continued)

Power Cabling (Part 2): Chaining Method and Checks

1. **Confirm the voltage**
   Check each cabinet's power supply nameplate and the system label. Bluestar rental cabinets are 100-240 V auto-ranging (Auto 110/220 V), but in all cases this order governs.

2. **Chain by the rule**
   Mains power to the first cabinet's AC IN; first cabinet AC OUT to second cabinet AC IN; chain in a snake up to the branch cabinet limit; at the limit, run a new cable from the mains to the next cabinet and start a new branch.

3. **Fix the starting point**
   The snake may start at any corner, but the starting point must match the mapping click order that follows - once the wiring diagram is drawn, do not change the starting point midway.

4. **Locking and protection**
   Lock every connector tight and provide strain relief; protect temporarily unused connectors as required - do not leave them dangling against water or metal structures.

5. **Electrician's check**
   Measure earthing, insulation, protection and voltage drop item by item. If it does not pass, do not energise - this step is not negotiable.

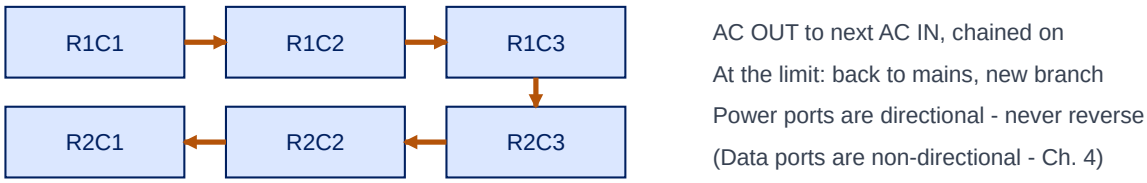

Figure 9 - Snake power chaining (front view). Write each branch's start point, end point and cabinet numbers on the Job Sheet.

There is a limit to how many cabinets one mains branch can carry, and the limit varies by brand and model - confirm it with the manufacturer. Bluestar's figures are the table on the previous page: at 220 V, a 500x1000 branch carries at most 9 cabinets; do not change this number based on other brands' practice.

> **Pass:** Voltage confirmed correct; branch count and cabinets per branch checked against the page 8 example; every branch labelled; electrician's inspection passed and signed. The number of signal ports is not a basis for power approval.

Chapter 4

Signal Cabling (Part 1): Snake Routing

Decide the routing and draw the diagram before you connect anything. Once routing is decided, do not change it midway - changing it means redoing the mapping.

1 Calculate the number of ports first

Number of zones = area / single-port area, rounded up (P3.91 approx. 9 m2/port, P2.9 approx. 5 m2/port, P2.6 approx. 4 m2/port, P5 approx. 16 m2/port). The processor must satisfy both conditions: number of ports not less than the number of zones, and total load capacity not less than the total pixels (selection table on page 11).

2 Choose the routing

Choose one of the two valid routing methods: A snake (this page, one port serving several rows and columns); B one port per row (page 11). Once chosen, draw a routing diagram for this wall, marking the port numbers and the first cabinet of each port.

3 Connect per the diagram

Processor LED OUT to the first cabinet of each port; between cabinets, **Use 1.2 m cables for vertical connections, 85 cm cables for horizontal connections**. An 85 cm cable cannot span the 1 m vertical gap; if you swap them they will not reach - do not pull them tight.

4 Apply labels

Label both ends of every cable: port number + cabinet number (R row, C column). Do not plug LED data cables into an ordinary network switch; use Cat5e or better network cable, and fibre equipment per the project plan for long distances.

> NEW **Data ports have no in/out direction:** Unlike power ports, the data ports on a cabinet have no in/out direction - 'lower port in, upper port out' is only a connection example; connecting them the other way works just the same. Do not confuse this with the direction requirement of the AC IN / AC OUT power ports. Each data chain also has a cabinet limit: 650,000 pixels per port; if you exceed it, start a new chain from the next data port on the processor and continue the snake.

Main example: 4x3 m wall (500x1000 cabinets, 8 columns x 3 rows, 24 cabinets)

The snake routing uses 2 ports, each carrying 12 cabinets. Cables per port: **8 x 1.2 m cables + 3 x 85 cm cables**; the whole wall uses **16 x 1.2 m cables + 6 x 85 cm cables**, plus 1 cable per port from the processor to the first cabinet. Each port carries 12 cabinets x 128x256 = 393,216 pixels; the whole wall is 786,432 pixels, all within the 650,000 pixel limit per port. The top half of the diagram below is the signal chain (the numbers in the cells are the click order within that port); the bottom half shows the power branches of the same wall.

