Printing

Contents

Overview

This chapter describes the following Spacelabs Healthcare printers:

- 90449 bedside printer module
- 90469 (two- and four-channel) system printer module
- SL2400/SL2600 printer (optional)
- 90838 PrintMaster laser printer

Printers can provide printouts of the following:

- Automatic recordings of any parameter in an alarm condition (if configured in the Module Configuration Manager and if the Alarm Parameters function is enabled for that parameter).
- Parameter data such as:
  - patient name, bed name, and time and date of the printout
  - vital signs, edge annotation, and scaling information
  - waveform data (including timing tick marks and a grid)
  - arrhythmia/ST segments

- Non-waveform data displayed on-screen, such as:
  - tabular trends
  - hemodynamic calculations
  - drug dose calculations
  - graphic trends
  - alarm limits review
  - Vitals report (SL2400/SL2600 monitor only)

Printing Configurations

Each Spacelabs Healthcare, network-connected, patient monitor is capable of sending recordings to either of two network printers. These can be configured in several ways.

Configuration #1

The two printers share the printing load, and the monitor automatically determines which printer is best for each type of recording:

- Generate the most timely output of high priority recordings.
- Ensure that subsequent recordings from one patient over a short time span are processed by one printer.
- Use paper as efficiently as possible.

When the printing load is heavy, these objectives may conflict.

The following factors are taken into consideration when a print request occurs:

- Are either of the two printers outputting, holding in memory queue, or loading in queue a print job from this monitor?
- Are either of the printers idle?
- Is this a high priority request (alarm vs. manual)?
- Are either of the printers currently printing a continuous recording?
- Are either of the printer's queues full?
- Which of the printers is the preferred size for this request (1, 2, or 4 channels)?

At the time of a printing request, the monitor from which the request originated evaluates both of the available printers one at a time, providing a score for each of the two printers. Each printer's evaluation passes all the way through the priority tree from the score at the top of the tree to the score at the bottom of the tree. The printer generating the highest score gets the job. If the evaluation produces the same score for each printer, the print job is sent to the printer designated as the primary printer for that monitor.

Configuration #2

One printer is designated as the primary and the other printer is designated as the backup.

All recordings are sent to the primary printer, unless it is unable to print for one or more of the following reasons:

- Off-line
- Out of paper
- Disconnected from network
- Powered OFF
- Print queues are full
- Unable to accept recording type

If the primary printer is unable to print, the recordings are then sent to the backup printer, unless it is also unable to print for a reason listed above.

Configuration #3

Only one printer is available because the network is configured so that recordings from a given monitor are directed to only one printer on the network. During times of simultaneous multiple bed alarms, the selection rules will not be applicable, and print performance will be affected.

Printing Priorities

The following list defines printing priorities from the highest to lowest:

- Alarm recording or a manual recording request via a monitor
- RECORD ALL request via a bedside monitor
- RECORD ALL request via a central monitor
- Non-waveform recordings (for example, trends)
- All Arrhythmia/ST classes

In all network printing cases:

- High priority print jobs bump lower priority jobs. For instance, an alarm recording will bump graphic trends to a lower position in the print queue.
- A high priority request erases as many lower priority requests as needed to make room for the data it contains. For example, a fully loaded printer will bump graphic trends out of the queue.

A status message is not displayed when a print request replacement occurs.

Note:

Recordings in the process of being printed cannot be interrupted or delayed by additional print requests.

Recording Buffer and Printer Transitions

The printer modules have limited ability to store the waveform data for additional printouts while actively printing.

A continuous manual printout or an alarm printout may exceed the capacity of the printer module's storage buffer. When the current printout ends and the next queued printout begins, the printer will output the stored waveform data, followed by current waveform data. A printer transition indicator displays between the end of the stored waveform data and the beginning of the current waveform to mark a section of missing waveform data. The width of the indicator is constant. It does not indicate the amount of missing data, just that there is data missing.

The printer transition indicator is indicated on the printer strip by a downward line, followed by a bottom flatline, then a rapid return to the waveform (refer to *Figure 9-1*).

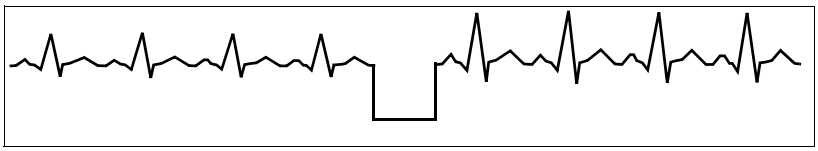

Figure 9-1: Print transition indicator

90449 Printer Module

The 90449 printer module (refer to *Figure 9-2*) is a two-channel printer that provides automatic and manual recordings of parameter data on 50-mm, fanfold paper. This printer module prints recordings of parameters in alarm conditions, in requested waveforms, and in non-waveform data.

Note:

This 90449 is not designed for use as a system printer and will not function correctly if used in this manner.

Figure 9-2: 90449 bedside printer module

Loading Paper

When loading paper into the paper tray, the small, black, rectangular cue mark on the bedside printer paper must face out and be at the bottom of the tray. Each recording begins at the Z-fold perforation, and blank sheets are not placed between successive print requests.

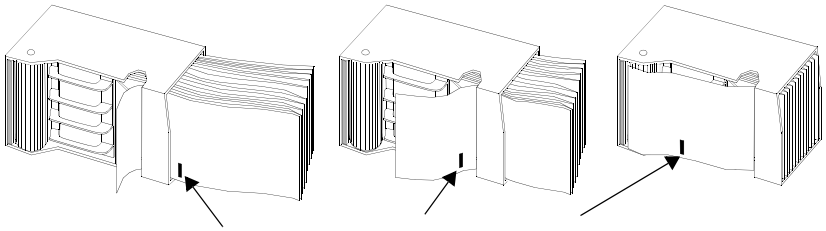

Figure 9-3: Bedside printer module paper tray

Note:

Note the orientation of the small cue mark.

To load paper:

- Press the **Eject** button next to the PAPER OUT light.
- Pull out the plastic paper tray.
- Discard old cardboard retainer inside tray.
- Remove the label from the new paper, but keep the cardboard retainer in place around one end.
- Start inserting the paper into the paper tray, beginning with the cardboard retainer end.
- With the paper halfway into the paper tray, lift up the spring-loaded roller.
- Bring out the top fold of paper from under the top end of the cardboard retainer.
- Bring the top fold over the top of the spring-loaded roller.
- Release the spring-loaded roller onto the remainder of the paper.
- Insert the stack fully.
- Unfold the paper and position it over the top of the black roller at the end of the tray.
- Slide the tray completely back into the printer module.