TSI BUFFER DOWNLOAD

TECHNICAL BULLETIN TCC-122 (US)

Contents

Intent

The purpose of this document is to provide information about changes made in FMS 5 that related to buffer download and general instructions for how to use buffer download feature.

What Changed in FMS 5

The changes will affect TSI Remotes (except Model 7110) and TSI Remotes with Pump only.

Here is the list of major changes.

- FMS will log data into database using the device time stamp. The real-time event log will still use system time. All buffer data related event log will use device time.
- Buffered data process will not affect the real time monitoring process and will not trigger any digital output in case of an alarmed condition based on real-time settings.
- Buffer download process is disabled in default settings. Users can enable the feature and can set buffer size through Sample Points Properties.
- FMS will sync device time with system time as needed.
- FMS will clear device buffer and restart counting as needed.

System Changes

Real Time

FMS will log counts data/analog values into database using device time.

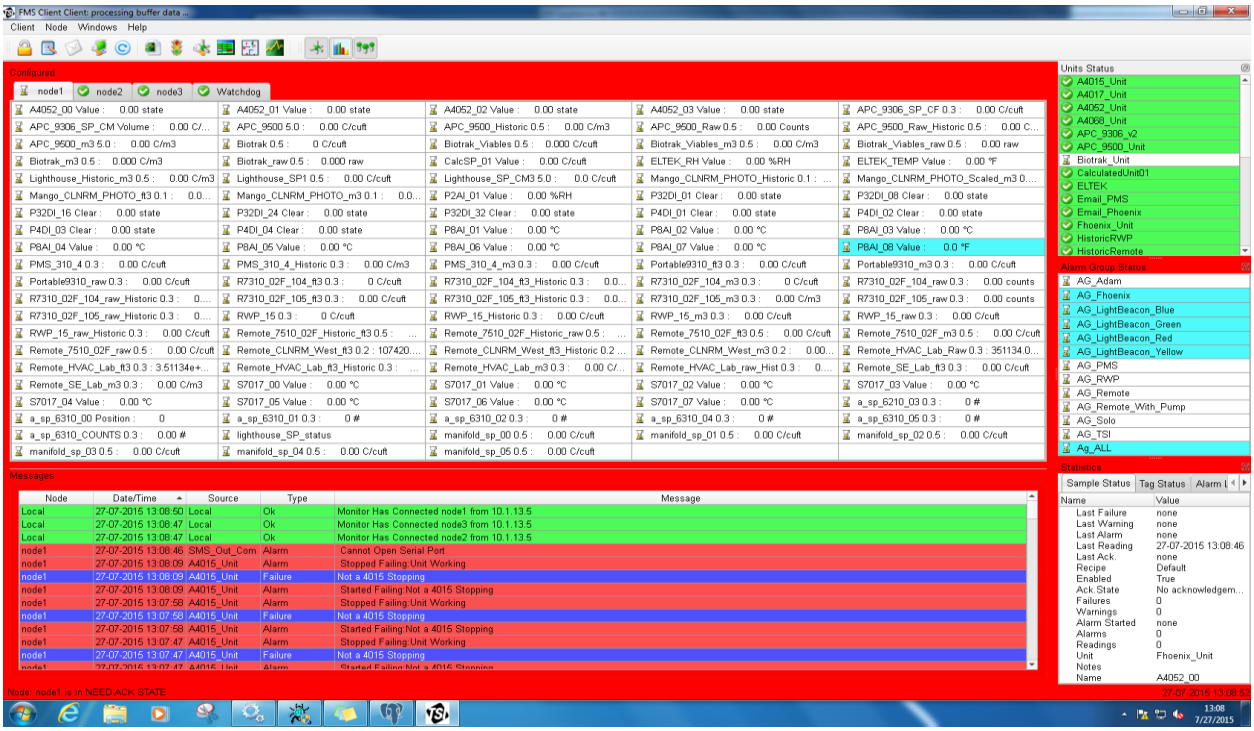
***Note**: All events log and messages related to real-time data will always use system time.*

