



Welcome to System 1

Version 23.2 [Dec 2023]



System 1
Machinery Management



 **Bently Nevada**

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Welcome

Bently Nevada is pleased to present System 1 version 23.2, with new capabilities (Figure 1).

Users upgrading to version 23.2 will benefit from the many capability enhancements to effective outcomes, which are summarized below.

S1 System 1 v23.2 Features

Improved Productivity

Replication Enhancements

- Support Bi-Directional Configuration Replication
- Replicate Display changes on Uni-Directional and Bi-Directional setup
 - HMI
 - Performance Maps

Database Management



- Auto Archiving

Alarming Enhancements

- Auto Suppress Noise Events
- Notification on data loss

Configuration Enhancements

- Software nX Vector measurement



Edge Devices Monitoring

Orbit60

- Speed channel waveform support in System 1
- Integrated waveform configuration in System 1 for Orbit 60 channels
- Dynamic Pressure channel waveform support in System 1

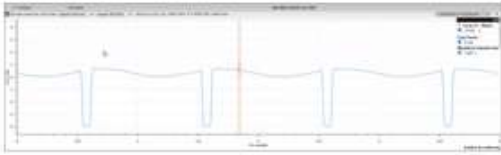
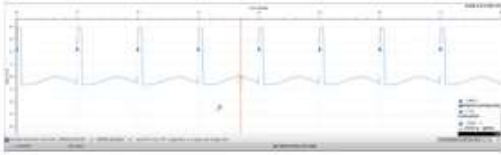


Figure 3.1-1 System 1 23.2 Features

Bently Nevada remains focused on delivering the world's premier plant-wide machinery management software through bi-annual product releases. For a detailed overview of System 1, please visit the [website](#).

Thank you,



Jeff Sipek, Product Manager

On behalf of your System 1 Leadership and Development Teams

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1. SYSTEM 1 V23.2 FEATURE OVERVIEW

Table 1-1: System 1 v23.2 – Improved Productivity

Improved Productivity		
Replication Enhancements		
Bi-directional Config Replication	System 1 allows Bi-directional replication of Configuration data. Users can edit Tx database configuration from the Rx server and vice versa. This allows users to securely modify configuration from the business network.	3.1.1
HMI & Performance Map Replication	System 1 allows replication of Display changes in Uni-directional and Bi-directional setups. The Display changes include: <ul style="list-style-type: none"> - HMI diagrams - Performance Maps 	3.1.2
Database Management		
Auto Archiving	System 1 allows users to schedule automatic archiving of database configuration, events, and data on a specified date at required intervals.	3.2.1
Alarming Enhancements		
Auto Suppress Noise Events	System 1 automatically suppresses events that enter and exit several times in a short duration.	3.3.1
Enable Data Loss Notification	System 1 notifies users through system health events when data for a device is not being received or stored in the database.	3.3.2
Configuration Enhancements		
Software nX Vector measurement	System 1 allows addition of nX Vector (SW) measurements on Sync Waveforms	3.4.1

Table 1-2 : System 1 v23.2 – Edge Devices Monitoring

Edge Devices Monitoring		
Orbit 60		
Speed channel waveform support in System 1	Users can add Sync and Async waveform under speed channel and troubleshoot problems related to shaft imperfections or installation.	4.1.1
Integrated waveform configuration in System 1 for Orbit 60 channels	System 1 allows users to integrate acceleration and velocity waveform and then send configuration to CMM. CMM can provide waveform with or without integration simultaneously.	4.1.2
Dynamic Pressure channel waveform support in System 1	System 1 allows users to add Sync and Async waveforms under dynamic pressure channel and send configuration to CMM.	4.1.3
Recip Impulse Acceleration Channel	System 1 displays Direct and Bias measurements data for the Recip Impulse acceleration channel which is configured in Orbit 60 device.	4.1.4

2. VERSION SUPPORT & OPERATING SYSTEM COMPATIBILITY

System 1 follows a semi-annual release cadence with targeted releases in May and November of each year. Versions are fully supported for a minimum of two years from the published date of availability (Refer System 1 Datasheet).