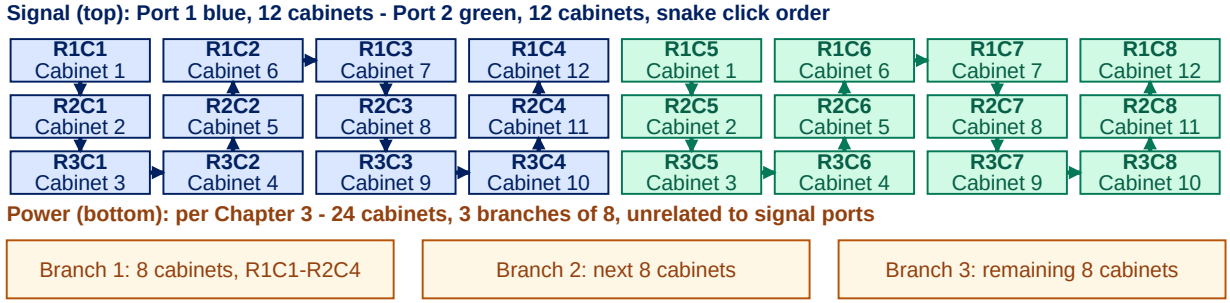

Figure 10 - Wiring diagram, 4x3 m example: signal at top, power at bottom.
Numbering is front view, R1C1. Click order: page 16; branches per electrician's diagram.

Chapter 4 (continued)

Signal Cabling (Part 2): One Port per Row and Processor Selection

NEW Another valid routing method - one port per row

If there are enough ports and no port is overloaded, you can skip the snake and instead use **use a separate data port for each row**: each row chains straight from right to left - this is called a horizontal daisy chain. The secondary example: a 500x500 cabinet wall of 7 columns x 3 rows (P2.6, 192x192 pixels per cabinet) uses 3 ports - Port 1 for the top row, Port 2 for the middle row, Port 3 for the bottom row, 7 cabinets per row and 258,048 pixels per port. When mapping, drag-select port by port from right to left (Chapter 8). Both routings are correct; decide which one you will use before cabling, and draw it into the routing diagram.

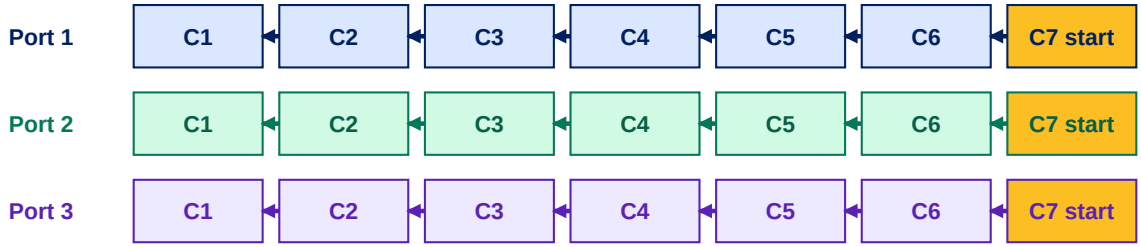

Figure 11 - One port per row (7 x 3 rows, front view): each row starts at the rightmost cabinet, chains left. Mapping: drag-select right to left, as cabled.

Processor selection (650,000 pixel limit per port)

Processor	Data port	Total load capacity	Selection guidance
CMS130	2 ports	1.3 million pixels	Small screens: when the number of zones is no more than 2 and total pixels no more than 1.3M, use one CMS130
CMS260	4 ports	2.6 million pixels	Common for small and medium screens
VX600 PRO	6 ports	3.9 million pixels	Medium screens
VX1000 PRO	10 ports	6.5 million pixels	Choose this tier for a 10x6 m P3.91 wall (60 m2), for example
VX2000 PRO	20 ports	13 million pixels	Large screens; if one unit is not enough, add more units

Both selection conditions are indispensable: **Number of ports not less than the number of zones, and total load capacity not less than the total pixels** (Total pixels = area x pixel density: P3.91 is 65,536/m2, P2.9 is 112,896/m2, P2.6 is 147,456/m2, P5 is 40,000/m2.) Looking at only one of the two conditions is the most common selection mistake.

> **Pass:** Every actual chain matches the routing diagram line by line; cable lengths are not swapped (1.2 m vertical, 85 cm horizontal); labels at both ends are complete; the left-right reversal when viewed from the back has been handled in the numbering.

Chapter 5

Controller and Computer Connections

Two cables, two jobs: HDMI carries the image, USB carries the configuration. Plug one into the wrong port and nothing after it can be configured.

1. **Connect the video cable**
   Computer HDMI output to processor HDMI / DVI input (DP / VGA are also possible - use whichever ports the model has). This cable carries the image only.

2. **Connect the control cable**
   Connect the USB cable from the computer to the USB port on the back of the processor (the VX600 uses a USB Type B square port). This cable carries configuration only; NovaLCT communicates with the processor through it.

3. **Connect the LED outputs**
   Each LED OUT port of the processor goes to the first cabinet of its planned chain in Chapter 4. All-in-one units have the sending function built in, so a separate sending card may not be needed.

4. **Record and keep isolated**
   Record the input source name, LED port numbers and control connection method on the Job Sheet. Keep the wall power isolated until the connection check in Chapter 6 has passed - do not energise.

