

SKYLINE

Central Nurse Station for Bedside Monitors

M 7137

M 7138

M 7139

Micromon

SKYLINE

GENERAL DESCRIPTION

KONTRON MEDICAL's advanced central nursing station,"SKYLINE" is a system, consisting of software and hardware supplied by KM. This system uses a personal computer operating in Windows 98 environment.

SKYLINE displays various parameters with waveforms of 8 bedside monitors connected to SKYLINE through RS 485 communication port. Dedicated additional hardware (SKYLINE PC Interface Card [SPICI) is plugged into the ISA slot in a PC, and communicates with the monitor and Windows operating system. Dedicated device driver is used to transfer messages between the user interface and the SPIC. The driver software ensures error free communication. User interface with most of the operations through mouse control is very easy to use. SKYLINE can communicate with following patient monitors of KONTRON MEDICAL viz. M 7137, M 7138, M7139 & Micromon (with Micromon to SKYLINE interface kit).

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Installation conditions

In order to help you plan out site requirement for SKYLINE installation, we have listed below two key points :-

- a. site selection and site preparation.
- b. selection of power conditioning equipment.

a Site selection and preparation

Proposed SKYLINE site should be selected keeping in mind various external factors which will affect normal operation of the system in long run. It is advisable to avoid areas of strong Electro magnetic fields near the proposed site of installation e.g., Transmitting towers, HT transformer, HT and LT power transmission lines etc

Electrical connections and bedside monitor to SKYLINE wiring should be made with proper care to minimise the interference

5-amp sockets with proper grounding (G-N voltage < 2 volts) should be provided at the site of installation (1 socket for SKYLINE and individual sockets for bed side monitors).

b. Selection of power conditioning equipment

Depending on the voltage supply at your site, you must choose the appropriate voltage stabilizer. The SKYLINE requires regulated stabilized voltage for operation and hence it is required that you install any one of the following :

- Servo voltage stabilizer with high/low trip facility
- CVT (Constant Voltage Transformer)
- UPS (Uninterrupted Power Supply)
UPS is recommended for SKYLINE to avoid loss of data in case of power failure

The voltage and power specification for the voltage stabilizing equipment

Input voltage range	:	180V to 260V AC single phase
Output regulated voltage	:	230V AC +/- 2% single phase
Power ratings	:	1.5 kVA (This rating is suggested for ICCU layout with 8 monitors and SKYLINE)

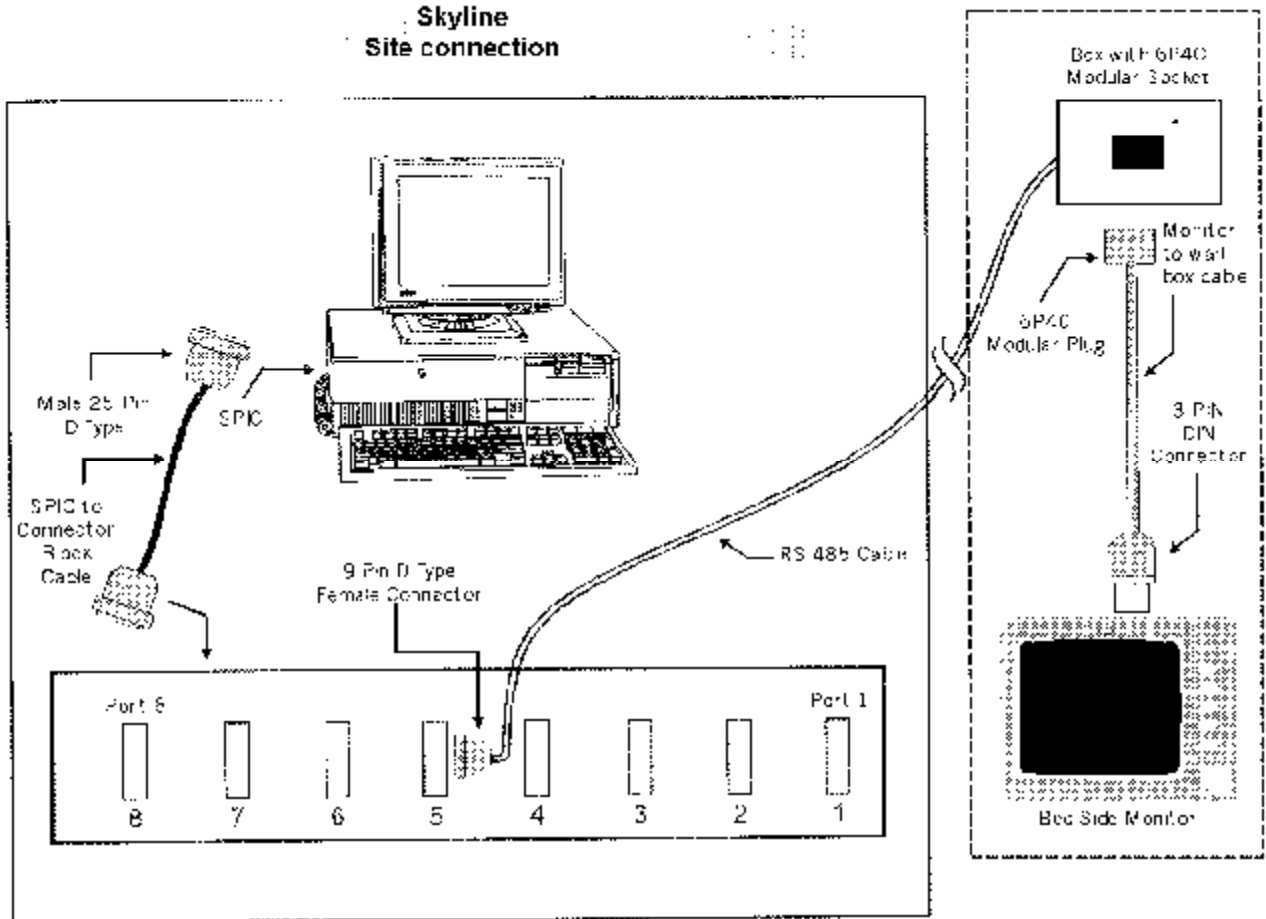
Caution : In case of power failure, SKYLINE will retain the trend data but recall of last 16 alarms will be lost.