Buffer Process

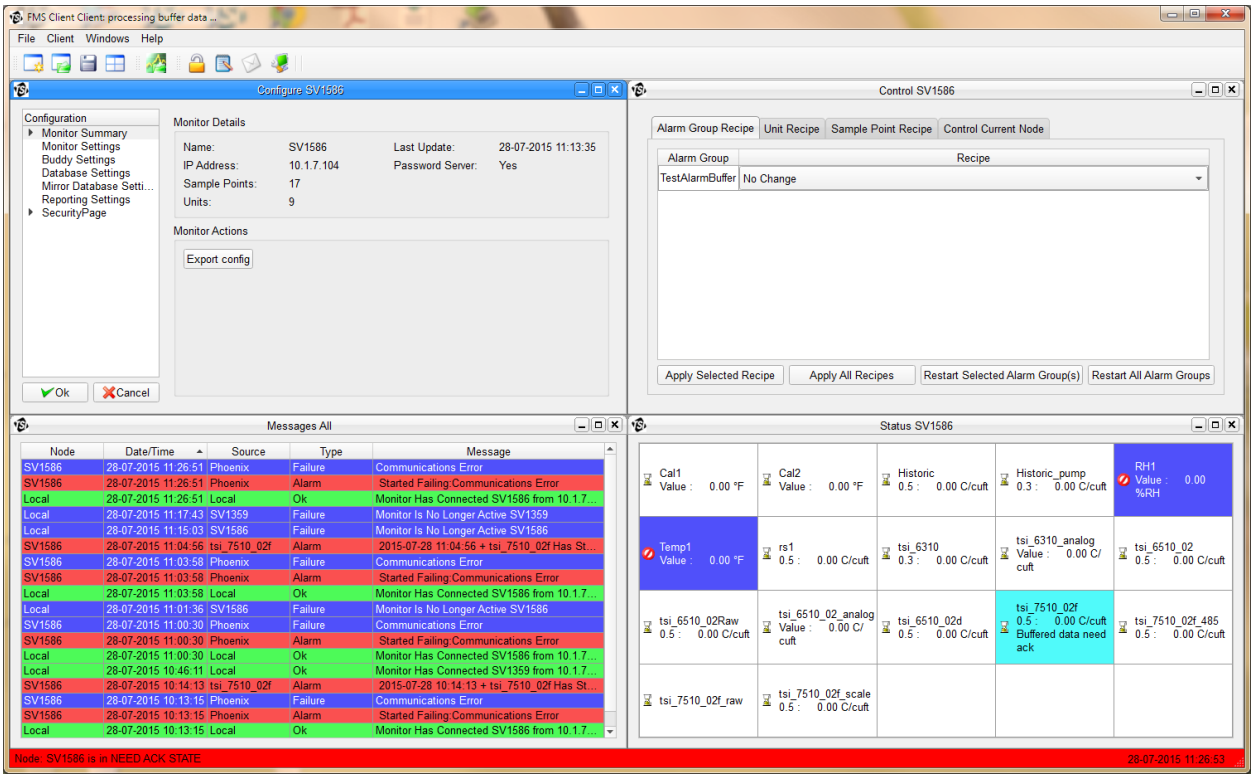
- FMS will log everything into the database using device time.
- Alarmed condition will be logged into the database, but will not trigger digital output as per real time data Users can acknowledge the alarm condition later on just as real time.
- Alarmed condition is checked against current settings and all related messages are hidden.
- When the buffer process is ongoing on one Monitor node, any Client connected to that Monitor node will post a message and change background color to red to warn the user.

Important Note
***Do not** make any configuration changes or changes that require Monitor restart at this time until buffer download process is completed.*

Buffer Download is in Process, Pharma Mode



Buffer Download is in Process, Standard Mode



Driver Changes

FMS will sync device time with system time and clear the device buffer for the following conditions.

- A new device is configured and connected to the system.
- A backup device is connected to the system to replace an existing same model device.
- User enables/disables Sample Point, Unit or Communication through Client, Applying Recipes in Control or via the Recipe Switch Driver.

Real Time

- Post data values to the Monitor using device time.
- FMS will sync device time with system time between 3:15 am and 3:20 am if the device time is off by 6 seconds or more compared with system time.

