HOW TO INSTALL THE GRIT LASER TRIGGER ON BOSS LASERS

How to Install the GRIT Laser Trigger on BOSS Lasers

Document ID: IG-TRIG-BOSS | Revision: 1.3 draft | Updated: October 2026

Draft: This wiring has not yet been tested on a laser. Check the controller model, Trigger version and cable connections before use.

The BOSS controller can tell the GRIT Laser Trigger when a job is running or paused. This guide covers LS-1420, LS-1630, LS-2440 and LS-3655 lasers with the Ruida terminals shown below and a **GRIT Laser Trigger with a 24 V signal input**.

Short version: Connect CN1-6 (+24V) directly to the RCA center contact, GRIT EXT-RUN. Connect the outer shell, GRIT EXT-GND, to CN1-4 (STATUS). Leave the existing indicator connected. Select **Low Voltage Signal** in the app, then test the connection. The Trigger will still show running while a job is paused.

BEFORE YOU BEGIN

Have a qualified installer check the controller model, terminal labels and Trigger version. BOSS has used different controllers, so check the labels on your machine against the pictures. The pictures come from the manufacturers' manuals; your cabinet may look different.

Install the GRIT Hub and connect the Trigger's power supply according to its label and instructions. This guide covers the running-signal cable. Follow separate instructions for any AC wiring, plug changes or E-Stop connection.

Gather the parts and tools

Per laser	Required item
1	GRIT Laser Trigger with a 24 V signal input
1	Male RCA plug-to-two-wire sensing cable for the pictured AV-5 jack
As needed	Rated insulated branch terminals, heat-shrink insulation and cable strain relief
Tools	Circuit-rated meter, continuity tester, suitable terminal screwdriver and cable termination tools

You will need a sensing cable if one was not supplied with your Trigger. No additional relay or interface is needed for the 24 V input version.

Check the signal input rating: Use the 24 V signal-input version of the GRIT Laser Trigger for this connection. Do not connect 24 V to an input rated for a lower voltage. Contact GRIT if you are unsure which version you have.

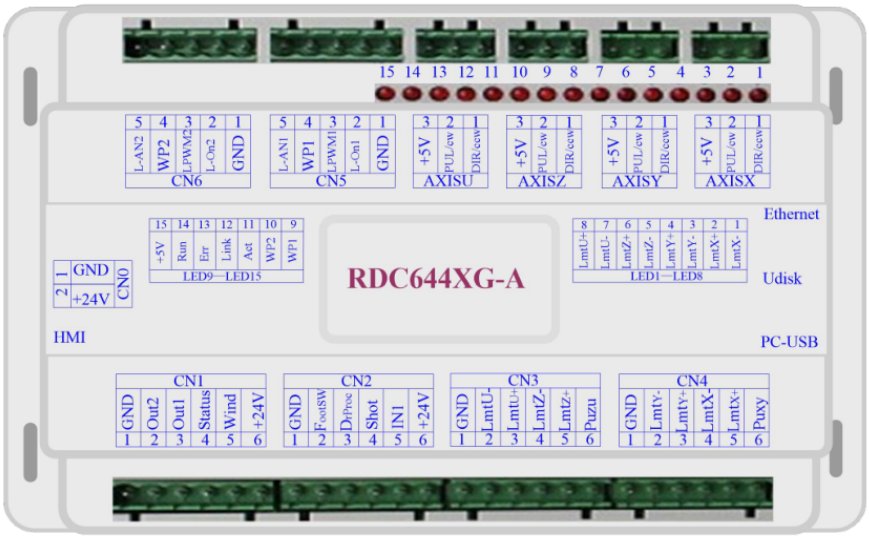
STEP 1: FIND THE CONTROLLER TERMINALS

1. Shut down the laser and lock out its power. Follow the machine and facility procedures to check that all hazardous energy has been isolated before opening the electrical compartment.

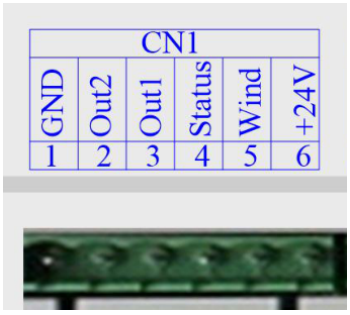
2. Locate the motion controller and read its model and terminal labels.

3. Find the CN1 block labeled GND, Out2, Out1, Status, Wind and +24V.

4. Identify **terminal 4, STATUS**, and **terminal 6, +24V**. Match both the numbers and labels to the reference picture.