PC specifications for Skyline

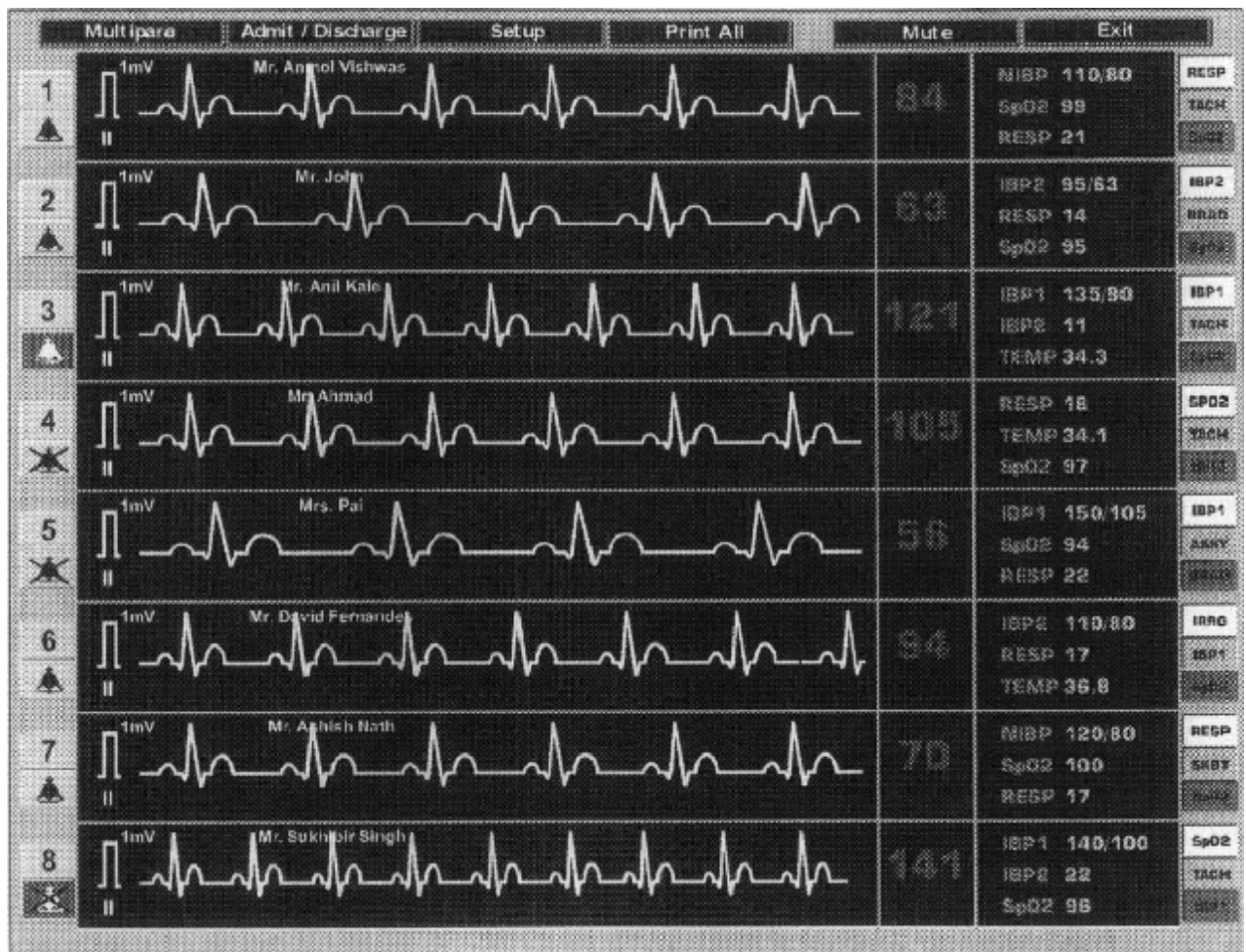
System	Minimum requirements
PC Type	IBM PC AT Compatible
Processor	Pentium II, Pentium MMX, Pentium
Processor Speed	Greater than or equal to 166MHz. (300/350 MHz. Is preferred).
RAM	64 MB or more
CACHE Memory (External)	512 KB or more
Display Card	PCI Bus compatible, SVGA colour
Sound Blaster card	PCI Bus compatible.
ISA Slots	Three
PCI Slots	Three
Mouse	Logitech (Serial) (3 buttons)
Keyboard	105 Keyboard
Hard Disk	8.3 GB or more
CD ROM Drive	52 x (Creative make)
Monitor	17 “ Colour SVGA
Speakers	4W 8 ohms. ;2 nos
Display resolution	1024 x 768 Large fonts
UPS	1kVA
	<i>This accessory is must as the Skyline needs proper shutdown like Windows in case of prolonged power failure.</i>
Printer	HP Inkjet (600 series printers are recommended)
PC should have ODBC driver.	

System Should have legal Windows 95/98 Installed .

Skyline
Site connection



Multibed mode



Multibed mode screen

This mode will display.

1. Patient name, bed number and alarm status of bedside monitor
2. ECG waveforms for 6 seconds alongwith selected lead and gain.
3. Parameter display of Heart Rate and 3 selected parameters (User selectable and depending onthe bedside monitor).
4. A list of last three alarm conditions for each bed will be displayed in the multibed mode. Following conditions can be observed:

- IBP2** Latest alarm without background.
- BRAD** One prior to the latest in light background.
- SPO₂** First occured in dark background.

Multibed modes creen have following controls in MENU bar.

Multipara	Admit/ Discharge	Setup	Print All	Mute	Exit
------------------	-----------------------------	--------------	------------------	-------------	-------------

Multipara Click here, a drop down list of bed numbers will appear.

