

Contents and Instructions For Use for StimLink™ Stimulator-EP Recorder Communication Link for EPS320 Cardiac Stimulator

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Please read the Micropace EPS320 Cardiac Stimulator User Instruction Manual, MP3036 in their entirety prior to installing or using this part. This User Instruction Manual leaflet (MP3159) describes the features you may derive from this StimLink™ interface option when connected between your Micropace EPS320 Cardiac Stimulator and EP recording Laboratory. The StimLink™ option does not alter the operation of the EPS320 Stimulator – all its functions appear automatically on the EP recording equipment; end users should refer to their EP recording equipment's manuals (e.g. Bard EP LS Pro User Instruction Manual).

For installation and configuration of Micropace and EP recorder equipment, refer to the separate Installation Manual (MP3100) intended for Micropace and its distributor representatives as a guide for the installation of this product.

1.1 Warnings and Precautions

- ❑ **To avoid stimulation at an undesired pacing site**, when using the StimLink, always verify the final stim setting on the EP Recorder Equipment before stimulating. The StimLink allows automatic changing of recorder stim setup according to Stimulator output channel, however, actual stimulation site may become different to that on the Stimulator if user manually changes the EP Recorder Stim Setup. DO NOT stimulate the patient until confirming that the stimulation site on the EP Recorder is appropriate.
- ❑ **To avoid recording incorrect procedure data in the patient's record**, always verify the EP Recorder Log to be an accurate record of the EP study prior to release of the procedure report.

1.2 Description of Accessory

This StimLink™ accessory for the EPS320 Cardiac Stimulator enables a digital data link from the Stimulator to suitably compatible EP Recording Equipment, such as the Bard LS™ Pro™ EP Recording system. The data link transmits Stimulation Protocol and stimulation status information, allowing automated Stim Log entries in the EP Recorder and faster stim detection.

The StimLink™ data flow is unidirectional and opto-isolated from the Stimulator to the Recorder preserving the reliable operation of the EPS320 Stimulator independent of the StimLink™ or other connected equipment.

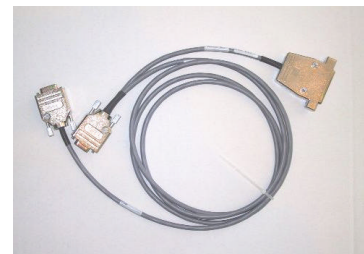


Figure 1 StimLink™ Cable

1.3 Compatible Equipment

The StimLink Accessory is compatible with EPS320 Software Version 3.19 or later and EPS320 SGU Firmware 4.68 or later.

StimLink is compatible with Micropace Four Channel Stimulus Multiplexer, MP3086.

The Bard LabSystem™ PRO™ Software Ver 1.0 and higher is suitable for and has been verified to interface with the StimLink. Refer to the LST™ Pro™ documentation for further details.

1.4 How Supplied

Packing List:

StimLink™ Kit		
Item	Part No.	Qty
StimLink™ Cable	MP3087	1
StimLink™ Mating Cable	MP3088	1
StimLink™ Installation Manual	MP3100	1
StimLink™ Instruction Manual	MP3159	1

Table 1 StimLink™ Packing List

2. Using the StimLink

2.1 EP Recorder responses to Stimulation

The function and use of the EPS320 Stimulator is unaltered by the StimLink™. The EP Recorder however responds to some actions of the Stimulator as described in Table below.

EPS320 Stimulator action	EP Recorder Action																
1. Change Stimulation Protocol	<p>The EP Recorder may be programmed to recognise and log the new protocol and optionally, to set up a specific recording configuration for each protocol.</p> <p>The following protocols are defined in EPS320:</p> <table style="margin-left: 40px;"> <tr> <td>0 THRESHOLD</td> <td>8 DELAYED_AV</td> </tr> <tr> <td>1 NODAL_ERP</td> <td>9 LOAD_ATP¹</td> </tr> <tr> <td>2 SNRT</td> <td>10 OVERDRIVE¹</td> </tr> <tr> <td>3 PACE</td> <td>11 X_RSYNCD_S2</td> </tr> <tr> <td>4 BURST</td> <td>12 EMERGENCY_PACE¹</td> </tr> <tr> <td>5 WENCKEBACH</td> <td>13 PACED_S2¹</td> </tr> <tr> <td>6 VT_STUDY</td> <td>14 BIV_PACE¹</td> </tr> <tr> <td>7 RSYNCD_S2</td> <td></td> </tr> </table> <p>Thus Recorder actions may include:</p> <ol style="list-style-type: none"> 1. Change protocol-defined parameters, which include setting window arrangement, displayed / recorded channels, gains. 2. Start new IECG recording block 3. Record name of new protocol in Patient Log 	0 THRESHOLD	8 DELAYED_AV	1 NODAL_ERP	9 LOAD_ATP ¹	2 SNRT	10 OVERDRIVE ¹	3 PACE	11 X_RSYNCD_S2	4 BURST	12 EMERGENCY_PACE ¹	5 WENCKEBACH	13 PACED_S2 ¹	6 VT_STUDY	14 BIV_PACE ¹	7 RSYNCD_S2	
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7 RSYNCD_S2																	