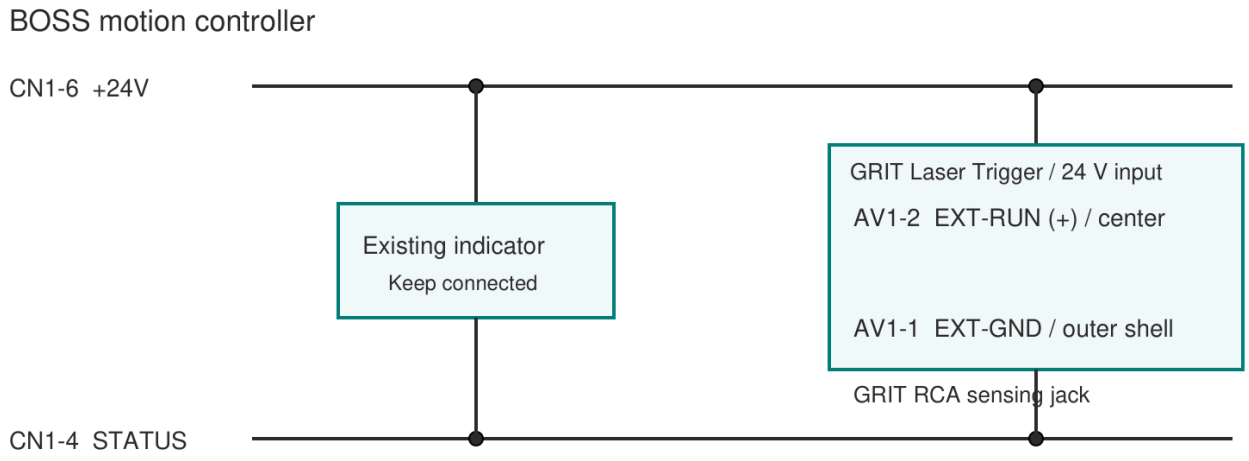
Original Ruida Figure 3.1-1, PDF page 15 / printed page 8. The close-up shows the two connection points among CN1's six terminals.



+24V is the positive supply. STATUS switches the return wire. The existing BOSS indicator is connected between these two terminals. STATUS is not a second positive supply or a voltage-free contact.

Use the motion controller's CN1, not the separate six-pin laser power-supply connector. Leave door, chiller and other protective interlocks intact. Cabinet access panels vary.

STEP 2: CONNECT THE SENSING CABLE



Keep the original indicator connected. EXT-GND returns to STATUS.

Connect from	Connect to
BOSS CN1-6, +24V	RCA center contact: GRIT AV1 pin 2, EXT-RUN
RCA outer shell: GRIT AV1 pin 1, EXT-GND	BOSS CN1-4, STATUS

1. With power off, identify the wire connected to the **RCA center contact: AV1 pin 2, EXT-RUN**, and the wire connected to the **outer shell: AV1 pin 1, EXT-GND**. Use a continuity tester to check which wire goes to each contact; do not rely on wire colors.

2. Connect CN1-6 (+24V) directly to the EXT-RUN wire.

3. Connect CN1-4 (STATUS) to the EXT-GND wire.

4. Leave the original indicator connected. Use connectors rated for the wire and circuit. Only put two wires under a terminal clamp if the connector allows it.

5. Plug the cable into the GRIT **RCA sensing jack, AV1**. The separate DC3 power connector is not the sensing input.

6. Check the polarity, insulation, wire connections and strain relief. Secure the cable so pulling on it cannot loosen the connections. Close the cabinet before turning the power back on.

Keep the existing controller plug if it is in good condition. If it needs replacing, match the replacement to the fitted connector; the manual does not give its exact pitch or part number. Older GRIT Triggers can also have different connectors.

Connect the return wire to STATUS: EXT-GND connects to STATUS in this circuit. Do not connect it to the laser's GND terminal or GRIT logic ground.

STEP 3: SET UP THE TRIGGER IN THE APP

1. Bind the Trigger to your Hub using the Hub's binding instructions. Find it in Devices and check that you have selected the right Trigger.

2. Open **Devices > Trigger > select the Laser Trigger**.

3. Set **Activation Method** to **Low Voltage Signal**.

4. Set **Low Voltage Activation** to **High** for this circuit. Voltage at the Trigger input means a job is running or paused.