- 7
- 8
- 9
- 10**
- 11
- 12
- 13
- 14

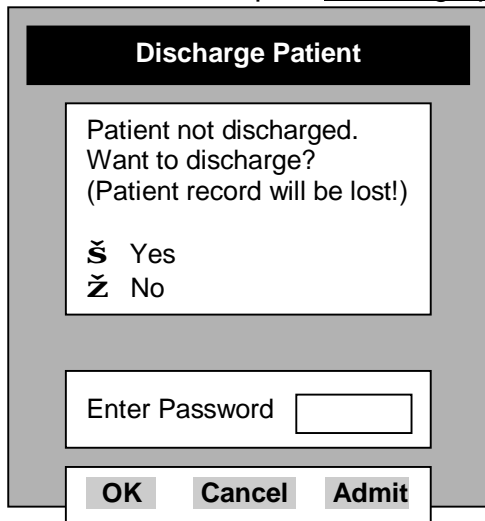
Click on the desired bed number will take you to the multiparameter mode.

Admit / Discharge Click here, a drop down list of bed numbers will appear.

- 7
- 8
- 9
- 10
- 11**
- 12
- 13
- 14

Click on the bed number will show you the present status of the bed (Occupied or Vacant) and will enable you to admit new patient or discharge presently monitored patient.

I) If the bed is occupied Discharge patient window will appear.



OK : Click this to confirm.

Cancel : Click this to escape.

Admit : This will allow you to discharge present patient and will ask for new patient information .

Discharge patient window

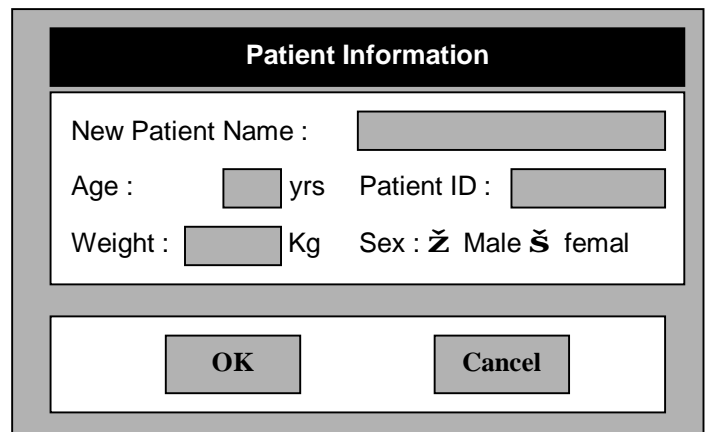
To discharge patient :

- Click **Ž** yes
- Enter password : skyline (Lowercase)
[User can set his / her own password. Refer page 11]
- Click **OK**
- Click **Admit**; Patient information window will appear

II) If the bed is vacant; New patient data window appears.

Enter or change particulars and click **OK** to confirm.

Click **Cancel** to escape.



Patient information window

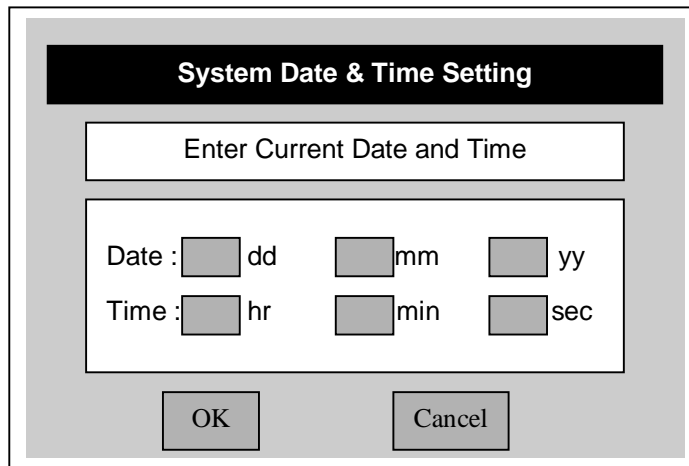
Caution: Discharging a patient will erase all stored data of patient like trend, arrhythmia strip storage records etc., pertaining to that patient.

Setup

Click here to see setup list.

- Date & Time ----- a.
- Alarm duration ----- b.
- Parameter settings ----- c.
- Change bed ----- d.
- Password setting ----- e.
- Select equipment ----- f.

a) **Date & Time** will allow you to set System date and time. Following display will appear.



The image shows a window titled "System Date & Time Setting". Inside the window, there is a text box that says "Enter Current Date and Time". Below this, there are two rows of input fields. The first row is labeled "Date :" and has three boxes for "dd", "mm", and "yy". The second row is labeled "Time :" and has three boxes for "hr", "min", and "sec". At the bottom of the window, there are two buttons: "OK" and "Cancel".

System Date & Time setting window

Enter correct date & time and click on OK for storage.



The image shows a window titled "Audio Alarm Setting". Inside the window, there is a section labeled "Alarm Period". Below this, there are three radio button options: "Continue", "4 seconds", and "No alarm". At the bottom of the window, there are two buttons: "OK" and "Cancel".

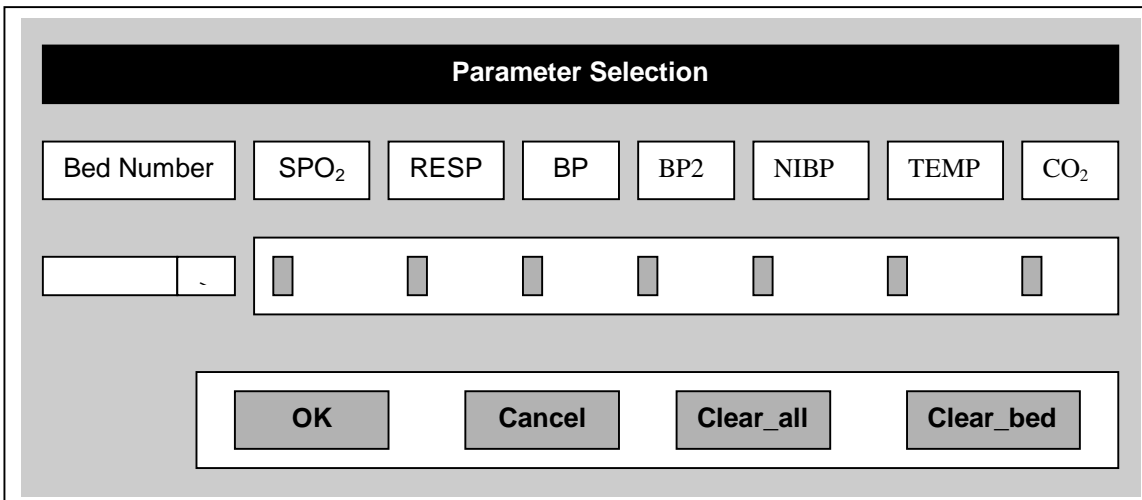
Audio alarm setting window

b) **Alarm duration** will show you Audio alarm setting window.