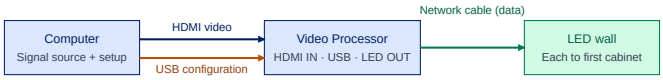

Figure 12 - Two cables, two jobs: HDMI = image, USB = configuration. LED OUT is not a LAN port.

NEW Connecting a separate sending card

With a separate sending card (not an all-in-one unit) the chain has one extra hop: computer HDMI to processor DVI / HDMI input; processor DVI output to sending card input; sending card output ports (4 ports on the example model) to the screen; then a USB cable from the computer to the sending card's rectangular port for setup.

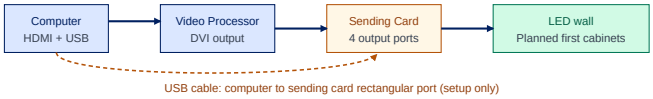

Figure 13 - Separate sending card wiring: processor DVI out to sending card, then to the screen.



Figure 14 - A laptop connected to a sending card: the USB cable carries control, the DVI cable carries the image, both into the sending card; the row below is the network port outputs.



Figure 15 - Close-up of a DVI connection: the DVI cable plugged into the DVI1 port of the sending card; the white connectors beside it are other DVI channels.

Common mistake: Plugging the control cable into an LED output port, or using an LED output port as a network port, is the most common error in this chapter. Also confirm the computer adapter really supports video output - some adapters only charge.

Pass: HDMI into the video input; control cable into the control port; every LED output port connected to its planned first cabinet; connections recorded on the Job Sheet.

Chapter 6

NovaLCT Installation and Connection

Install only the official software; log in only with the Advanced Synchronous System login, password admin.

1 Download the official version

Go to novastar.tech, Downloads, Software, and download NovaLCT. Use the specified version that matches your controller; the screenshots in this manual are V5.4.8 and the current download may be newer - if menu positions differ slightly, follow the actual menus on your computer. (Do not upgrade to the newest version at will; use the specified version.)

2 Install the software and drivers

Install only official software and drivers - do not use installation packages from unknown sources. Connect the control cable from Chapter 5 and power on the controller.

3 Confirm the device is connected

Open NovaLCT; it should show a sending device detected. If none is detected, first check whether the control port is plugged in correctly, the USB cable and driver, and the computer's network settings - do not rush into configuring.

4 Advanced login

Menu User, then Advanced Synchronous System User Login; the default password is **admin** (all lower case), and press Enter to log in. Do not use Demonstration Login for real commissioning - a demo login cannot change real hardware.

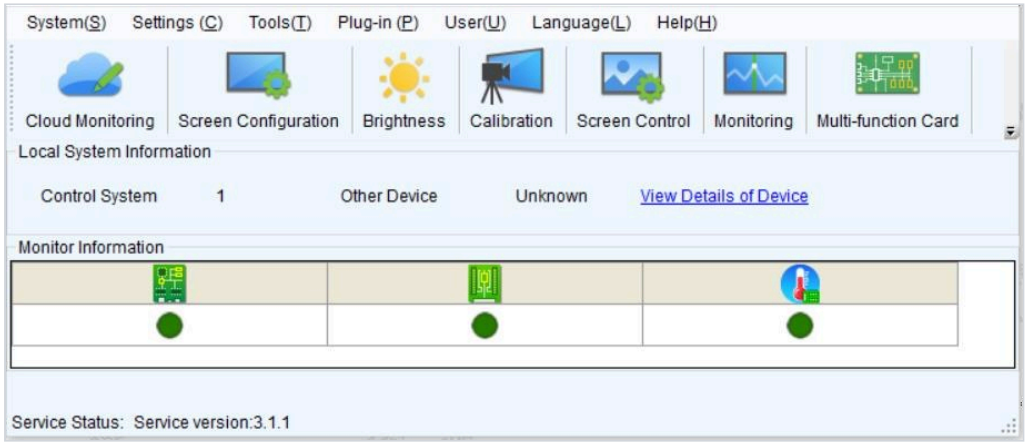

Figure 16 - NovaLCT main window after a successful connection: the sending device is detected and the status is normal. From here go to Settings - Screen Configuration (see Chapter 8). (Screenshot: NovaLCT English interface.)

About the password: This manual gives only **admin** (lower case). Do not use other numeric passwords circulating online. If the password has been changed by someone, log in with the current password and record the change on the Job Sheet.

Pass: NovaLCT reads the real sending device and the expected number of receiving cards. If the count is wrong, go back to Chapters 4 and 5 and check the cabling - do not continue configuring.

Chapter 7

Receiving Card File RCFG

Read first, check, then send. Use the wrong file and the whole wall displays incorrectly. This is not a scare tactic: the two counter-examples in this chapter (Figures 18 and 19) show the result.