New Versions of System 1 benefit from:

- Compatibility with the latest Microsoft Client & Server Operating Systems
- Client backwards compatibility to previous versions under support (23.2 Client to 22.1 Server DB)
- Database upgrade from previous versions released within last 3 years (21.1→23.2)
- Security patch and update testing for the latest available version
- Bug fixes included in the latest available version.
- Standard technical support with escalation to engineering as required.

Versions no longer supported:

- Standard support is provided for common FAQ type questions, but users are encouraged to update software to the latest version to benefit from new features, OS (Operating System) compatibility, and bug fixes.

Table 2-1: System 1 Version Support & OS Compatibility Matrix

System 1 Versions & Support			Windows Server OS				Windows Client OS (64bit)		
Version	Available	End of Support	2022	2019	2016	2012 R2	11*	10**	8.1 U1
23.2	Nov 2023	Nov 2025	✓	✓	✓		✓	✓	
23.1	May 2023	May 2025	✓	✓	✓		✓	✓	
22.2	Nov 2022	Nov 2024	✓	✓	✓	✓	✓	✓	✓
22.1	May 2022	May 2024	✓	✓	✓	✓	✓	✓	✓
21.2	Nov 2021	Nov 2023		✓	✓	✓		✓	✓
21.1	May 2021	May 2023		✓	✓	✓		✓	✓

*Windows 11 version compatibility will track Microsoft’s published release and support model. The latest version of System 1 will be tested and supported on all versions of Windows 11 under support as published on their website based on the System 1 version’s published date of availability.

System 1 v23.2 (Windows 11 Pro/Enterprise 22H2, 21H2)

System 1 v23.1 (Windows 11 Pro/Enterprise 22H2, 21H2)

System 1 v22.2 (Windows 11 Pro/Enterprise 21H2)

System 1 v22.1 (Windows 11 Pro/Enterprise 21H2)

**Windows 10 version compatibility will track Microsoft's published release and support model. The latest version of System 1 will be tested and supported on all versions of Windows 10 under support as published on their website based on the System 1 version's published date of availability.

System 1 v23.2 (Windows 10 Pro/Enterprise 22H2, 21H2)

System 1 v23.1 (Windows 10 Pro/Enterprise 22H2, 21H2)

System 1 v22.2 (Windows 10 Pro/Enterprise 22H2, 21H2, 21H1)

System 1 v22.1 (Windows 10 Pro/Enterprise 21H2, 21H1, 20H2)

System 1 v21.2 (Windows 10 Pro/Enterprise 21H1, 20H2, 2004)

System 1 v21.1 (Windows 10 Pro/Enterprise 20H2, 2004, 1909)

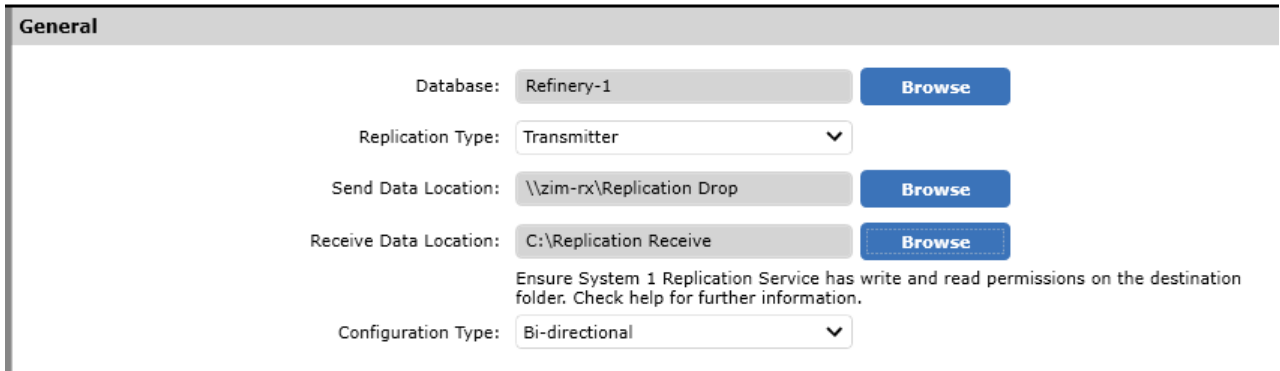
3. IMPROVED PRODUCTIVITY

3.1 Replication Enhancements

Replication Enhancements video located in Bentley Nevada Tech Support Training Library
[Valid M&S Agreement Required](#)