Select desired audio alarm duration
Now click **OK**.

Change in alarm duration is applicable for all SKYLINE beds.

c] **Parameter settings** window is provided to allow selection of 3 parameters which can be seen in multibed mode. (numeric values only)



Steps for parameter setting

i] Click here to select a particular bed number

ii] **Clear_all** Click here to clear parameter settings of all beds

OR

Clear_bed Click here to clear parameter settings of selected bed.

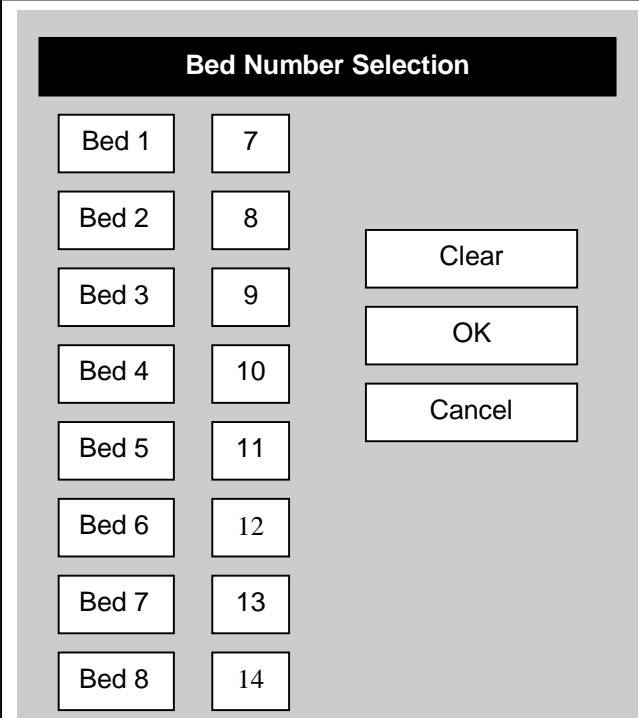
iii] Select parameters by clicking on the blank box below parameter box.

will indicate parameter selected.
You can select a maximum of 3 parameters.

OK Click here to enter details.

Cancel Click here to escape.

d] **Change bed number** will allow you to change the bed number.



Bed Number Selection	
Bed 1	7
Bed 2	8
Bed 3	9
Bed 4	10
Bed 5	11
Bed 6	12
Bed 7	13
Bed 8	14

Clear

OK

Cancel

Clear : Click here to clear present bed numbers.

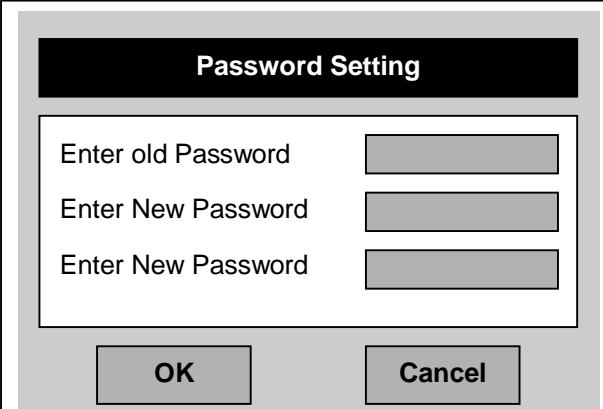
Enter new bed number.

Click **OK**

Cancel : Click here to escape.

Bed number selection window

e] **Password setting** will allow you to set your own password to enter into patient admit / discharge menu.



Enter old Password

Enter New Password

Enter New Password

OK

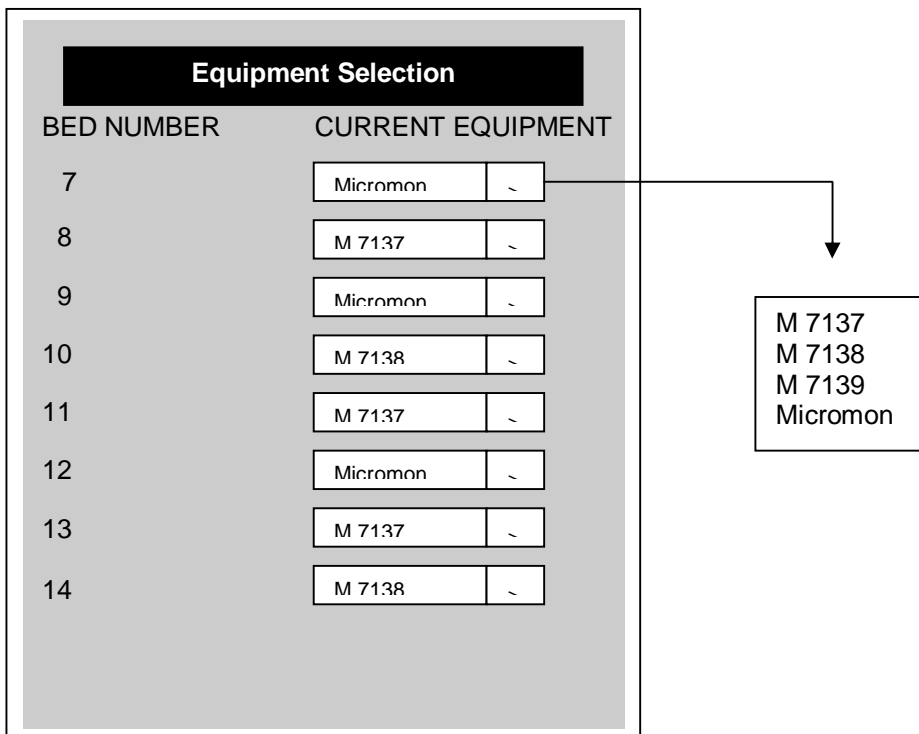
Cancel

Enter respective passwords and click **OK**.