1. **Separate the three things first**
   The RCFG controls module drive parameters and the pixel load of each cabinet; Screen Connection (mapping) controls position and order; processor presets control the signal source and scaling. This chapter covers only the first of the three.
2. **Check, then load**
   Go to the Receiving Card tab and load the file with Load from File. Use only the file approved for this order: module model, driver IC, scan mode and receiving card model must all match; the cabinet width/height loaded must agree with the model table.
3. **Read first, then send (recommended order)**
   Click Read from Receiving Card first and enter the sending card number (normally 1), data port number (1) and receiving card number (1) to read back the parameters already in the card and check them: a P2.6 500x500 cabinet should read 192x192, a P3.91 500x1000 cabinet should read 128x256. If they do not match, correct them first - do not overwrite blindly.
4. **Send to Receiving Card**
   Click Send to Receiving Card, and first confirm the target card is the right one. Only select All Receiving Card to send to all at once when every target cabinet really uses the same file.
5. **Save twice**
   Use Save to store the parameters into the hardware; then use Save to File to store this RCFG on the computer as a backup - if a cabinet ever loses its configuration, this file is how you restore it.



Figure 17 - NovaLCT receiving card screen (Chinese interface, original screenshot): configure each receiving card on the Receiving Card page. The top part is the cabinet information (width 240, height 180); the bottom part is the button row at the bottom of the same window (Load from File, Save to File, Read from Receiving Card, Send to Receiving Card); the two parts are from the same window and the performance parameters section in the middle is omitted. (Chinese interface, original screenshot)



Figure 18 - Counter-example (unconfigured wall): before the receiving cards are configured, every cabinet repeats the same computer desktop instead of forming one complete image.



Figure 19 - Counter-example (result of a wrong RCFG): after loading the wrong receiving card file, every cabinet displays abnormally, with only vertical stripes and a scrambled dot pattern left.

Three things NOT to do: Do not click reset-start-coordinates - that makes every cabinet show the same top-left corner of the image; do not change scan mode, timing, firmware or calibration values to fix one wrong image; do not substitute a file from another order for this order's file, even if the pixel pitch name is the same.

Pass: The correct receiving parameters have been sent, with no wrong sends; the backup file is stored on the computer, together with the final wiring diagram.

Chapter 8

Mapping and Lighting (Part 1): Software Method

Mapping means telling the processor: where each cabinet is on the wall, and in what order it is connected. If the order does not match the cabling, the image is scrambled or there is no signal.

1 Go to the Screen Connection page

Screen Configuration, then Next, then open the Screen Connection tab. With several processors, first select the one you are configuring; for a single wall, set the number of walls to 1.

2 Set the wall's shape

Enter the number of columns and rows (main example: 8 columns x 3 rows) and press Tab to confirm.

3 Select the port and set the receiving card size

Select Ethernet Port 1; the receiving card width and height must match the values read in Chapter 7 - if they do not, correct them first before proceeding.

4 Click in the cabling order

Stand at the **Front**, and click cabinet by cabinet in the actual cabling order: you can click one by one with the mouse, move with the arrow keys, connect with the quick connection buttons, or drag-select. Repeat the same operation for the remaining data ports.

5 Send and save

Click Send to HW (send to hardware); the transfer may take about 1 minute; when it finishes, check the wall, then click Save - the configuration is stored into the processor at the same time.



Figure 20 - NovaLCT Screen Connection screen (Chinese interface, original screenshot): receiving card columns 8, rows 3, matching the main example. (Chinese interface, original screenshot)



Figure 21 - Click-connection in progress (Chinese interface, original screenshot): click cabinet by cabinet in the actual cabling order; connected cabinets are joined by lines with arrows (at bottom left of the figure, the 2nd cabinet is being connected). (Chinese interface, original screenshot)

Chapter 8 (continued)

Mapping and Lighting (Part 2): Panel Method and Click Order

NEW Alternative method: Quick Configuration on the processor front panel

If there is no computer on site, you can map directly on the processor's front panel. There is only one condition for using it: **a square or rectangular wall with snake-routed data cables**. Complex or irregular walls still require the NovaLCT software method.

1. **Know the knob**
   Front-panel knob: turn to move up/down, press to confirm, Esc to go back one menu level.

2. **Go to Quick Configuration**
   Press the knob to enter the main menu, then Screen Configuration, then Quick Configuration.

3. **Set four numbers**
   number of rows (height), number of columns (width), and the number of cabinets carried by the first data port, then select a layout pattern that matches the actual cabling - patterns are always selected **as seen standing at the front of the wall** - select patterns as seen standing at the front of the wall.

4. **Saving is still required**
   After the panel method, still execute send and Save. The panel method cannot set all complex parameters; once you are back in an environment with a computer, re-check with NovaLCT.

Click order example: 4x3 m snake (front view)

The numbers in the circles in each cell are the click sequence within that port. Port 1 (blue) starts at R1C1: R1C1, R2C1, R3C1, R3C2, R2C2, R1C2, R1C3, R2C3, R3C3, R3C4, R2C4, R1C4; Port 2 (green) starts at R1C5 with the same pattern. For a one-port-per-row wall (page 11), drag-select port by port from right to left.