3.1.1 Bi-directional Configuration Replication

System 1 v23.2 now supports Bi-directional replication of configuration changes. Users need to enable Bi-directional replication on the Tx and the associated Rx database. Bi-directional replication replicates only the configuration changes from Rx to Tx and vice versa. Data and events are not replicated from Rx to Tx. To perform Bi-directional replication, System 1 and database versions on Tx and Rx must be 23.2 or later.



General

Database: Refinery-1

Replication Type: Transmitter ▼

Send Data Location: \\zim-rx\Replication Drop

Receive Data Location: C:\Replication Receive

Ensure System 1 Replication Service has write and read permissions on the destination folder. Check help for further information.

Configuration Type: Bi-directional ▼

Figure 3.1-1 – The General section of the Database Replication tab in Database Manager has been updated to include two data locations and the ability to configure Configuration Type.

Users can perform most of the configuration operations from the Rx database, except a few which are restricted. The following configuration operations are restricted from the Rx:

- Add and delete assets and devices.
- Device firmware upgrades
- Device synchronization
- Change IP addresses and credentials.
- Add, edit, or delete device states.
- Ranger Pro sensor replacement
- Deploy Decision Support rules to the Tx

- Decision Support rules can only be deployed to the Rx and from the Rx database.

To make edits on either Rx or Tx database, a request needs to be sent using the new lock context menu in order to put the database in edit mode. The new lock context menu is available only for Bi-directional databases. The lock icon provides a context menu with these three options: Allow Configuration Edits, Allow Display Edits, and Lock/Unlock Configuration. The context menu also shows configuration and display mode statuses: Edit Mode or Read-only, at the bottom.

Database must be in Configuration edit mode to make changes to the Configure workspace and Display edit mode to make changes to the Display workspace. After the database enters the Configuration edit mode, the Lock/Unlock Configuration functionality works the same as previous release.

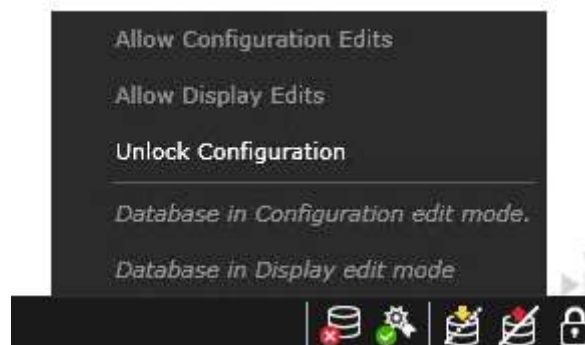


Figure 3.1-2 – The lock icon now displays a context menu for bi-directional databases.

3.1.2 HMI & Performance Map Replication

System 1 v23.2 allows users to replicate HMI diagrams and performance map configurations. This is supported for both Uni-directional and Bi-directional replication. To replicate display changes, select the Include Display Changes check box under Replication Settings on the Tx database. This option replicates all changes made to HMI diagrams and performance maps.

