

BW10-907B and BW10-908B Swept-Source Optical Engine Interface & Operating Instruction

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1. Executive Summary

This specification describes the electrical and serial interface, command set, operational procedures, and safety considerations for the BW10-907B and BW10-908B VCSEL swept-source optical engine. The document includes connection diagrams, example terminal configuration, command reference tables, and error/safety guidance for laboratory and system-integration personnel.

2. Serial Connection (Host Terminal)

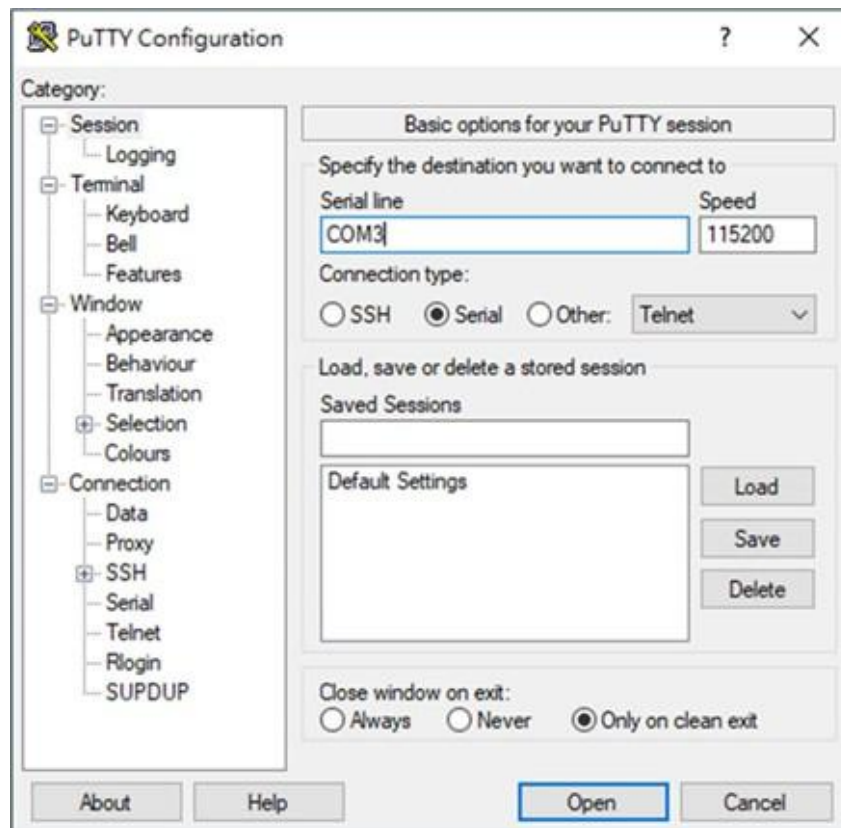
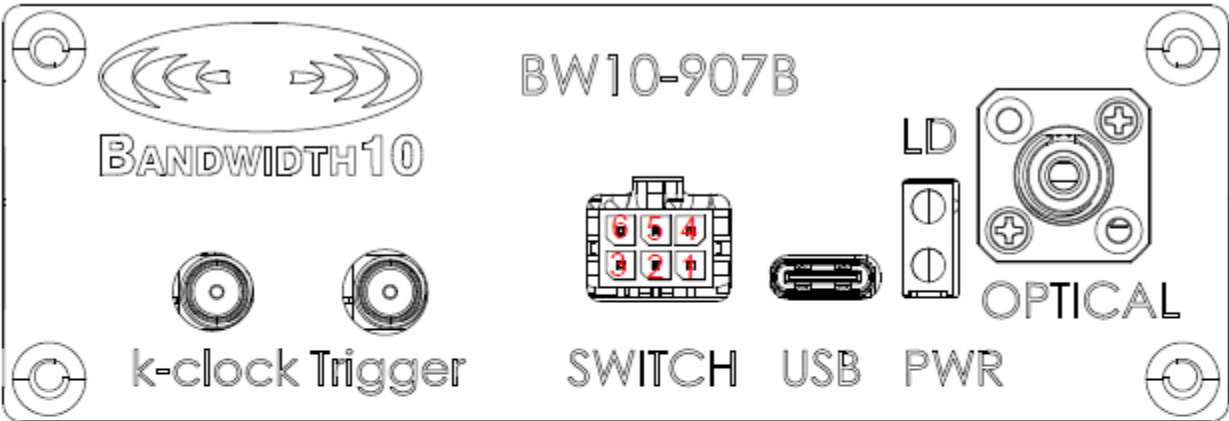


Figure 1 — Example PuTTY configuration for connecting to the BW10-90xB virtual COM port (e.g., COM3, 115200 baud).