5. Close and reopen the Trigger page to check that the settings were saved.

6. Check that the correct collector and gates are assigned to this laser.

These setting names are from Hub v1.1.1089. High refers to voltage across the GRIT input; STATUS itself switches the return wire. The Momentary/Latching setting is only for E-Stop Triggers. Selecting Both would require current sensing as well as the running signal.

STEP 4: TEST THE CONNECTION

With the cabinet closed and people clear, operate the laser using its normal controls. Watch the existing indicator and check the Trigger's status in the app.

Laser status	What the Trigger should show
Powered on, no job active	Trigger idle
Job processing	Trigger running; the Hub starts the assigned exhaust according to its settings
Job paused	Trigger remains running because STATUS remains active
Job stopped or completed	Trigger returns to idle; exhaust follows its configured run-on timing

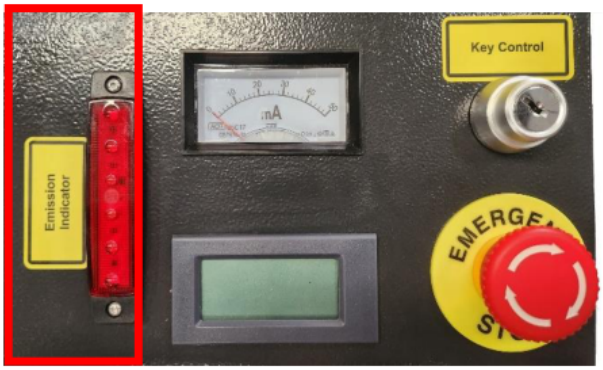
Record what happens in each case. STATUS stays active while a job is running or paused, so it does not tell you whether the beam is firing at that moment.

If it does not work

Symptom	Check
Always idle or always running	Check that you selected the right Trigger, Low Voltage Signal and High in the app. With power off, check the controller model, terminal labels and cable connections.
No response to a job	Check that the Trigger has a 24 V signal input. Check the CN1-4/6 labels, plug, cable connections and polarity.
Indicator behavior changes after wiring	Isolate power and inspect the new branch for a short or incorrect return connection.

Symptom	Check
Runs during pause	Expected for this STATUS signal.
Trigger changes state but exhaust does not	Check which collector and gates are assigned to the Trigger, along with their delay settings.

SEE THE ORIGINAL BOSS INDICATOR PICTURES



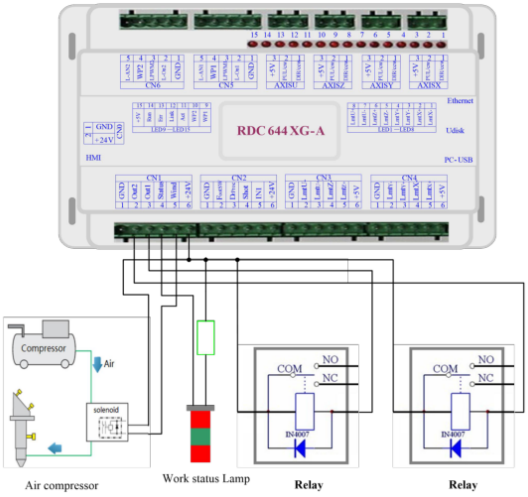


From the BOSS LS manual, PDF page 19 / printed page 17, document 855-901, revision 006. The red boxes are in the original. For clearer terminal labels, use this guide's close-up and wiring table.

CHECK THE ORIGINAL RUIDA DEFINITIONS AND DIAGRAM

Pin	Symbols	Definitions
4	Status	General output, working status signal port, external relay, when the system is processing or pausing, the relay coil conducts; When the system is idle, the relay coil closes. This interface can also be used to connect the running indicator light of the three color light.
6	+24V	24V Power positive output

These are the STATUS and +24V rows from the Ruida CN1 table, PDF page 22 / printed page 15.



Original Figure 7.2-1: Ruida output wiring, PDF page 35 / printed page 28. The GRIT connection does not need a relay. Controller layout: PDF page 15 / printed page 8. This Ruida manual is hosted on a third-party site.

RELATED ARTICLES

- Install the GRIT Laser Trigger
- GRIT documentation library

Revision 1.3 draft, October 22, 2026: Wiring instructions for the 24 V input version. Center = pin 2, EXT-RUN; shell = pin 1, EXT-GND. Original manual pictures retained.

Still stuck? Email support@gritautomation.com.