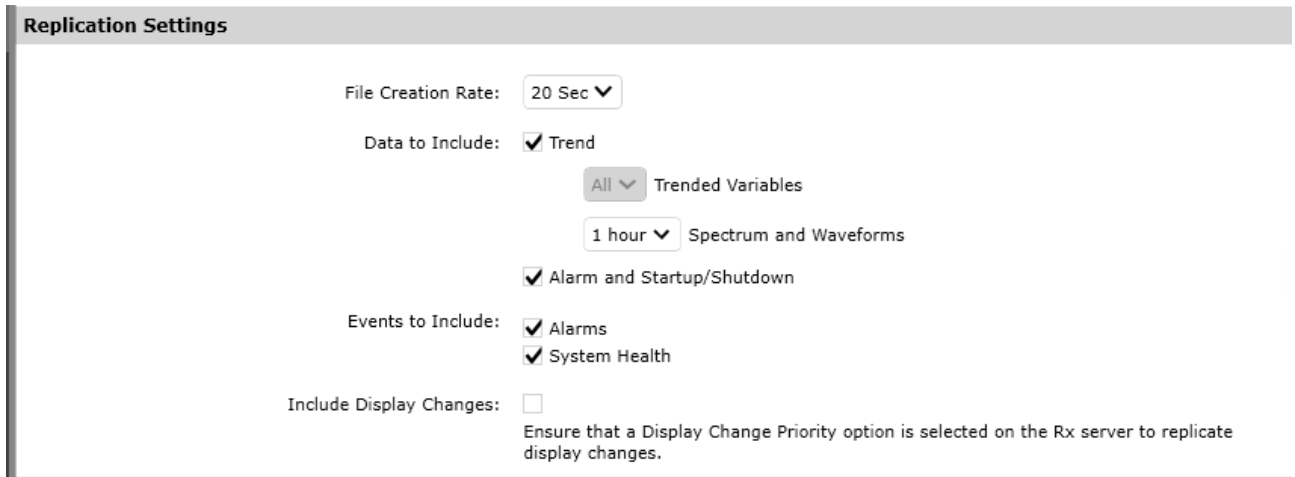


Figure 3.1-3 – The Replication Settings section of the Database Replication tab in Database Manager has been updated for Tx databases to add the new Include Display Changes option.

On the Rx side, in case there are conflicting display changes between Tx and Rx, the user needs to choose a Display Change Priority option on the Rx to resolve the conflict. When the “Take Tx changes” option is selected, the changes on the Tx are given priority and it overwrites the Rx changes. When the “Ignore Tx Changes” option is selected, the Rx changes are retained, and Tx changes are ignored. Newly added HMI diagrams and performance maps are replicated regardless of the Display Change Priority selection. Tx deletions are only replicated if the priority is set to “Take Tx Changes”.

Figure 3.1-4 – The Replication Settings section of the Database Replication tab in Database Manager has been updated for Rx databases to add the new Display Change Priority option.

Additionally, the Replication Config Retransmit Tool now allows retransmitting Display Configuration data as well as standard Configuration data.

Figure 3.1-5 – The Replication Config Retransmit Tool now includes a new Display Configuration Sequence ID property to include display configuration data in a retransmit operation.

3.2 Database Enhancements

Database Enhancements video located in Bently Nevada Tech Support Training Library

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3.2.1 Auto Archiving

System 1 v23.2 allows users to auto archive configuration, events, and data at regular intervals. Users need to specify a location to store the archives. To view the archive data, open the archive in System 1 in the same way as a machine audit file. Multiple machine audit files and archives can be attached to a database, as long as the archive or audit file belongs to same database.

To schedule Auto Archiving:

1. In System 1 Database Manager, under Archive tab, select the “Enable” check box for the databases you want to archive.
2. Under the “Save Archive to” column, browse and choose the location to store the archive.
3. Under the “Run Auto Archive Every”, “Day of Month” and “Start Time” columns, specify the auto archive frequency, archive creation day and time.

Database Name	Enable	Save Archive to	Run Auto Archive...	Day of Month	Start Time	Last Auto Archive...	Last Auto Archive Result	Next Auto Archive...	Store Disk Space Needed	Destination Disk Space Needed
Pulson Energy Man...	<input checked="" type="checkbox"/>	E:\SA...	1 Hour	15	05:00 PM	11/15/2023 5:00...	Successful	11/15/2023 5:00...	0.04 GB	0.02 GB
Oil And Gas Mark...	<input checked="" type="checkbox"/>	E:\SA...	1 Hour	25	07:00 PM	11/15/2023 7:00...	Failed	11/15/2023 7:00...	0.18 GB	0.03 GB

Figure 3.2-1 Auto Archive

4. The “Last Auto Archive Performed on” column shows the date when last Auto Archive was attempted.
5. The “Last Auto Archive Result” column shows the status of last archive attempted: Not Started, In Progress, Successful, or Failed. Click the status to view detailed information.
6. The “Next Auto Archive Scheduled on” column shows the date when Next Auto Archive is scheduled based on the settings done.
7. The “Store Disk Space Needed” column shows the disk space required to create temporary files in the System 1 Store folder.

