

The CS1201 Code Simulator is an easy to use training tool for practicing defibrillation, external pacing, and arrhythmia recognition. Connect directly to defib/pacer for safe simulation of cardioversion and electrical capture. The CS1201 generates fibrillations, tachycardias, and bradycardias, as well as ST segment and T wave abnormalities.

ON-OFF

LOW BATT

DEFIB DSCHG

convert

PACER PULSE

capture

VF

VT-HI

VT-LO

T de P

AFIB

AFLTR

PSVT

S TACH

ANT ST↓

NSR

ASYS

SINUS AMI

SINUS AMI PVC

SINUS ANT-S ST↑

2nd I LAT ST↑

S BRDY INF ST↑

S BRDY IMI

1st RBBB

2nd II LBBB PVC

2nd II LBBB

3rd

CS1201
CODE SIMULATOR

ON-OFF

Press to power-on and to power-off.

LOW BATT

Red indicator illuminates when battery should be replaced.

DEFIB DSCHG

Green indicator illuminates for two seconds when discharge is delivered from defib set to 50J or more.

convert

Simulate cardioversion by activating convert feature. CS1201 responds to defib discharge.

PACER PULSE

Blinks off when pacer pulse is detected.

capture

Press to select one of four pacing capture levels. Paced beats are simulated when capture occurs.

convert

The convert feature allows the simulator to convert automatically from one rhythm to another rhythm when a discharge is delivered from a defib set to 50J or more. To perform convert operation:

- Press **convert** key. The indicator of the running rhythm pulses brighter.
- Press key of the rhythm to be activated after the defib discharge. This waveform's indicator flashes on and off.
- Deliver discharge from defib set to 50J or more. The new rhythm is running.

To cancel a convert operation before it's completed, either press the convert key again, or press the key of the running rhythm. If a convert operation is started but not completed within two minutes, it will cancel automatically.

capture

The capture control allows you to select one of four pre-set pacing capture levels. Each level is indicated by the brightness of the PACER PULSE indicator. For each press of the capture key, the next higher capture level is selected. When level IV is reached, the next key press selects level I. At power-on, capture level I is selected automatically.

Capture Level	Capture occurs with pacer set at:	PACER PULSE Brightness
I	65 to 70 mA	lowest
II	75 to 80 mA	
III	85 to 90 mA	
IV	95 to 100 mA	highest

Rhythms for Defibrillator Training2

VF	Ventricular fibrillation.
VT-HI	Ventricular tachycardia. Wide QRS. Rate: 185. If simulator has CodeMaster or Heartstream pads connector, rate is 220.
VT-LO	Ventricular tachycardia. Wide QRS. Rate: 140.
T de P	Torsades de Pointes. Fluctuating QRS axis.
AFIB	Atrial fibrillation with rapid, varying ventricular response. Ventricular rate: 150.
AFLTR	Atrial flutter with 2:1 AV block. Ventricular rate: 150.
PSVT	SVT alternates with NSR, then remains in SVT. Rate: 213. PAC falls on T wave. Symmetric T wave inversion.
S TACH ANT ST↓	Sinus tachycardia with anterior ST depression. Rate: 120.
NSR	Normal sinus rhythm. Rate: 72. Selected automatically at power-on.
ASYS	Asystole.

ST segment and T wave Abnormalities

SINUS AMI	Sinus rhythm with Acute AMI. Q waves in anterior leads. ST elevation. Rate: 72.
SINUS AMI PVC	Sinus rhythm with Acute AMI and PVCs. Q waves in anterior leads. ST elevation. Rate: 72.
SINUS ANT-S ST↑	Sinus rhythm with antero-septal ST elevation. Rate: 72.
2nd I LAT ST↑	Mobitz type I second degree AV block (4:3) with lateral ST elevation. Rate varies from 40 to 50.
S BRDY INF ST↑	Sinus bradycardia with inferior ST elevation. Rate: 40.
S BRDY IMI	Sinus bradycardia with Q waves and ST elevation in II, III, and aVF. Rate: 40.

