



SAPPHIRE

Er:YAG Dental Laser System

QUICK START GUIDE



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1 Setup & Power On

Pre-Start Checklist

- ☑ Internal water coolant filled with DI/distilled water (between MIN–MAX)
- ☑ Emergency Stop button released
- ☑ Applicator connected (handpiece + mirror + tip installed)
- ☑ Power cord plugged into grounded outlet
- ☑ Footswitch connected (wireless dongle or wired)
- ☑ Safety interlock key inserted

Fill Spray Water Bottle

Remove bottle from console top → Fill with DI/distilled water to MAX line → Reinsert firmly.



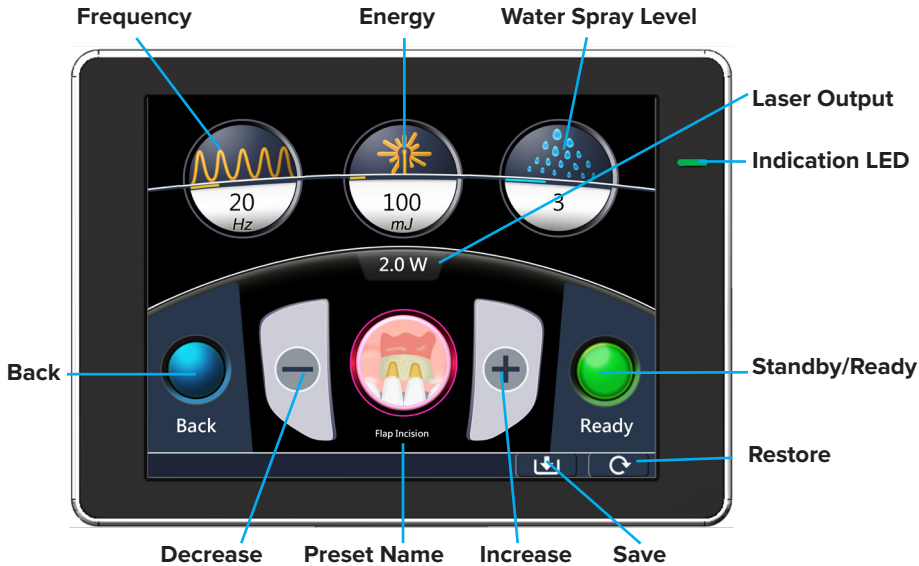
Use only deionized or distilled water. Tap water causes mineral buildup.

Power On

1. All appropriate personnel have laser safety eyewear (2940 nm)
2. Insert key → Turn clockwise to ON
3. Wait for start screen and air pump initialization to complete

EMERGENCY STOP: If an unexpected condition occurs, immediately press the Emergency Stop button. Contact your distributor or service provider.

2 Controls & Treatment Selection



LED Indicator

- Green = Ready
- Orange = Standby
- Red = Warning
- Red Flashing = Error (see codes on back cover page)

Select Treatment Mode

From the main screen, choose Hard Tissue or Soft Tissue. Tap a procedure preset, then adjust Hz, mJ, and Water Level as needed. Press Standby → Ready to enable the footswitch.

Control	Function	Control	Function
Frequency (Hz)	Pulse repetition rate	Standby / Ready	Disable / enable laser
Energy (mJ)	Energy per pulse	Save	Save current parameters
Water Level (1–8)	Cooling spray intensity	Restore	Reset to factory defaults
Laser Output (W)	Calculated output power	+ / -	Adjust selected parameters

3 Maintenance & Shutdown

After Each Use

Supplies: 75% ethanol alcohol, lint-free wipes (Kimtech® or equivalent), powder-free gloves.

Procedure for each component

Laser Tips - Wipe both input and output faces with alcohol. Inspect under light. Place on the tip holder. Replace if chipped, cracked, or residue won't clean.

Handpiece Mirror - Remove with hex tool. Wipe reflection surface with alcohol. Replace if scratched, stained, or damaged. DO NOT AUTOCLAVE.