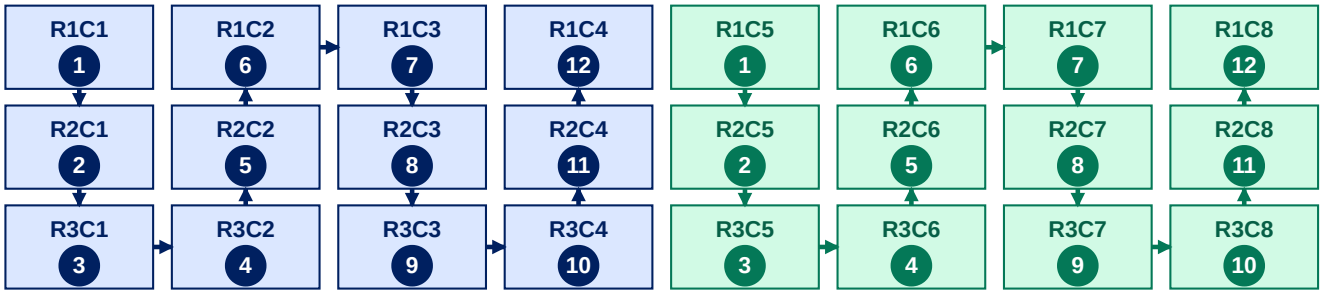

Figure 22 - Click order diagram for the 4x3 m example: blue is Port 1, green is Port 2. The click order must match the actual cabling order in Chapter 4, cabinet by cabinet.

Common mistake: Clicking from behind the wall reverses left and right - always click from the front view; do not use the default rows/columns in a screenshot in place of this wall's values; a quick layout pattern only works if it matches the actual routing.

Pass: Each cabinet is assigned only once, with the correct port number and position; after Send to HW the whole wall forms one complete image; after Save and a power-cycle restart, the parameters are still there.

Chapter 9

Processor Output and Image Fitting

If mapping is correct but only part of the image is shown, it is almost certainly not a mapping error - the processor output width/height has not been set.

1. **Confirm the total canvas pixels first**
   Read the wall's total width and height (in pixels) from the Job Sheet - do not enter millimetres.

2. **Set the output width/height**
   Go to the processor's Setup, then Output Image: **Output width = columns x cabinet width (pixels), output height = rows x cabinet height (pixels)**. Until this is set, the wall shows only part of the computer image; once set, it fills the screen.

3. **If there is a Scale key, press Scale first**
   Some processors have a Scale key on the front panel: press it and the content is scaled automatically to the wall's size; without that key, set it manually per Steps 2 and 4.

4. **Choose the fitting method**
   Fit: show the whole image, with black bars; Fill / Crop: crop the edges to fill; Stretch: stretch to fill - do not use Stretch for faces, circles or logos.

5. **Check, then save as a preset**
   Check with a circle, text and corner labels: the circle is still round, the text is readable, and all four corners are inside the image. Only when everything is satisfactory, save this set of settings as a preset.



Figure 23 - NovaLCT sending card screen (Chinese interface, original screenshot): the sending card resolution is set to 1920 x 1080, the same as the video source resolution - the sending card resolution and the video source resolution must agree for the image to reach the wall complete. (Chinese interface, original screenshot)

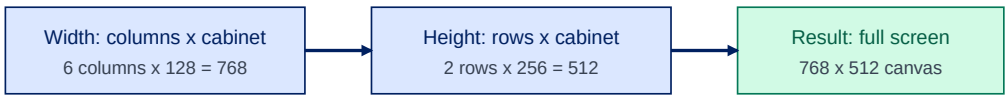

Figure 24 - Output width/height formulas (example: 6 columns x 2 rows, one cabinet 128x256). Substitute your order's columns, rows, pixels. Reference: 1024x768 canvas, 16:9 full width uses 1024x576, 96 px bars (Fit).

Note: A sending device without scaling cannot scale. With such a device, either make the content itself at the wall's size, or add a processor with scaling - do not expect the software to conjure it up.

Pass: Circles are undistorted, all four corners are visible, and the whole image is displayed complete; final settings saved as a preset.

Chapter 10

Playback Settings

Once configuration is done, the wall is simply a large monitor: whatever is plugged into the processor's input is what the wall shows.

1. **Select the input source**
   After connecting the signal source (computer) to the processor by HDMI, press the front-panel button for that input to select it. Wrong source selected means a dark screen - that is not a cabling fault.

2. **Set the Windows display mode**
   Press Windows + P: use Duplicate for the first test - the LED wall and the computer show the same desktop, which is the least error-prone. With Extend, the LED wall is a separate desktop: drag the player window onto the LED desktop, then go full-screen.

3. **Check external display parameters**
   Resolution and refresh rate must be supported by both the computer and the controller; once the image is stable after changing, keep the change.

4. **Playback test**
   Play a local test file first. Keep the laptop plugged in and turn off sleep and notifications; where sound is needed, test the sound separately.

5. **ViPlex Express users**
   Set the playback window resolution to match the LED screen, add the video file and adjust the playback area, and it will display full-screen in sync.