8. The "Destination Disk Space Needed" column shows the disk space required to create archive files at selected location in "Save Archive to" column.

3.3 Alarming Enhancements

Alarming Enhancements video located in Bently Nevada Tech Support Training Library

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3.3.1 Data Loss Notification

If System 1 does not historize or receive data from a device or a group of devices, it notifies the users through an email, if email notifications have already been configured. This helps users to take corrective actions and prevent data loss. System 1 performs checks at fixed time intervals and determines if Postgres is storing data for all the enabled devices. If not, then it checks if the data is being received from the device. Based on the investigation, System 1 logs a severity 3 event, either "Data not stored" or "Data not received". Also, in the Database Manager, the Overall Database Health column displays the following message, "Data is not being historized for some enabled devices". The email notification includes detailed information about the event.

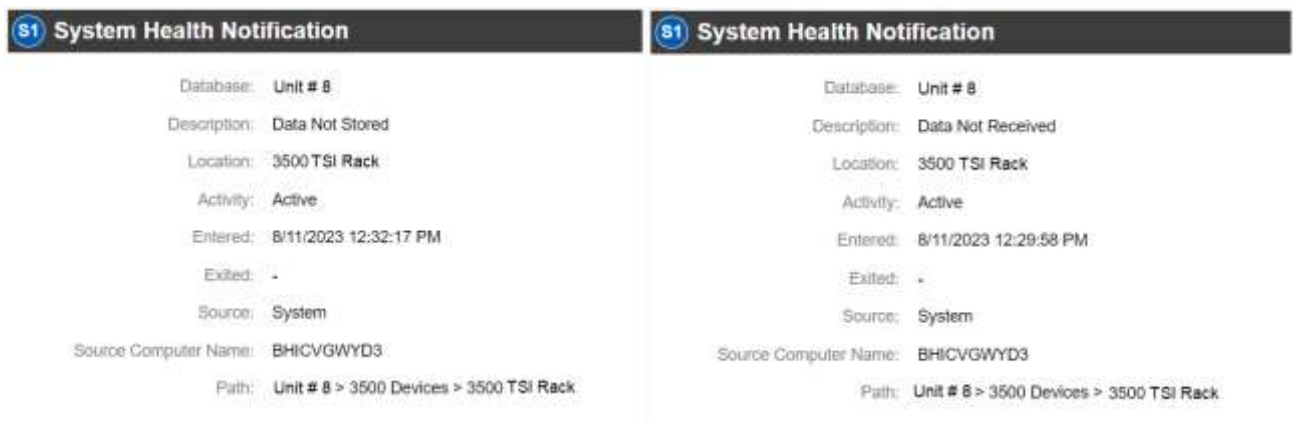


Figure 3.3-1 System Health Notification for Data Loss

3.3.2 Auto Suppress Noise Events

When a particular event is logged several times in a short period of time, a large number of event occurrences, also known as noise events, are displayed on System 1 event list. Critical events may be overlooked due to these large number of noise events and at times cause performance issues. The Auto Suppression feature suppresses these noise events automatically. When an event enters, exits, and then re-enters within a time span of one minute, System 1 automatically suppresses the event and logs an entry under the Suppressed tab. When the event remains stable in a particular state (cleared or active) for at least a minute, the auto-suppression gets revoked. Manual suppression takes

precedence over auto suppression. Users may contact Bently Nevada Tech support to disable auto-suppression or change the suppression duration for their setups.

