Screen Trends

Innovative presentation and analysis of patient information on IntelliVue patient monitors for clinical decision support
The mind’s eye view of

Clinicians draw mental images from their observations of patients’ vital signs all the time, looking out for patterns and significant deviations. IntelliVue’s trending features offer this dynamic “mind’s eye view” directly on the monitoring screen.

**IntelliVue makes unique views of information available at the patient’s side**

IntelliVue patient monitors incorporate innovations aimed at increasing the utility and value of patient monitor information at the bedside and central station. Flexible trending and display capabilities are built into every model. They give clinicians immensely powerful tools for real-time clinical analysis by providing context, highlighting patterns, and, for the first time, making deviations instantly recognizable.

Real-time waveforms and numerics are the core of patient monitoring. And context is vital to understand whether a patient’s status is stable, improving, or deteriorating.

Time frames are also important. Trends of 24 hours or more can give a good overview of the patient’s overall progress, but may not show brief events. Short-term trends clearly reveal recent deviations.

And finally, careful attention to the frame of reference in the visual display—the gridlines, colors, and alignment with other measurements, for example—can significantly help clinicians focus on relevant information and correlate different parameters.

Through close collaboration with clinicians who use our monitors, Philips has developed vivid representations of patient information to support clinical decision making. We’ve built these screen trends into every IntelliVue patient monitor.
The mind’s eye view of clinical measurements

Trending capability for clinical decision support

Graph/Vitals Trends  
(up to 72 hours)

Screen Trends  
(from 30 minutes to 12 hours)

High-resolution Trend Waves  
(typically 8 minutes)

Real Time Waves  
(depends on wave speed and trace length)

Numerics  
(updated once per second)

ST Snippets  
(updated once per minute)

Time content of data

<table>
<thead>
<tr>
<th>Days</th>
<th>Hours</th>
<th>Minutes</th>
<th>Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>72 hours ago</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Now</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Real-time monitoring

The benefits of screen trends to clinicians are compelling:

Clinical decision support
- Compressed wave data puts current values in context
- Aligned gridlines and time scales make it simple to evaluate several measurement trends at the same time

Ease of use
- The user interface is simple and intuitive
- All IntelliVue monitors share the same user interface
- Touchscreen navigation is available

Human factors
- Trend data and current data are in one place, so it’s easier to focus
- All numerics, real-time waves, and trends for a given measurement are the same color
- Visual data elements are bold and easily identified
- Different screen configurations present information in the best format for each patient
Screen trends are extremely flexible, displaying anywhere from 30 minutes to 12 hours of patient data without disrupting or obscuring real-time measurements. Three different formats—graphical, tabular, and horizon—are available.

Select a single parameter to display as a screen trend or group different parameters together. Grouped parameters all appear in the same format, with the same gridlines.
Graphical and tabular trends

Aligned trends and real-time waves have identical scales.

Trends and corresponding waves and numerics are color-matched.

The shading in the banded display highlights changes.

Grouped trends have the same duration.

This vertical split-screen shows real-time waves, graphical screen trends, and current numerics on an IntelliVue MP 50.

Aperiodic measurement trends can also be displayed in graphical format.

**Graphical trends** are especially useful in groups.
To make correlation easier, grouped trends have the same duration.

Also, when a graphical trend appears on the screen with its corresponding real-time wave, the scales are identical.

**Tabular trends** are embedded in the screen.
They are available for the following aperiodic measurements:
• NBP – non-invasive blood pressure
• C.O./C.I. – cardiac output
• PAWP – pulmonary artery wedge pressure
• ITBV/ITBVI – intrathoracic blood volume
• EVLW/EVLWI – extravascular lung water
• GEDV/GEDVI – global end-diastolic volume
• CFI – cardiac function index
• TOFcnt/TOFrat – neuromuscular monitoring

* Not available in the US.
Horizon trends extends the screen trend as a clinical decision support tool. This remarkable view focuses on deviations from a baseline the clinician chooses. The baseline could reflect a starting status or a goal value.

Shaded graph trends clearly illustrate deviations over time. A bold deviation bar gives graphic impact to the patient’s current status. And the trend indicator arrow shows the general direction of the patient’s measurements over the preceding 10 minutes of data.
Flexible screen configurations

IntelliVue patient monitor screens are very flexible. These are just a few examples of the configurations you can create.

Note how the graphical trends (left) tell the story of the patient’s progress, while the horizon trends (right) emphasize the overall direction of patient status. The horizon arrow indicates deviation in the patient’s current measurement at a glance.

The horizon bar always appears with horizon measurements (right). The graph trend is optional. The trend indicator arrow will appear only when there is a clear trend to the patient’s status. The patient must also have 10 minutes of prior measurements to evaluate.

With the horizon bars (right), ST deviations are simple to identify.
### IntelliVue trend display overview

<table>
<thead>
<tr>
<th>Features</th>
<th>Options</th>
<th>Resolution</th>
<th>Time span</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-time waveforms</td>
<td>Sweep speeds (mm/second)</td>
<td>Depends on measurement</td>
<td>Depends on speed and display configuration</td>
</tr>
<tr>
<td></td>
<td>6.25, 12.5, 25, 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numerics</td>
<td>1 second</td>
<td>up to 72 hours</td>
<td></td>
</tr>
<tr>
<td>ST snippets</td>
<td>60 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screen trends</td>
<td>Graphical and tabular trends</td>
<td>12 second sample</td>
<td>30 minutes – 12 hours</td>
</tr>
<tr>
<td>Horizon trends</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graphical trend calculated in relation to a baseline</td>
<td>12 second sample</td>
<td>30 minutes – 12 hours</td>
</tr>
<tr>
<td>Deviation bar</td>
<td>Updated every second</td>
<td>Current</td>
<td></td>
</tr>
<tr>
<td>Trend indicator</td>
<td>Based on regression line of last 10 minutes of 12 second samples; updated every 12 seconds</td>
<td>Current</td>
<td></td>
</tr>
<tr>
<td>High-resolution trends</td>
<td>Beat-to-Beat (e.g., btbHR)</td>
<td>4 samples/second as moving trace</td>
<td>Typically, 6 minutes at 3 cm/minute</td>
</tr>
<tr>
<td></td>
<td>Compressed wave (e.g., pressure, CO₂)</td>
<td>1 second average</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Numeric trends</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Screen trends are built into every IntelliVue patient monitor.