Password setting window

NOTE : Passwords are **case sensitive**

f] **Select equipment** allows user to select the bedside monitor model.



Equipment selection windows

Print All

Click here to take two page printout of ECG waveforms of multibed

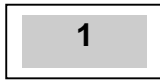
Mute

Click here to mute audio tone of CNS alarms.

Exit

Click here to exit SKYLINE. This shut down the operation of PC and SKYLINE system

There are following controls for each bed.



(Bed Number) Click here to see pop up menu



for taking selected bed's 4 seconds ECG printout.



This control can be used to mute audio alarm of bedside monitor

This also indicates the following conditions:

1. Displays the bedside monitor alarm status i.e. suspended or not.



This indication means alarm not suspended.



This indication means alarm suspended.

2. Alarm indication.


A flashing red background will mean patient related alarm.

A flashing yellow background will mean equipment related alarm

A gray background will mean no alarm

[Not applicable for Micromon]

3. To mute bedside monitor alarm.

In case of alarm, click on  to mute the bedside monitor alarm

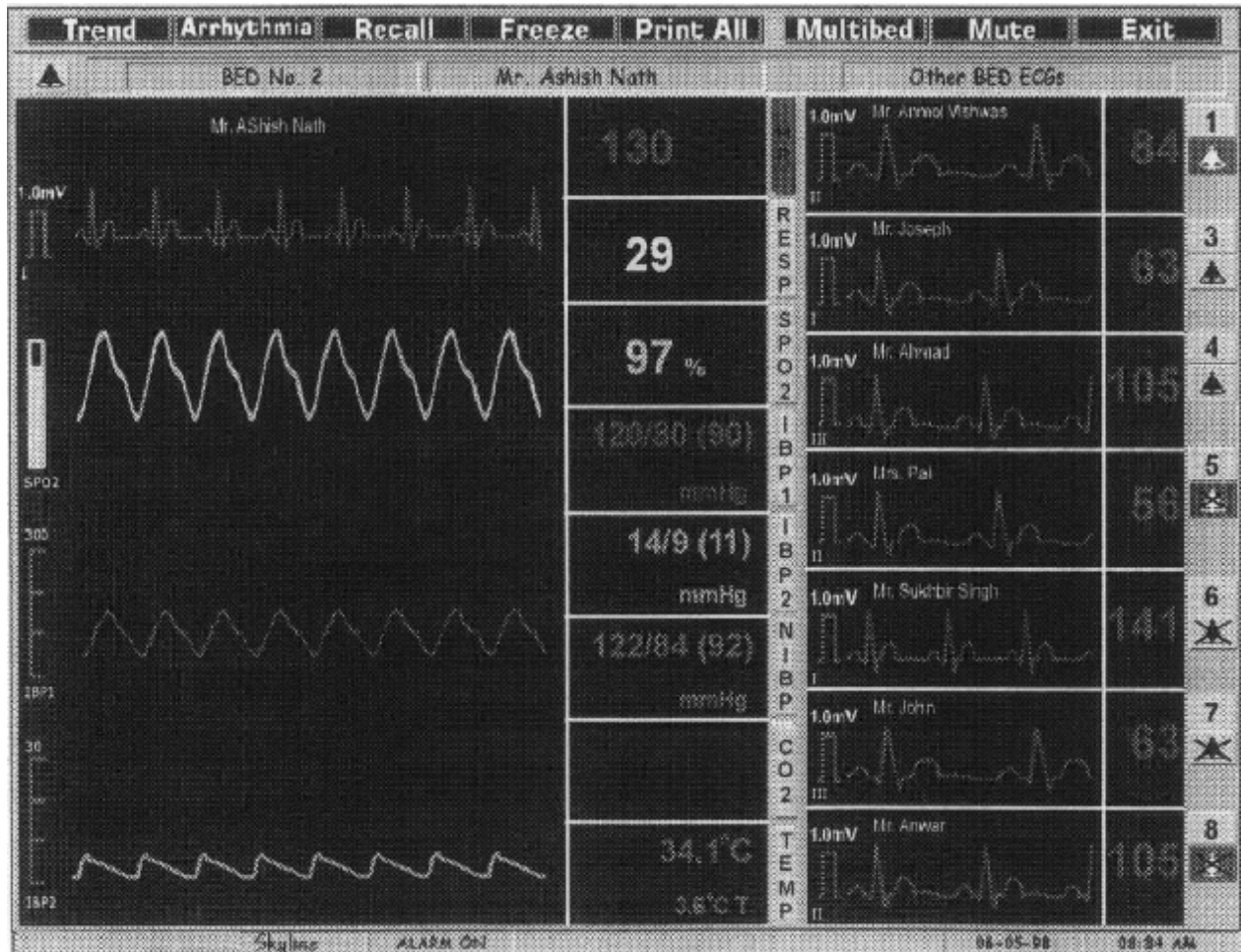
[Not applicable for Micromon]

NOTE :

- i. If the bedside equipment is not powered ON or not connected then the message "monitor not connected or link failure" will be displayed in place of waveform.
- ii. ECG waveform may overlap the name, in case of higher amplitude.
- iii. If the bed number entered by the user is different from the one received by CNS from bedside monitor then error message will be displayed.

Blank Page

Multi-parameter mode



Multi-parameter mode screen

This mode will display .

1. Maximum of 4 parameters and waveforms (same as displayed by the bedside monitor).
2. Parameter readings for maximum of 8 parameters (same as displayed by the bedside monitor).
3. Bed number, alarm indication and name on the top of the screen for selected bed.
4. 2 seconds ECG waveform of other 7 beds.
5. Name of patient and bed number along with alarm status indicator for each bed in case of other beds.