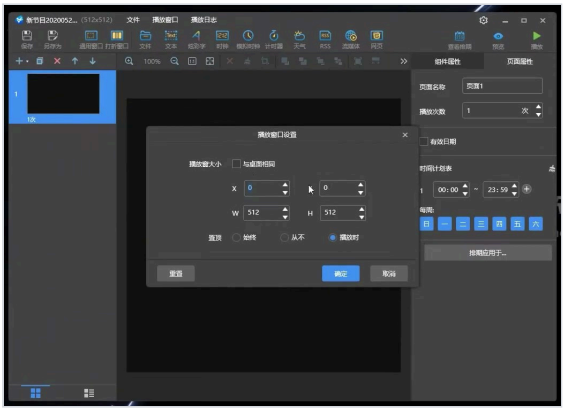

Figure 25 - ViPlex Express playback window settings (Chinese interface, original screenshot): keep the playback window X and Y at 0, and enter W and H as the LED screen's pixels, so the playback window resolution matches the LED screen. (Chinese interface, original screenshot)

For a screen whose configuration file has already been prepared by the customer, at this point you only need to: power on in the Chapter 11 sequence, select the input source, and check playback per this chapter - there is no need to redo the Chapter 7 and 8 configuration.

> **Common mistake:** If the wall shows only the desktop wallpaper, the player has probably not been dragged onto the extended desktop - do not touch the RCFG; full-screen on the laptop screen does not move to the LED output by itself.

> **Pass:** The selected video plays complete on the LED wall; sound is normal where sound is required; no missing cabinets and no flicker during playback.

Chapter 11

Save, Store to Hardware and Final Checks

Save only when you are satisfied with the result. Saving is what stores the configuration into the hardware - after a power-off restart, the configuration must still be there.

1. **Save and back up**
   After Send to HW, click Save; store the RCFG file (the Save to File copy) together with the screen connection and system backups on the computer, in the same folder as the final wiring diagram.
2. **Restart verification**
   Restart in order: signal source, then controller, then wall power branches. Verify the parameters are still there after a power-cycle restart. Do not get into the habit of reinstalling the RCFG at every start-up - that means the save was not done properly.
3. **Low-brightness colour test**
   Show red, green, blue, white, black and grey scale in turn, at low brightness first to check uniformity. Do not leave a full-white high-brightness image on for long.
4. **Spatial order test**
   Play a numbered grid image and an image with corner marks (top-left / top-right / bottom-left / bottom-right): text and lines must not break, repeat or flip blocks as they cross cabinet seams.
5. **Video test**
   Play a moving video and check for missing cabinets, unstable input or visible flicker.
6. **Finish with labels**
   Label all cables and ports - when the screen is later dismantled and reinstalled, the labels let you reconnect it exactly. Save the NovaLCT project file and photograph the finished installation for the record.



Figure 26 - Store operation (Chinese interface, original screenshot): after the screen connection is fully connected and sent to the hardware, click Store in the receiving card and screen connection interface to write the configuration into the hardware.



Figure 27 - The wall back to normal: after restoring the correct receiving card file, all cabinets display normally again (green test image in the figure); only when the result is satisfactory and the display is normal do you save and store to hardware as in this chapter.

First start-up sequence (follow this order at every start-up)

Order	Action
1	Turn on the signal source (computer) and confirm the desktop is normal
2	Turn on the controller and select the correct input source on the front panel (wrong source = dark screen; check here first)
3	Close the wall power branches one by one, starting at low brightness / black field
4	For an already-configured screen: read back and confirm the backup first, then do the playback test - do not reconfigure from scratch

> **Pass:** One complete image fills the whole wall; still correct after a restart; backup files, test records and installation photos archived; all cables and ports labelled.

Chapter 12

Troubleshooting (Part 1): By Symptom

Start with the most likely cause for the symptom - do not reinstall the RCFG at the first black screen.

Symptom	Check first	Then check
No image / black screen	Whether the input source is selected correctly (no DVI selected = black screen); whether the power branches have power	Control cable and USB driver; whether the mapping has been sent and saved
Scrambled image or no signal	Whether cabling order and mapping order agree cabinet by cabinet (a wrong order means a scrambled image or no signal)	Whether the correct RCFG was used; whether a data port is on the wrong chain
Only part of the image is shown	Processor output width/height: width = columns x cabinet width, height = rows x cabinet height (page 17)	Whether the mapping rows/columns match the actual wall
Only repeated blocks appear	Mapping (do not keep reinstalling the RCFG)	Whether the start coordinates have been reset (page 14)
One cabinet black or a dark area	That cabinet's power: is there power at AC IN, is AC OUT chained correctly; and that cabinet's upstream and downstream neighbours in the signal chain	That cabinet's receiving card parameters; a single failed power supply inside a 500x1000 cabinet can also cause a black screen or uneven brightness (replacement by trained personnel)
Single dead pixel	Module replacement (page 22)	Whether the spare module's model, batch and calibration match its neighbours

Two common misjudgements - remember them first: **Only part of the image is shown** means the output width/height is not set correctly, not a mapping error; a **a black screen from selecting the wrong input source** is not a cabling fault. Rule these two out first and you will save most of your troubleshooting time.