Buffer Process

- FMS will process buffered data as needed during the period of time when waiting for real-time data.
- Post data values to the Monitor using device time.

Buffer Download Process

Buffer download process is designed to recover data due to communication error or system breakdown. When communication is recovered or the system is restarted, FMS will determine if buffer download is needed based on user settings and device status. The process will retrieve and post data records in the device buffer until a duplicate record is found in database.

When buffer download process starts, FMS will post a message to warn the user.

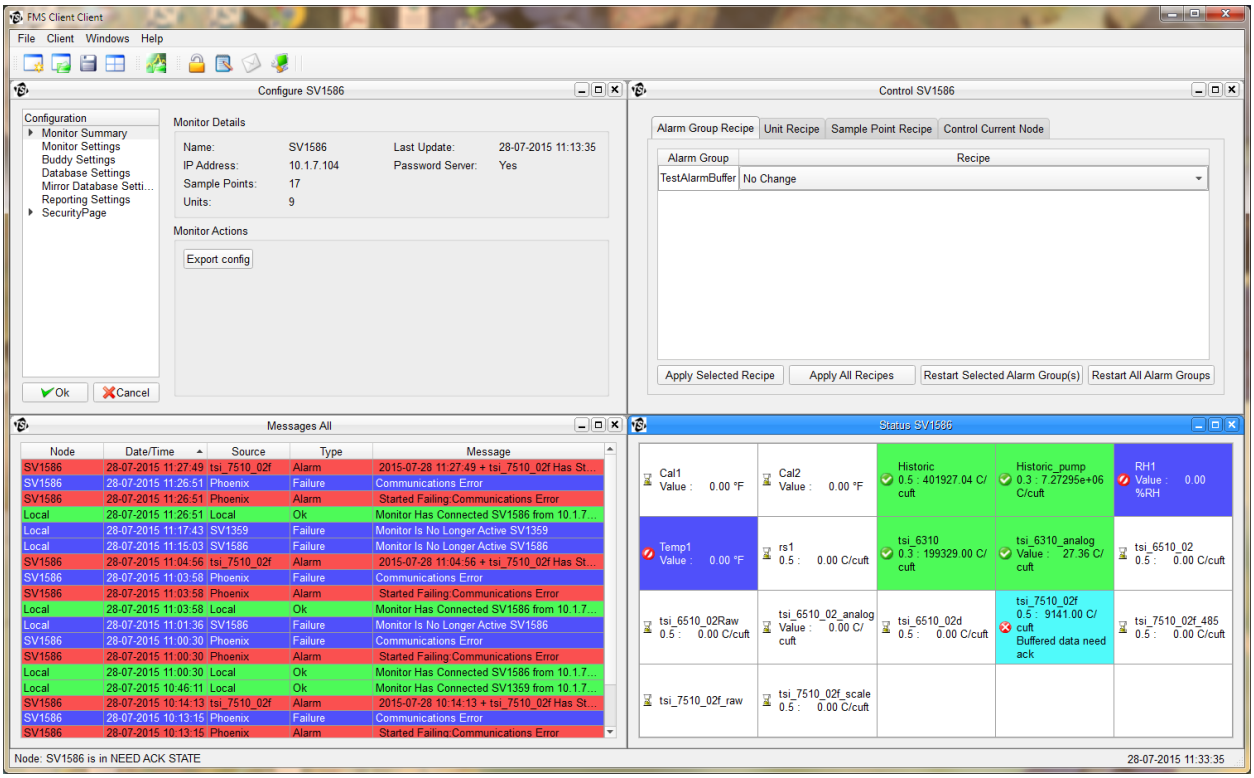
Important Note
***Do not** make any configuration changes or changes that require Monitor restart in FMS when buffer download starts.*

You can make changes when buffer download completes.

If buffered data is in an alarm condition based on current settings, FMS will log all information into database without triggering any digital output. The user can acknowledge alarmed buffer data later on just as alarmed real-time data. The sample point status will indicate that there is buffered data requiring acknowledgment.