Multiparameter screen has following controls in the MENU bar

Trend	Arrhythmia	Recall	Freeze	Print all	Multibed	Mute	Help
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Trend

Click here to enter into 24 hours graphical trend screen for selected bed. Refer chapter 6 for details

Arrhythmia

Click here to enter into 24 hours of arrhythmia trend mode for selected bed. Refer chapter 5 for details

Recall

Click here to recall last 16 alarm conditions of selected bed.
(patient related)

Date	Time	Parameter	Value	Units
03 : 09 : 1999	14 : 37 : 40	HR	121	
03 : 09 : 1999	14 : 38 : 03	HR	124	

OK

Freeze

Click here to freeze the waveforms of selected beds
Click again to defreeze.

Print All

Click here to take printouts of all parameters and waveform
for selected bed.

Multibed

Click here to revert back to multibed mode screen

Mute

Click here to mute CNS alarm

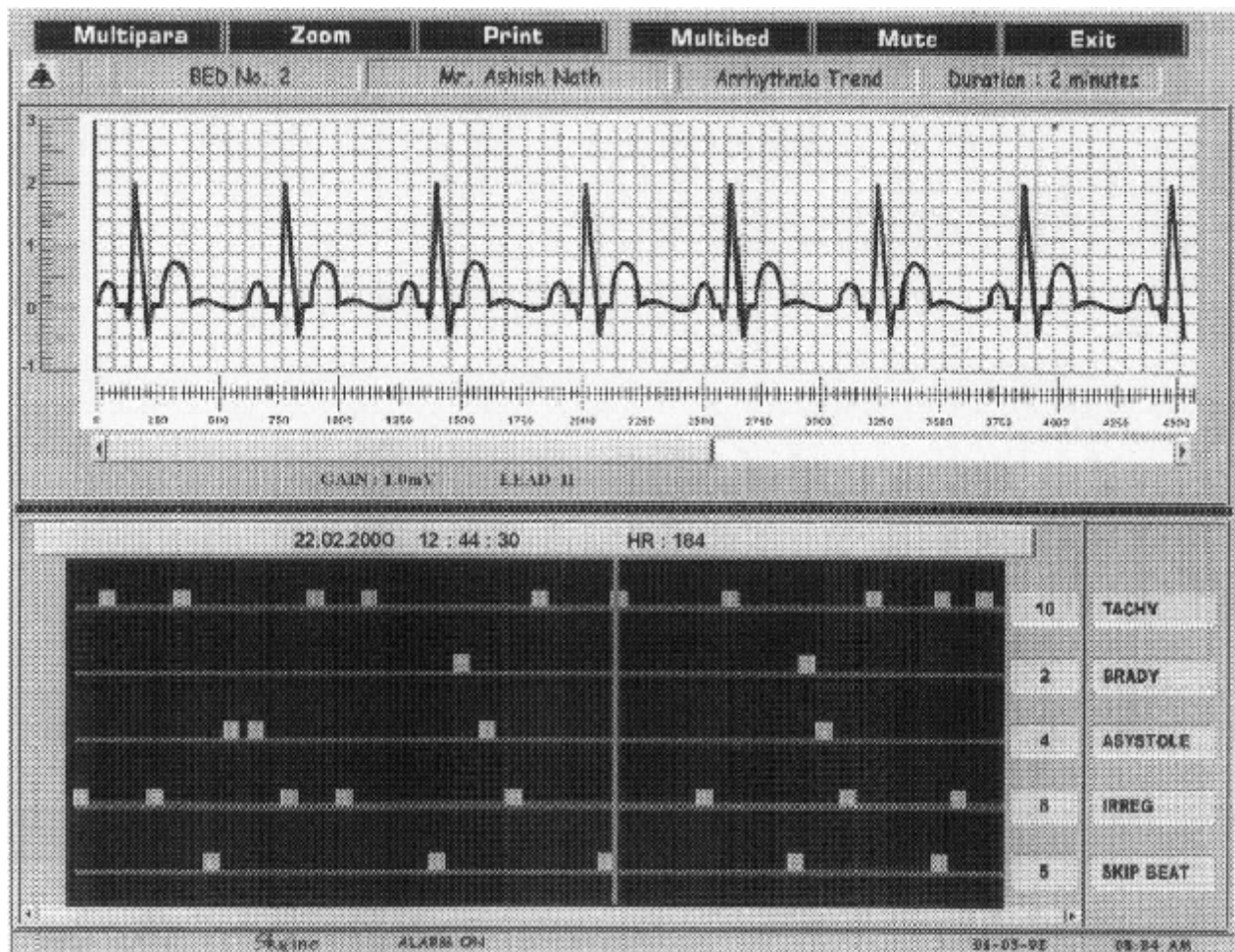
Exit

Click here to exit SKYLINE. This shuts down the operation
of PC and SKYLINE system.

NOTE :

Visual alarms for a particular parameter will be indicated by a change in the
background colour of parameter label.

Arrhythmia mode



Arrhythmia trend

NOTE :

This mode is not applicable for Micromon

For a selected bed this mode will display :

- 1 24 hrs graphical trend screen for arrhythmia.
- 2 ECG strip for -6 to +2 seconds for each arrhythmia along with information of lead selected and gain.
- 3 Arrhythmia count for tachycardia, bradycardia, asystole, irregular and skipped beat.
- 4 Vertical cursor in graphical arrhythmia trend.
- 5 Date and time with respect to vertical cursor.
6. Patient name and bed number on top of the screen.
- 7 Horizontal scrollbar for scrolling through data.

