VLT® HVAC Drive – Trending Feature

The perfect solution for

- HVAC performance monitoring
- HVAC system efficiency improvement
- Generating actual energy savings

The VLT® HVAC Drive Trending Feature allows the user to easily gather detailed operation data about the drive and system it controls. It eliminates the need to provide and install dedicated data loggers.

Trending allows the drive to measure system demand over time for an energy analysis. This can help a user project future system energy requirements. Trending can also be a diagnostic tool for comparing past and present logs to determine if changes in the system had an impact on the energy demand.

For example, trending of fan and pump systems to monitor a variable, such as frequency (Hz), over time is essential for understanding the variation of flow in the system and its energy consumption.

The trend variable is measured every second and the value stored in the corresponding data bin is incremented. While it is most common to use bins that are of equal size, custom bin sizes can be set up to provide greater resolution for a range of measurement that is of most interest. It is easy to start a new analysis by resetting all bin data with a single parameter.

Trending a variable for continuous operation or a timed period

Trending can be used to monitor the drives output frequency (Hz) or motor speed (RPM), power (kW) delivered to the motor, or the motors current. Continuous data or timed data can be collected. Continuous bin data starts to accumulate when the frequency converter is started or when it is reset by the user. Timed bin data is collected between user-defined start and stop dates and times.

Contents of the counters can be quickly displayed as a bar graph on the LCP by selecting Loggings from the Quick Menu. The user can select trending Continuous bin, Timed bin, or Comparison of Continuous and Timed bins.

Trending data can also be downloaded using MCT 10 where it can be viewed, stored , or pasted into a spreadsheet for further analysis.

Features	Benefits
• Continuous and timed data collection	• A long term analysis of the system or a detailed study of a specific time of operation can be performed
• Simplifies the system analysis	• Eliminates the need for data recorders
• Can be used in combination with Energy Box 2 software to estimate energy savings	• Provides a comparison of actual savings verses estimated savings
• Programming is quick and easy with software	• Saves time

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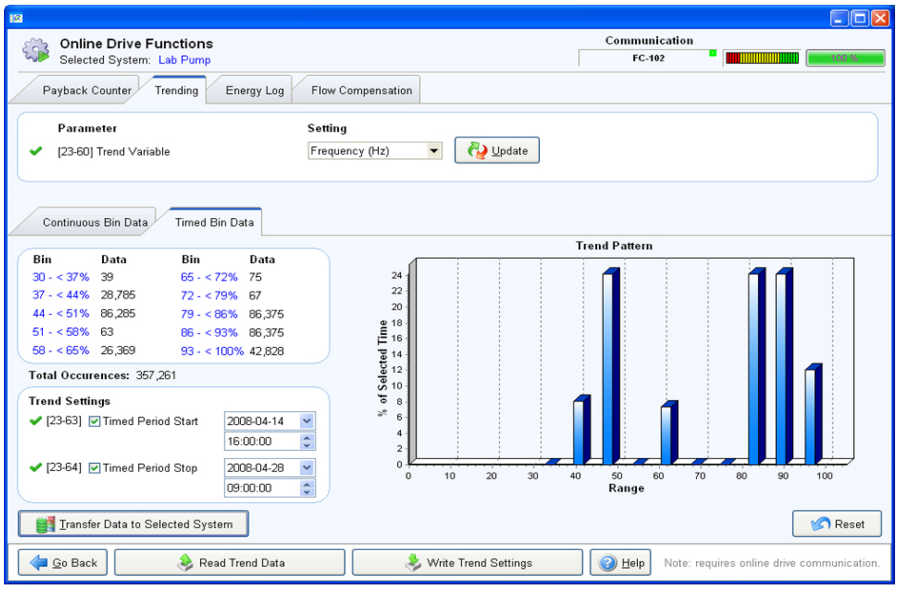
Trending and VLT® Energy Box

The trending feature provides a quick overview of the system operation and can be combined with the Danfoss VLT® Energy Box software for a detailed view of the energy use of a system.

Communication is established between the frequency converter and the software with a USB connection or through the drive serial communication port via an RS 485 converter. Energy Box can be used to set the trending variable and time interval for collecting Timed Bin Data.

Energy Box can read the results and transfer data to a selected system in the software. Continuous or Timed Data can be transferred from the drive to the software for viewing and for energy analysis.



Bin data representing the system speed (Hz or RPM) is converted into a load profile or duty cycle by the VLT® Energy Box program. This data can help improve the accuracy of future energy analyses.

Programming is quick and easy

The drive software makes programming the trending feature quick and easy by choosing Time Based Function Group 23, under the Main Menu and selecting 23-6* Trending.

Par.#	Description	Settings		Comments
		Factory setting	Recommended setting	
23-60	Trend Variable	kW	[0] kW [2] Hz	Chose the desired operating variable to be monitored. For use with VLT® Energy Box, Hz is the required setting.
23-61	Continuous Bin Data (Array of 10 counters)			Each of these indexed parameters contains ten bins for recording the trend data. Each second the drive determines the value of the Trend Variable and increments the counter in the appropriate bin. This data can be read using the drive's keypad, MCT 10 or VLT® Energy Box.
23-62	Timed Bin Data (Array of 10 counters)			
23-63	Timed Period Start			Set the date and time when Timed Trending starts and stops.
23-64	Timed Period Stop			
23-65	Minimum Bin Value (Array of 10 values)	0%, 10%, 20% ... 90%	Enable	This array variable allows the data collection bins to be customized to meet the needs of the application. Counter default settings are 10% multiples. Interval sizes are adjustable and do not have to be equal.
23-66	Reset Continuous Bin Data	Do not reset	[1] Do reset	Select Do Reset to reset all values in Continuous Bin Data. After reset the value returns to the default value, Do not reset.
23-67	Reset Timed Bin Data	Do not reset	[1] Do reset	Select Do Reset to reset all values in Timed Bin Data. After reset the value returns to the default value, Do not reset.
0-79	Clock Fault	Disabled	[1] Enabled	Select Enable to warn that the drives Real Time Clock is not running. This is important when the drive does not have the optional Battery Backed-up Real Time Clock.

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