Chapter 12 (continued)

Troubleshooting (Part 2): Troubleshooting Discipline

Before changing any configuration, set three rules

1. **Back up first, then change**
   Before changing any configuration, save a copy of the current working configuration (Chapter 11). Change without a backup and there is no way back if you break it.

2. **Change one thing at a time**
   Change one item, test once, record the result. Change three things at once and, if it works, you will not know which one did it - and if it fails, you will not know where to step back to.

3. **Eliminate in order**
   Power, input source, signal chain, mapping, output width/height, RCFG. This order runs from the most common, cheapest causes to the least common, most expensive - do not work through it backwards.

What you see, what to think of first

What you see	Next step
Whole wall black, but the controller panel lights are normal	Check input source selection and wall branch power supply
The wall is lit but does not form one image	Check that mapping order and cabling order agree (pages 15-16)
The image is complete but occupies only part of the wall	Check processor output width/height (page 17)
Every cabinet shows the same top-left piece of the image	Check whether the start coordinates were reset (page 14)
Only one section of cabinets is dark or black	Check this section's power branch and the entry cabinet of its signal chain
Configuration lost after a restart	Check whether Save in Chapter 11 was really executed; save again and restart to verify

Write the troubleshooting record in the remarks column of the Job Sheet: the symptom, what you changed, and the result. When the same wall has a problem a second time, this record is the fastest clue. If you really cannot locate the fault, send photos of the symptom, the wiring diagram and the configuration file to Bluestar technical support (WhatsApp: +86 155 7321 7152) - do not keep changing things blindly.

> **Pass:** The fault has been located to one specific link (power / input / chain / mapping / output / configuration file) and repaired; the whole wall retested successfully afterwards; the troubleshooting process recorded.

Chapter 13

Module Replacement and Maintenance Points

A dead pixel means replacing a module, not a whole cabinet. Cut the power first, then start work.

1. **Confirm the removal method first**
   First confirm how this cabinet's modules are removed (front magnetic / rear screws, etc.); isolate the power and verify it is dead before you start.

2. **NEW Use the arrow to set direction**
   The magnetic module's back has a small arrow marking the correct installation direction; refit it in the arrow direction. The module attaches to the cabinet front with magnets and needs no wiring, so replacement is quick. The number of modules follows this model's cabinet structure - do not copy another brand's modules-per-cabinet count.

3. **Support it while removing**
   Support the module while removing it so it does not drop; photograph the original connector positions as a record; do not pull on the LED lamps or on cables.

4. **Spares must match exactly**
   Pixel pitch, module size, scan mode and driver IC, interface, batch and calibration requirements - all six must match the neighbouring modules. A spare that does not match will show different colour and brightness from its surroundings once installed.

5. **Refit and retest**
   Connect with power off, restore the fixings, take care not to trap cables; restore seals and covers. After powering on, check flatness and colour against adjacent modules one by one.



Figure 28 - Close-up of the small arrow on the module back: the arrow is moulded into the module back; when refitting, install in the arrow direction; the module attaches to the cabinet front with magnets and needs no wiring. Hold a module by its frame or handle. Do not touch the LED face.

Receiving cards and power supplies are replaced by trained after-sales personnel and are outside this chapter's scope; after replacing any part, return to Chapter 11 and run the colour and order tests again.

> **Pass:** The new module is flat, its colour matches its neighbours with no visible difference; seals and covers restored; whole wall retested successfully.

Appendix A

Key Numbers Quick Reference

Power and branches (220 V)

Item	Value
Branch breaker / margin	16 A, with 20% margin, about 2816 W usable per branch
500x1000 cabinet	Max 300 W/cabinet; max 9 cabinets per branch; 2 x 200 W power supplies in parallel inside, sharing 1 AC input
500x500 cabinet	Max 150 W/cabinet; 18 cabinets per branch (estimated from 150 W, to be confirmed by an electrician); 1 x 200 W power supply inside
960x960 fixed cabinet	Approx. 553 W/cabinet; 3 x 200 W power supplies inside (estimated from power; the nameplate governs); branches calculated by the electrician from measured values
Example	4x3 m P3.91 wall: 24 cabinets, max 7.2 kW, 3 branches in total (3 branches x 8 cabinets)

Signal and processors

Item	Value
Load limit per port	650,000 pixels/port
Single-port area (zone)	P3.91 approx. 9 m2 - P2.9 approx. 5 m2 - P2.6 approx. 4 m2 - P5 approx. 16 m2
Pixel density	P3.91 65,536/m2 - P2.9 112,896/m2 - P2.6 147,456/m2 - P5 40,000/m2
Processor	CMS130 2 ports/1.3M - CMS260 4 ports/2.6M - VX600 PRO 6 ports/3.9M - VX1000 PRO 10 ports/6.5M - VX2000 PRO 20 ports/13M
Cable length division	Vertical connections use 1.2 m cables; horizontal connections use 85 cm cables (500x500 cabinets use only 85 cm cables, 960x960 cabinets use only 1.2 m cables)
Cables for the 4x3 m example	Per port: 8 x 1.2 m cables + 3 x 85 cm cables; whole wall: 16 x 1.2 m cables + 6 x 85 cm cables, plus 1 cable per port from the processor to the first cabinet