Nozzle - Run Desensitization mode (10 Hz / 10 mJ / Water 8) for 30 sec. Clean spray water openings with endodontic file. Run 30 sec again. Replace if blocked or O-rings damaged.

Handpiece - Wipe with alcohol. Wrap in autoclave pouch (without mirror).

Shutdown Procedure

1. Remove tip → clean per above → place on tip holder
2. Remove handpiece & mirror from applicator → clean mirror → store mirror safely (do not autoclave).
3. Dock applicator on holder → cover with protective cap
4. Turn key counterclockwise to OFF
5. Sterilize handpiece and tips (in tip holder)



Parameter	Specification
Minimum Sterilize Time	22 minutes
Recommended Drying Time	30 minutes
Sterilization Temperature	121°C (250°F)

 **CAUTION:** Do not exceed 135°C (275°F). Excessive temperatures may damage the handpiece and optical components. **DO NOT AUTOCLAVE THE MIRROR**

4 Built in Protocols

Hard Tissue

Higher energy with maximum water spray for enamel, dentin, and bone procedures.

Protocol	Hz	mJ	Water	Tip(s)	Application
Enamel / Crown Removal	20	350	6	ST100	Cavity prep, enamel etching
Dentin Removal	20	250	6	ST100	Cavity prep on dentin
Caries Removal	20	200	6	ST100 / ST220	Selective caries excavation
Open Chamber	15	400	6	ST100	Endodontic access prep
Laser Etching	30	200	6	ST100 / ST120	Surface etching for bonding
Ostectomy	30	150	5	ST100 / ST200	Bone cutting / removal
Osteoplasty	30	100	5	ST100 / ST200	Bone contouring / reshaping
Scaling & Root Planing	15	100	6	ST100 / ST700	Calculus removal, root debridement
Desensitization	10	10	0	ST100 / ST120	Dentin hypersensitivity treatment
Apex Cutting	20	300	6	ST100 / ST220	Apicoectomy root-end resection

Soft Tissue

Lower energy with reduced/no water spray for precise cutting and coagulation.

Protocol	Hz	mJ	Water	Tip(s)	Application
Flap Incision	20	100	3	ST240 / ST700	Soft tissue flap creation
Implant Decontamination	10	150	6	ST100 / ST700	Peri-implantitis treatment
Implant Uncovering	20	100	2	ST220 / ST240	Stage 2 implant exposure
Operculectomy	25	150	3	ST100 / ST120	Tissue removal over erupting tooth
Frenectomy	25	100	3	ST200 / ST240	Frenum excision
Oral Ulcer LOW	20	20	0	ST100	Aphthous ulcer treatment
Coagulation	20	30	0	ST100	Hemostasis
Pocket Debridement LOW	10	50	6	ST240	Sulcular debridement
Gingival Depigmentation LOW	30	50	2	ST100	Melanin pigment removal
Crown Lengthening	30	100	3	ST200 / ST240	Soft tissue crown lengthening

5 Warnings & Error Codes

If any warning or error persists after corrective action, turn off the system and contact your provider.

Low Spray Water Warning

When the LED turns red and the low water icon appears: Switch to Standby → Remove bottle → Refill with DI/distilled water to MAX → Reinsert and resume.



Code / Warning	Probable Cause & Action
Error 01	Applicator not detected. Verify applicator is securely connected.
Error 02	Flash lamp / discharge circuit failure. Contact authorized service.
Error 06	Cooling water low or pump malfunction. Check internal coolant level.
Error 10	System board malfunction. Contact authorized service.
Interlock	Safety interlock not properly seated. Ensure connector is fully inserted.
Overheat	Extended continuous use. Allow system to cool before resuming.



Scan for
instructional
videos



For complete operating instructions, safety information, and technical specifications:
SAPPHIRE Operator's Manual (SA-OM-01)

SA-OM-02-A6



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