Arrhythmia trend mode screen will have following controls in MENU bar

Multipara	Zoom	Print		Multibed	Mute	Exit
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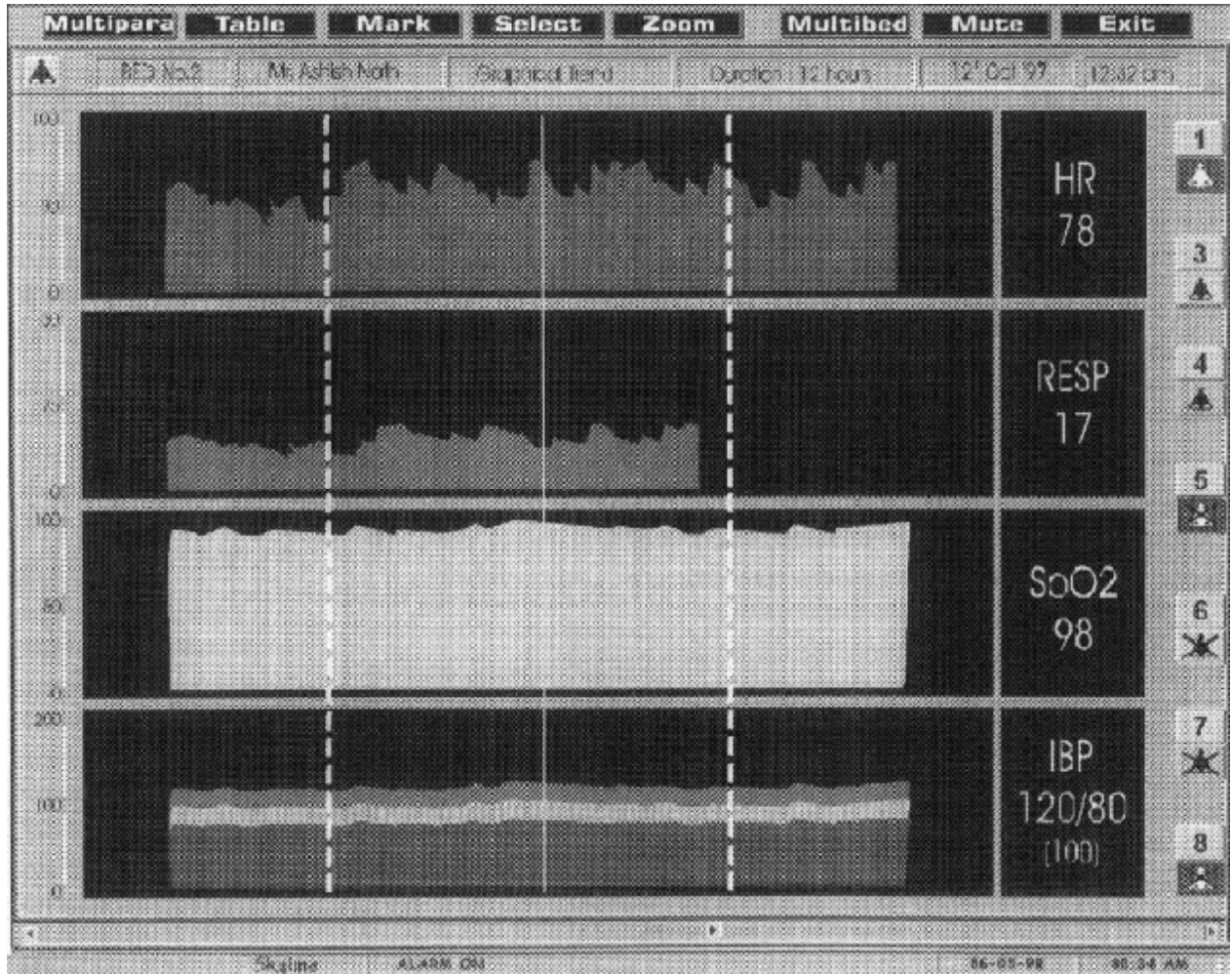
Multipara	Click here to revert to multiparameter mode screen of selected bed.
Zoom	Click here to zoom in from 12 hours to 2 hours and viceversa.
Print	Click here to take the printout of ECG strip stored
Multibed	Click here to view the multibed mode.
Mute	Click here to mute CNS alarm.
Exit	Click here to exit SKYLINE. This shuts down the operation of PC and SKYLINE system

NOTE :

- i. Arrhythmia trend will be available for 24 hours duration from the time of entry into the arrhythmia mode.
- ii. The default display will be of 12 hours
- iii. The ECG strip will be shown, with scale for arrhythmia occurrences when the resolution is 2 minutes.
- iv. The background will be black for waveform display in all screens but for arrhythmia screen it will be white

Trend mode

- q Graphical trend
- q Tabular trend



Graphical trend

For selected bed this mode will display :

1. Bed number alarm indication and patient name on the top of the screen:
2. 24 hours graphical trend data in 12 hours (6 minute resolution) or 2 hours (1 minute resolution) format.
3. Graphical trend for H R and 3 selectable monitor dependent parameters.
4. Vertical cursor and a horizontal scrollbar for scrolling through data
5. Date, time and numerical values corresponding to the record of each parameter, at the cursor's position:
6. Alarm status of other beds:

Graphical mode screen will have following controls in MENU bar.

Multipara	Table	Mark	Select	Zoom		Multibed	Mute	Exit
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Multipara

Click here to revert to multiparameter mode of selected bed.

Table

Click here to view the trend in tabular format

Mark

Click here to mark starting and ending points of specific graphical trend data.

As soon as you mark these two points in graphical trend, the system will switchover to tabular trend format for selected area. This selected area will be highlighted with white background.

While switching from the graphical to tabular format it will show following message

**Please Wait !!!
Reading Database**

This function can be used to select three parameters for display in graphical trend mode.