Common models (selection; the full table is the order's model table)

Model	Cabinet	Pixels per cabinet	Weight	Max power
P3.91 outdoor	500x1000	128x256	15 kg	300 W
P3.91 outdoor	500x500	128x128	7.5 kg	150 W
P3.91 indoor	500x1000	128x256	15 kg	300 W
P2.9 outdoor	500x1000	168x336	15 kg	300 W
P2.6 indoor/outdoor	500x500	192x192	7.5 kg	150 W
P5 outdoor fixed (steel cabinet)	960x960	192x192	28 kg	Approx. 553 W

Cabinet resolution x cabinet count = whole-wall canvas pixels: wall width in pixels = cabinet width in pixels x columns, wall height in pixels = cabinet height in pixels x rows (needed in Chapter 9).

Appendix B

Glossary (English and Spanish)

English	Español	Description
Cabinet	Gabinete	The basic unit of the wall
Module	Módulo	The board carrying the lamps
Receiving Card	Tarjeta receptora	One per cabinet; receives data and lights pixels
Sending Card	Tarjeta emisora	Converts the image into data and sends it to the cabinets
Video Processor	Procesador de video	Receives the signal source, scales and outputs
Mapping / Screen Connection	Mapeo / Conexión de pantalla	Sets each cabinet's position and order
RCFG File	Archivo RCFG	Module drive and load parameters
Save / Store to Hardware	Guardar / Fijar en hardware	Configuration written into the hardware; not lost at power-off
Scaling	Escalado	Fits the image to the wall's size
Zone / Port Load Area	Zona / Área por puerto	The area served by one data port
Snake / Serpentine Routing	Recorrido en serpiente	The chain folds back and forth
Daisy Chain	Conexión en cadena	The cabinet-by-cabinet chained connection method
Hanging Bar	Viga de suspensión	The horizontal bar cabinets hang from when rigged
Flight Case	Flight Case	Cabinet transport packaging
Job Sheet	Hoja de trabajo	This order's installation data record (page 26)

Button names in the software interface follow NovaLCT's original English names (e.g. Send to HW, Save to File); this manual keeps the original English names in the text with an English explanation.

Appendix C

Handover Checklist

Handover Checklist (before handing over to the customer or the next crew)

[ ] Whole wall retested lit, photos taken and archived

[ ] RCFG file, screen connection backup and NovaLCT project file handed to the customer, with storage location explained

[ ] Final wiring diagram (power branches + signal routing) archived with the Job Sheet

[ ] All cables and port labels complete

[ ] Spare modules, spare power supplies and spare receiving cards counted and handed over

[ ] Start-up sequence (page 19) demonstrated once to the customer's operators

[ ] Installation Record and Sign-Off page (page 27) completed

Appendix D

Job Sheet

Fill in the top part before starting and the bottom part when finishing. One sheet per order, archived with the goods.

Order and wall data

Customer / project		Invoice number	
Model / pixel pitch		Indoor / Outdoor	
Cabinet size		Batch	
Wall size (L x H, m)		Area (m2)	
Cabinet grid (columns x rows)		Total cabinets	
Pixels per cabinet (W x H)		Whole-wall pixels (W x H)	
Installation method		Hanging bar (size / quantity)	

Electrical and control data

Site voltage		Number of power branches	
Cabinet numbers on each branch			
Processor model / quantity		Data port allocation	
Routing method (snake / one port per row)		Input source name	
RCFG file name		Backup storage location	
Output width/height setting		Scaling / preset name	

Finishing record

Restart verification (configuration still present)		Colour / order test	
Labels complete		Installation photos archived	
Remarks (write the troubleshooting record here)			

Finishing

Installation Record and Sign-Off

Project / Customer	
Installation location	
Installation date	
Wall specification (model / size / cabinet count)	
Person in charge of structural installation (signature)	
Electrical inspector (signature)	
Commissioning lead (signature)	
Customer confirmation (signature)	

Delivery notes

This manual is delivered together with: this order's RCFG file and configuration backup, the final wiring diagram, and the completed Job Sheet (page 26). For later use and playback operation, see the LED Display User Manual.

Technical support: Bluestar Opto Limited - Website www.bluestaroptolimited.com - WhatsApp +86 155 7321 7152. When contacting us, bring the invoice number, photos of the symptom and this order's wiring diagram - diagnosis will be much faster.

> **End of manual.** To recap the order for building a wall: inspect the goods (Chapter 1), build the wall (Chapter 2), power (Chapter 3), signal (Chapter 4), connections (Chapter 5), software (Chapter 6), configuration file (Chapter 7), mapping (Chapter 8), output (Chapter 9), playback (Chapter 10), save and finish (Chapter 11). Only when every chapter's Pass box is satisfied is the wall finished.