Alarms	Status	System Health	Suppressed	Event Type	Source	Suppression Entered	Suppression Duration	Suppressed By	Suppression Exited	Exited By
Auto		Instrumentation		Channel Not OK	Instrumentation	25-10-2023 13:52:33	1 min	System	25-10-2023 13:53:33	System
Auto		Instrumentation		Channel Not OK	Instrumentation	25-10-2023 12:33:51	1 min	System	25-10-2023 12:34:51	System
Manual		Machina Alarms / Instrumentation / System Health / Transient / User Initiated		N/A	--	25-10-2023 12:06:03	10 s	BH1-MASTER/ibharrac	25-10-2023 12:06:34	BH1-MASTER/ibharrac

Figure 3.3-2 Auto Suppressed Noise Events

3.4 Configuration Enhancements

Configuration Enhancements video located in Bently Nevada Tech Support Training Library

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3.4.1 Software nX vector measurement

System 1 version 23.2 supports software nX vector measurements for all devices. Users can add software nX vector measurements through the Add Trended Variable dialog in the Configure workspace. Each nX measurement needs to be associated with a synchronous waveform. nX measurement provides amplitude and phase information of the configured order. System 1 calculates historical data samples for nX variables based on synchronous waveforms' stored data. The nX variable provides deeper insights that help diagnostic engineers to troubleshoot machine issues.

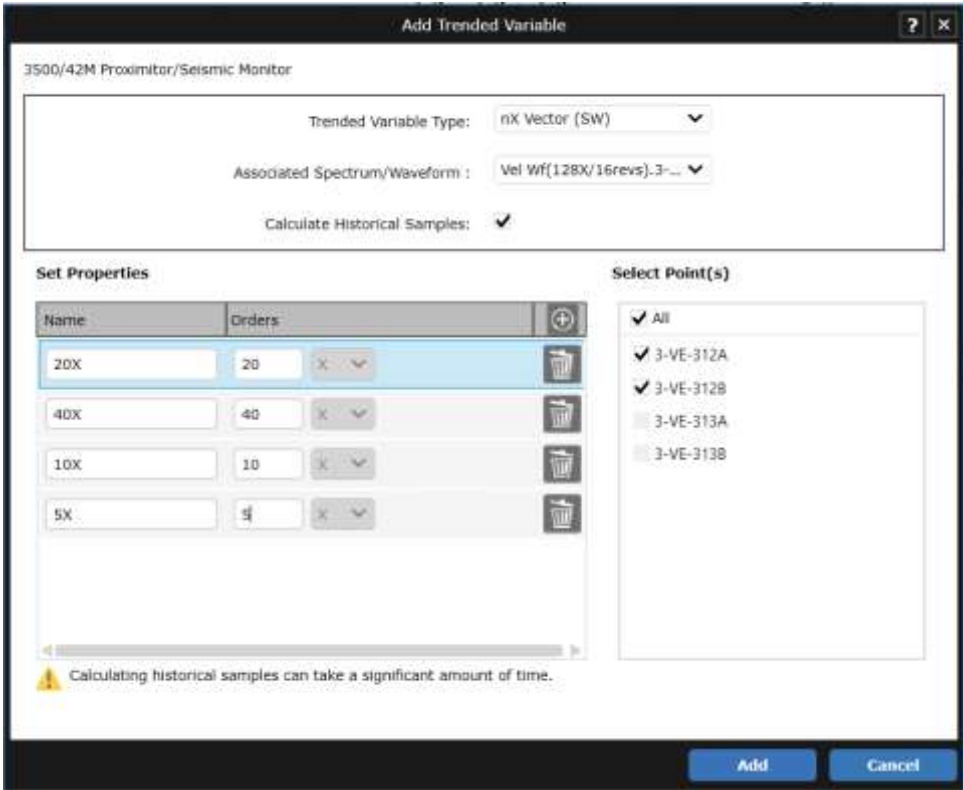


Figure 3.41 software nX vector configuration

4.DEVICE CONNECTIVITY

4.1 Orbit60

Orbit60 Enhancements video located in Bently Nevada Tech Support Training Library
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4.1.1 Speed channel waveform support in System 1

System 1 23.2 allows users to add Synchronous and Asynchronous waveforms under a speed channel. The waveform is not added in the crash file mode in CMM by default. However, when the device is added in System 1, depending on the CMM utilization, user can add waveform under the channel. Looking at the speed waveform in System 1 helps to identify shaft imperfections and installation issues. The user can set Threshold and Hysteresis values for the speed channel by referring to its waveform.