Select

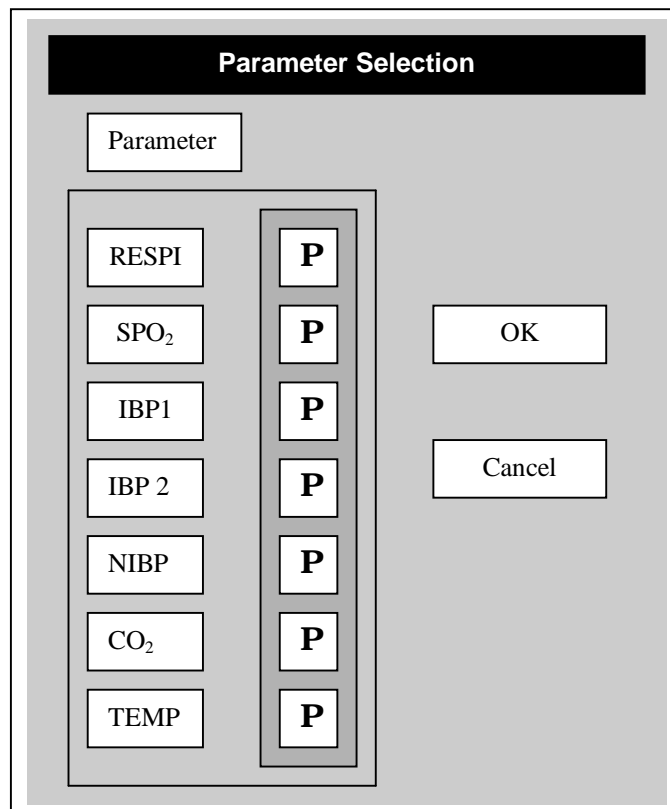
Click here to see parameter selection window.

Select parameters by clicking on the blank box provided in front of parameters.

P will indicate parameter selected.

Click **OK** to enter the selected parameters.

Click **Cancel** to escape.



Parameter selection window

Zoom

Click here to zoom from 12 hours to 2 hours trend scale. This will change the resolution of the trend display.

Multibed

Click here to revert to multibed mode screen.

Mute

Click here to mute the CNS alarms.

Exit

Click here to exit SKYLINE. This shuts down the operation of PC and SKYLINE system.

NOTE :

- i. Trend data will be available for 24 hours from the time of entry into the graphical mode.
- ii. Trend data will be displayed in the form of a bar graph. Scale will also be displayed.
- iii. The default resolution will be 6 minutes
- iv. If user goes to tabular trend screen without marking the data in graphical trend screen.

Then Print button in the tabular trend screen will be disabled.
- v. Click the left and right arrow buttons of the scrollbar to scroll through trend by one record.

Multipara		Graph		Print		Multibed		Mute		Exit	
BED No. 2		Mr. Ashish Nath				Tabular trend		Resolution : 1 minute			
DATE	TIME	HR	SPO2	IBP1	IBP2	NIBP	RESP	CO2	T1,T2		
12.10.97	12:31	116	97	122/80 (90)	16/10 (12)	120/80 (93)	17		37/34		
12.10.97	12:32	118	97	120/81 (91)	14/9 (11)	127/84 (98)	16		36/33		
12.10.97	12:33	114	98	122/80 (90)	18/11 (9)	117/76 (89)	19		38/35		
12.10.97	12:34	121	96	120/81 (91)	16/10 (12)	120/80 (93)	18		37/34		
12.10.97	12:35	120	97	122/80 (90)	18/11 (9)	117/76 (89)	17		38/35		
12.10.97	12:36	119	97	122/80 (90)	14/9 (11)	127/84 (98)	16		38/35		
12.10.97	12:37	118	96	120/81 (91)	16/10 (12)	120/80 (93)	19		37/34		
12.10.97	12:38	117	95	122/80 (90)	18/11 (9)	117/76 (89)	18		36/33		
12.10.97	12:39	114	92	118/74 (88)	14/9 (11)	117/76 (89)	17		37/34		
12.10.97	12:40	118	94	122/80 (90)	14/9 (11)	120/80 (93)	16		38/35		
12.10.97	12:41	122	96	122/80 (90)	16/10 (12)	127/84 (98)	19		38/35		
12.10.97	12:42	123	97	118/74 (88)	18/11 (9)	117/76 (89)	18		37/34		
12.10.97	12:43	128	97	120/81 (91)	16/10 (12)	120/80 (93)	17		36/33		
12.10.97	12:44	130	97	122/80 (90)	18/11 (9)	117/76 (89)	16		38/35		
12.10.97	12:45	129	96	118/74 (88)	14/9 (11)	127/84 (98)	19		37/34		
12.10.97	12:46	124	97	122/80 (90)	16/10 (12)	120/80 (93)	18		38/33		
12.10.97	12:47	122	98	120/81 (91)	14/9 (11)	117/76 (89)	17		38/35		
12.10.97	12:48	117	96	122/80 (90)	16/10 (12)	127/84 (98)	16		37/34		
12.10.97	12:49	114	97	118/74 (88)	14/9 (11)	120/80 (93)	19		38/35		
12.10.97	12:50	118	96	120/81 (91)	18/11 (9)	127/84 (98)	18		38/33		
12.10.97	12:51	115	96	122/80 (90)	16/10 (12)	120/80 (93)	17		37/34		

Tabular trend

This mode will display

1. 24 hours of numerical trend values in tabular format for all parameters.
2. Patient name, alarm status, resolution and bed number on top of the screen
3. Date and time alongwith numerical values.
4. Vertical scrollbar for scrolling through data.

Tabular trend mode screen will have following buttons in MENU bar

Multipara	Graph	Print		Multibed	Mute	Exit
------------------	--------------	--------------	--	-----------------	-------------	-------------

Multipara

Click here to revert to multiparameter mode

Graph

Click here to revert to graphical trend screen.

Print

Click here to take printout in tabular format.



1 minute
6 minutes
Only alarms

[The option of taking printouts of trend data is available in tabular format only. To print trend, the user should mark the required area in graphical trend screen. Numerical values of marked data will be highlighted in tabular trend.]

Multibed

Click here to revert to multibed mode screen

Mute

Click here to mute CNS alarm.

Exit

Click here to exit SKYLINE. This shuts down the operation of PC and SKYLINE system.

NOTE :

- i. For alarm condition the text colour will be :

Red in case of patient related alarms.

Yellow in case of equipment related alarms.

[for Micromon it is always red irrespective of patient or equipment related.]
- ii. In case of equipment related alarms "FAULT" will be displayed.
- iii. Click the top and bottom arrow buttons of the scrollbar to scroll through trend by one record.