Buffer download process will not affect real-time monitoring and status.

Buffer Data Need Acknowledge



Buffer Size

The valid buffer size is from 1 to 3000 and FMS will sync buffer size for all Sample Points based on same Unit.

Note

The actual downloaded buffer data count will be less than 3000 even though the setting is 3000. Real-time data process takes the priority and will overwrite the buffer location when FMS processes buffer data. It takes about 9 minutes for TSI Remotes using TCP to complete full buffer download. For TSI Remotes with Pump (RWP) using TCP, it takes about 22 minutes to complete full buffer download. For RS485, the process may double the time to complete full buffer download at least. The times are based on a 60 seconds sample interval.

For example, if it takes 20 minutes to download a RWP buffer at one minute sample intervals you will lose about 20 records in device buffer. The actual buffered records will be 2980 even though the buffer size is set at 3000.

Expected No Buffer Download Condition

FMS will not perform buffer download process right after the following conditions even though buffer download is enabled by user.

- A new device is configured and connected to the system.
- A backup device is connected to the system to replace an existing same model device.
- User enable/disable Sample Point, Unit or Communication through Client, Recipe Switch in Control or Recipe Switch Driver.

A New Device is Configured and Connected to the system

After user saves the configuration for the new device, FMS will restart and the process for the new device will be as follows.

- FMS reads the serial number of the new device.
- FMS syncs the new device time with system time and clears the new device buffer.
- FMS goes to real-time monitoring state without buffer download process.
- FMS will perform buffer download process if the new device loses communication or system restarts afterwards.

A Backup Device is Connected to the System

After user connects backup device, FMS will recovers the communication and the process for the backup device will be as follows.

- FMS reads the serial number of the backup device.
- FMS syncs the backup device time with system time and clears the backup device buffer.
- FMS goes to real-time monitoring state without buffer download process.
- FMS will perform buffer download process if the backup device loses communication or system restarts afterwards.

User Enable/Disable Sample Point, Unit or Communication through Client

After user saves the changes, FMS will restart and the process for device related to user changes as follows.

- FMS syncs device time with system time and clears device buffer.
- FMS goes to real-time monitoring state without buffer download process.
- FMS will perform buffer download process if device loses communication or system restarts afterwards.

User Enable/Disable Unit through Recipe Switch in Control or Recipe Switch Driver

After the recipe is triggered, FMS stops the communication to the related device. When recipe is cleared, FMS will do the following.

Important Note

Disabling the Unit (NOT the Sample Point) is the TSI recommended approach when removing a device for calibration or maintenance.

This approach ensures any data logged by the device during calibration or maintenance is NOT buffer downloaded to FMS on reconnection.

- FMS syncs device time with system time and clears device buffer.
- FMS goes to real-time monitoring state without buffer download process.
- FMS will perform buffer download process if device loses communication or system restarts afterwards.

User Enable/Disable Sample Point through Recipe Switch in Control or Recipe Switch Driver

After the recipe is triggered, FMS still has the communication to the device. FMS will not log data into the database for the disabled sample point. FMS will do the following when recipe is cleared.

- FMS will start to log data into database and real-time monitoring is resumed.
- **FMS will not perform buffer download process if device loses communication or system restarts. Instead, FMS will sync device time and clear device buffer. Then FMS will go to real-time monitoring state.**
- FMS will perform buffer download process if device loses communication or system restarts afterwards.

Database Tested for Buffer Download

PostgreSQL

There are no known issues for buffer download using PostgreSQL database.

MySQL

- Install MySQL following Installation Instructions for MySQL 5.1.39.
- Use MySQL administration tool to set sql-mode string as follows
  "**STRICT_TRANS_TABLES, NO_AUTO_CREATE_USER, NO_ENGINE_SUBSTITUTION, ANSI, ANSI_QUOTES**"

MSSQL through ODBC

FMS is tested on MSSQL Express 2005.

- Install MSSQL database.
- Create database for FMS.
- Create user for FMS database.
- Use administration tool to enable all ANSI related features for FMS database.

Note
For existing MSSQL database, please check the data table has columns "timedate" and "states" set as Primary Key.

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