Notes: Use a terminal emulator (PuTTY, Tera Term, or similar) selecting 'Serial' as the connection type. Verify the COM port number in Windows Device Manager and set the baud rate to 115200 (unless otherwise specified by the product).

3. Hardware Interface Layout example



Switch pin define

- pin 1: SW enable
- pin 2: Interlock
- pin 3: Status
- pin 4: +3.3V
- pin 5: +3.3V
- pin 6: GND

Figure 2 — Rear panel: Optical output, MZI output, Trigger, I/O interface, USB-C and status indicators. I/O pin mapping shown below.

4. I/O Interface Pin Mapping

Pin / Color	Signal
Pin 6	GND
Pin 5	+3.3V Output
Pin 4	+3.3V Output
Pin 3	Status
Pin 2	Interlock Control
Pin 1	SW enable

5. Quick Start Checklist

Step	Action / Details
1	Connect power supply to the BW10-90xB engine. Verify power LED and status.
2	Connect USB-C to host computer. Confirm virtual COM port appears in Device Manager.
3	Connect I/O interface lines: Laser Emission Control → +3.3V (enable), Interlock Control → +3.3V (normal).
4	Open terminal emulator, select Serial, set COM port (e.g., COM3) and baud = 115200.
5	Type '?' to list available commands. Use 't' to enable optical output, 'u' to disable.
6	Verify LD status via command 'D' or monitor I/O output pin (yellow).

6. Command Reference — Read Functions

Command	Description	Example Response / Notes
?	Display supported commands.	Shows usage list
A	USB connection status.	USB: CONNECTED / DISCONNECTED
B	Part number and serial number.	PN: BW10-907B-30-30 SN: S2210R0009
C	Firmware and hardware versions.	SYSFW: 0.22 SYSHW: 2.30
D	Laser status (on/off/interlock).	LDSTAT: D0/D1/D2
E	Laser sweep rate and waveform.	SRATE: 30kHz DESC: sine
F	Cumulative laser ON time (minutes).	ONTIME(MIN): 8588
G	Cumulative laser ON time (D/H/M).	ONTIME: 5Days, 23Hours, 8Mins
H	Read error codes.	Error Code: 0x00 or specific E##
J	Current setting number.	CSET: 1
K	Default (power-on) setting number.	PSET: 1
P	Laser monitor (LD voltages, currents, temps, tuning voltages).	See detailed response example
Q	SOA monitor (bias, temps, TEC currents).	V_SOA, I_SOA, TEMP_SOA, etc.

7. Command Reference — Control Functions

Command	Action	Notes / Warnings
r	Reboot / Initialize the engine.	Safe to use; engine will restart
t	Turn on laser optical output.	Will fail if interlock disabled
u	Turn off laser optical output.	Immediate shutdown of optical emission
v	Decrease trigger delay.	Adjust in small increments
w	Increase trigger delay.	Adjust in small increments
x	Change laser driving frequency.	Use with caution—affects sweep rate
1–9	Select preset configuration.	Load saved preset if available

8. Advanced / Password-Protected Commands

Command	Function	Caution
s	Enter password (enable protected mode).	Required before tuning commands
i	Increase DC tuning voltage (step = 0.05 V).	Excessive VDC may damage laser
j	Decrease DC tuning voltage (step = 0.05 V).	Keep within manufacturer limits
k	Increase tuning Vpp (step = 0.1 V).	Affects sweep amplitude
m	Decrease tuning Vpp (step = 0.1 V).	Affects sweep amplitude
z	Save current laser settings to non-volatile memory.	Use after verified configuration

9. Error Codes & Automated Alerts

Error Code	Meaning / Recommended Action
0x00	No error.
E01	Power supply not connected. Action: Connect power and restart engine.
E02	Auto-restart pattern generator triggered. Action: Monitor and contact support if recurring.
E04	Laser temperature unstable. Action: Allow thermal stabilization; check cooling/ambient.
E08	SOA temperature unstable. Action: Allow thermal stabilization; verify TEC operation.

10. Safety and Handling

Key Safety Notes:

- Ensure interlock and emission control lines are connected and tested before enabling optical output.
- Do not modify tuning voltages or V_{pp} unless authorized and trained; these parameters can permanently damage the laser.
- Monitor LD and SOA temperatures continuously during operation; implement automatic shutdown on out-of-range conditions.
- Use appropriate laser eyewear and follow local laser safety regulations for the applicable laser class.
- If an error code persists after corrective action, contact Bandwidth10 support with engine PN/SN and firmware version.

11. Product Specification Note & Support

This document provides interface and operational guidance. For full electrical schematics, mechanical drawings, detailed timing diagrams, and regulatory safety documentation, refer to the formal product specification packet or contact Bandwidth10 support: support@bandwidth10.com (replace with actual support contact).