Rhythms for External Pacer Training3

1st RBBB	Sinus rhythm with first degree AV block and right bundle branch block. Wide QRS. Rate: 60.
2nd II LBBB PVC	Mobitz type II second degree AV block (4:3) with left bundle branch block and PVCs. Wide QRS. Rate varies from 32 to 65.
2nd II LBBB	Mobitz type II second degree AV block (4:3) with left bundle branch block. Wide QRS. Rate varies from 37 to 50.
3rd	Third degree AV block. Q waves in V2 - V4, but normal ST segments. Wide QRS. Atrial rate: 60. Ventricular rate: 37.

Defibrillator Exercise

Connect simulator to defibrillator. For help, see **Getting Started**, page 5.

Exercise: Convert VF to NSR.

at simulator:

- Press **VF** key. VF indicator glows steadily. Confirm VF is displayed on monitor.
- Press **convert** key. VF indicator pulses brighter.
- Press **NSR** key. NSR indicator flashes on and off. VF indicator glows steadily again.

at defibrillator:

- Select 200J using **Energy Select** switch (1).
- Press **Charge** button (2). Listen for charge ready tone.
- Press **Discharge** button(s) (3).
- After discharge observe that:
On monitor, NSR is displayed.
At simulator, NSR indicator glows steadily, and VF indicator is off.

Deliver defibrillation discharge to convert automatically.

VF NSR

External Pacer Exercise

Connect simulator to external pacer. For help, see **Getting Started**, page 5.

Exercise: Pace 3rd degree AV block at rate of 70 ppm.

To simulate paced beats, pacer **Rate** must be greater than rate of selected rhythm, and pacer **Output** must be greater than simulator capture level.

at simulator:

- Press **3rd** key. Confirm 3rd degree AV block is displayed on monitor.
- Press **capture** key once to select capture level II (75 to 80mA capture level).

at pacer:

- Select **Pacer On**. Verify sense markers are displayed with each R wave. (If not, press **ECG Size** button until R wave markers are observed.)

Continued on next page.

4. Select rate of 70 ppm using **Rate** control.
5. Press **Start/Stop** button to start pacing.
6. Using **Output** control, increase pacer current until you observe paced beats on monitor. Pacer current setting should be 75 to 80mA.

Initiate external pacing to simulate paced beats.



3rd degree AV block

Paced beats at 70 ppm

IBP Waveform Option

The IBP waveform option allows viewing of invasive blood pressure waveforms on an IBP monitor. CS1201s with this option have a blood pressure cable and connector attached to the end panel. When NSR is selected, blood pressure is approximately 120/80 mmHg. When either VF or Asystole are selected, blood pressure is zero. The remaining 17 rhythms have associated blood pressures that can be classified as hypertensive, hypotensive, or normotensive.

To zero your IBP monitor:

1. Connect monitor's IBP cable to the CS1201's IBP cable.
2. Power-on the CS1201.
3. Select ASYS.
4. Power-on the IBP monitor.
5. Complete zeroing procedure as described in your monitor's operating instructions.

Specifications

sensitivity: 5 microV/V/mmHg; input impedance: 301 ohms; output impedance: 1 ohm

Battery Saver Feature

The CS1201 powers-off automatically about 30 minutes after a key was last pressed, or after defib or pacer energy was last detected. This is normal operation.

To allow simulator to remain powered-on after 30 minutes, follow these instructions:

1. Power-off simulator.
2. Press and hold down **convert** key, then press and release **ON-OFF** key. The simulator will power-on.
3. Observe the NSR indicator. When it flashes on and off, release **convert** key. NSR indicator continues to flash for about one second. The battery saver feature is now disabled. When the simulator is powered-off, it will return to normal battery saver operation.

Service

The CS1201 Code Simulator is warranted to be free of defects in material or workmanship for three years from date of purchase. If your simulator needs service, or if you have questions about its operation, please contact Symbio Corporation, or your authorized dealer.

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1. Install batteries.



Uses four AA alkaline batteries.

WARNING!

Be sure defibrillation cable is securely attached to simulator. Keep battery cover on during operation.

2. Connect defib/pacer cable to simulator.



Panel-mounted connector.



Free-hanging connector.



Panel-mounted connector.



Free-hanging connector.

3. Attach ECG cable to ECG snaps.



Limb Lead ECG snaps.



Chest Lead ECG snaps.

4. Press ON-OFF key to power-on simulator.



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