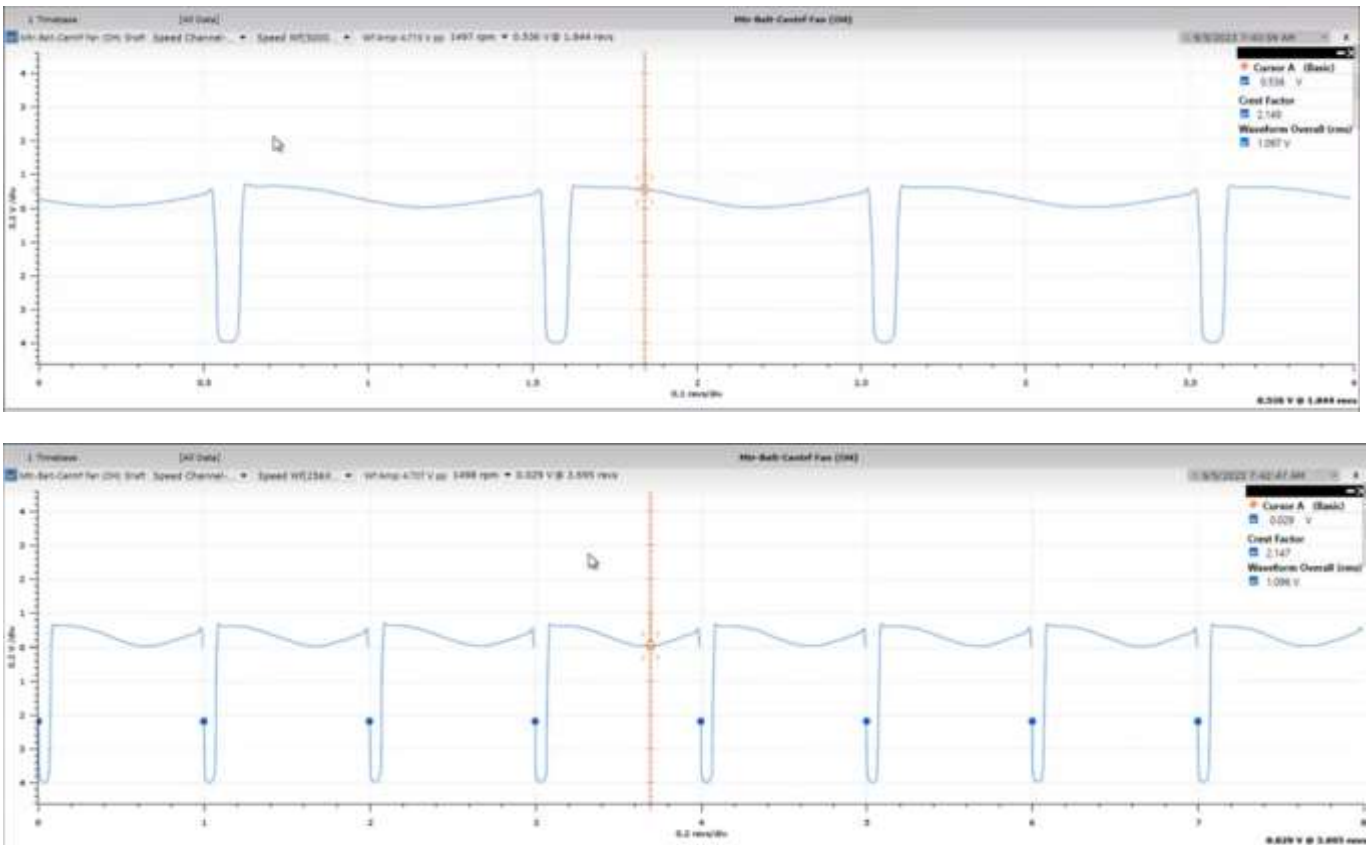


Figure 4.1-1 Speed Channel Waveform

4.1.2 Integrated waveform configuration in System 1 for Orbit 60 channels

System 1 23.2 allows integration of acceleration and velocity waveforms by selecting the Integrate checkbox. The configuration is sent to the CMM, which then returns the integrated waveform back to System 1.