EPS320 Stimulator action	EP Recorder Action
2. Select New Pacing Site	When changing between Chan 1 / 2 and Chan3 / 4, the Recorder can select corresponding user-defined amplifier Stim Setup configuration A or B. This feature is not enabled in the Bard LS-Pro Ver. 1.0 or 2.0.
3. Stimulate	EP Recorder receives paced or sensed stimulation intervals S1 or S2-S7 while pacing, facilitating auto-measurements and accurate Stim Log.
4. Stop pacing or end of pacing sequence in a repeating protocol	End of pacing sequence accelerates EP Recorder Stim Log entry and auto-analysis by removing the need for LS-Pro to wait 1-2 seconds after user stops pacing to determine that pacing has indeed stopped.

Table 2 EP Recorder actions in response to StimLink commands

Note 1: Not implemented in Bard LabSystem™ and EPS320 Software 3.20 at this stage, these protocols do not generate automatic new protocol entries in the LS Pro.

2.2 EPS320 – LS Pro Protocol Codes

The LS Pro software recognizes only the core Micropace Protocols, which it can map to its own protocol names. Other Micropace protocols and procedures transmit to the LS Pro the nearest corresponding protocol. Where no corresponding protocol exists, the 'Pace' Protocol code is transmitted to indicate on the LS Pro Patient Log a change in Pacing Protocol; in most instances, the actual protocol used will be apparent from the stimulus interval panel (e.g. ATP_AICD_Style).

The following lists all the EPS320 Protocols, which can be displayed on the LS Pro Patient Log.

Time	Comment	PCL	Site	Location
Burst Pace				
OO Pace	Event #2	600	Both	Both
OO Pace	Event #3	380	Ventricle	Ventricle

Figure 2-1 EPS320 Protocols which can be displayed on the LS Pro Patient Log

3. Technical

3.1 Error Messages

The following StimLink specific messages may be observed on power up (and 'NOTE-91' also may appear any time).

Message	Explanation
"NOTE-90 StimLink™ Detected, to enable the link set Config Service Var_29 to '2' or '3'. [Enter]"	StimLink hardware detected but software not configured to use it. User may optionally configure the software as directed.
"NOTE-91 StimLink™ NOT Detected, to enable the link connect StimLink™ cable to Recorder. [Enter]"	Stimulator configured for StimLink, but no StimLink hardware detected (the Normal MP3033 Comms cable may be installed instead). Connection of the StimLink to the PC DB9 COM1 connector required. Note: the physical connection on the EP Recorder side is not monitored by the PC.
"NOTE-92 SGU Firmware version does not support four channels or StimLink™, please set Config Service Var_29 to '0'. [Enter]"	EPS320 SGU Firmware version 4.68 or higher is required for StimLink. Stimulator must be configured to disable StimLink commands with earlier Firmware versions to prevent interference with its other normal functions. Contact your distributor for a Firmware upgrade.

Table 3 List of error codes and explanations.

3.2 Troubleshooting

For installation error messages refer to Error Messages above.

Problem	Possible causes and Suggested remedies
1. No StimLink information appears on EP Recorder	StimLink cable not installed properly. Verify that cable is connected from PC to SGU and to the EP Recorder Com Port (the DB9 connector with two cables should be in the EPS320 PC and not the Recorder PC).
	EPS320 not configured for StimLink – verify that Config Service Var-29 is set to 2 or 3 (see associated help message with 'h' hotkey).
	Incorrect COM port used on EP Recorder – verify.
	EP Recorder not configured to receive StimLink – refer to EP Recorder documentation
	StimLink cable may be faulty – contact your distributor.
2. EP recorder Stim Channel setting differs from the Stimulator's Pace Site.	EP Recorder may be not enabled for Stim Setup control by StimLink – refer to EP Recorder's documentation.
	EP Recorder Stim Setup may have been changed manually either directly or resulting from a StimLink-directed change in windows setup / protocol change; as the StimLink is only one way, the Stimulator can not detect changes made in the EP Recorder. Re-selecting Pace Site on the Stimulator will correct the Stim Setup on the EP Recorder. Verify also the EP Recorder Windows setups do not change Stim Setup unexpectedly.