4.1.3 Dynamic Pressure waveform support in System 1

System 1 23.2 allows users to configure Synchronous and Asynchronous waveforms under the Dynamic Pressure channel. The configuration is sent to the CMM, which then returns the waveform back to System 1. Users can visualize the waveform in the Display > Plots workspace. Users can add software trended variables by associating configured dynamic pressure waveforms.



Name	Rate	Unit	Channel	Channel Type	Measurement	Generate Type	Load	Active	Type	Integrated	Phase	Sample Rate	Sample per Rev	Number of Revs	Operational Lines	Operational Results	Waveform Structure	Structure	Associated Speed	Speed Units	Max Speed	Min Speed	Number of...	Max Allowed
Dynamic Pressure Channel	100 Hz (1000 Lines)	g	Dynamic Pressure Channel	Pres	WE3000 Hz	None	g	✓	Resonant	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dynamic Pressure Channel	100 Hz (1000 Lines)	g	Dynamic Pressure Channel	Pres	WE3000 Hz	None	g	✓	Resonant	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Figure 4.1-2 Dynamic Pressure Channel waveforms

4.1.4 Recip Impulse Acceleration Channel

System 1 23.2 allows users to view Recip Impulse Acceleration Channels’ configuration in the read-only mode. Presently, Direct and Bias measurements are added under Orbit 60 device protection configuration. Users can map the Impulse acceleration channel to a reciprocating compressor machine and view measurement data in machine train diagram and other plots.

DECISION SUPPORT IS NOW AVAILABLE TO DOWNLOAD

[Valid M&S Agreement Required](#)

Starting with System 1 version 23.2, Decision Support Developer will be included with all new orders of System 1. Decision Support and System 1 both remain as separate products. However, they will be delivered through the same download folder in Flexera. Decision Support is now part of the System 1 package, and therefore does not require a separate license for installation. This excludes the Decision Support Analytics (formerly known as InsightPaks) and the DS Analytics library, which also remains as a separate commercial product. For more information on this change, contact your sales manager.

ONLY APPLICABLE WHEN UPGRADING FROM VERSIONS PRIOR TO 22.1

! License Changes !

If you upgrade from System 1 21.2 or prior, the existing licenses are not visible in the Licenses tab because of the Publisher Name change to "Baker Hughes". Therefore, before you install the latest System 1 version, return your existing licenses to the Licensing Portal. After the upgrade, register the License Server again using your existing activation code and relicense System 1. For more details, refer to the System 1 Licensing User Guide.

! Postgres version upgrade !

System 1 version 22.1 onwards supports Postgres 14 as the historian. Databases on Postgres 11 need to be upgraded to Postgres 14.

While upgrading to Postgres 14, it is recommended to create a backup before installing the latest System 1 version.

When you upgrade to PostgreSQL14 on System 1 22.1 or later, rollback installation to earlier System 1 versions is not allowed. Rollback is only possible by restoring VSS/Acronis backup.

To upgrade the historian from Postgres 11 database to Postgres 14, launch the Database Manager tool and click "Upgrade PostgreSQL Database".

! Proficy Obsolescence !

Proficy is no longer supported as historian. Users need to migrate their database from Proficy to Postgres.

Users must migrate Proficy databases to PostgreSQL to upgrade to System 1 22.1 or later.

This is applicable for customers who have an older System 1 version with Proficy databases. This does not impact customers who already have PostgreSQL databases as historians.

For more details, please refer to System 1 Help.

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