MANCHESTER 1824
The University of Manchester

SPRINT enhancements

This document summarises the SPRINT software enhancements and fixes by release version. It is intended to help users identify what changed, when it changed, and whether a change may affect their existing projects or workflows.

For non-program-specific changes, refer to the general enhancements section. These notes describe enhancements for the current software release; because not every enhancement requires a version-number change, some changes may appear under the same release version.

Version 2.9-160 (08/06/2026)

- The input data table reports have been enhanced to display all data and can now be copied to Excel with correct alignment

Version 2.9-157 (21/04/2026)

- Additional feedback identifying which solver is being used in the network pinch analysis

Version 2.9-156 (28/10/2025)

- The stream data editor / excel interface becomes unstable in some situation
- The stream data editor Paste stream/Paste stream New would corrupt the stream data in some circumstances.

Version 2.9-155 (17/02/2025)

- Revision of support libraries

Version 2.9-154 (12/12/2024)

- Under some circumstances the cross pinch report would fail to identify some cross pinch mixing. This has been resolved
- The number of unit operation has significantly been increased. This is to permit unit operation to be used as placeholders when using the manual pinch design method in the Grid diagram when in “show pinch” mode. The basic concept is to add unit operation(s) above and below the pinch to represent the enthalpy change in each pinch design region. As exchanger matches are added the equivalent heatload is removed from the relevant unit operations. This method permits the exchanger and mixer location to remain in the correct design region when the network is partially completed.
- The “shift headload” function has been enhanced to include unit operations (DH based). This is to assist in moving heatload between unit operations and exchangers in “show” pinch” mode
- The unit operation editor has an additional facility to permit the specified enthalpy to be changed by a specified increment
- The default size of the Network editor can now be defined in response to the availability of increasingly high-resolution screens.

Version 2.9-153 (18/09/2024)

- The steam table interface in the utilities editor had issues which has been resolved.

Version 2.9-152 (12/09/2024)

- Unit operations can now only be placed on process streams

- The Exchanger physical properties can now be included in the Excel interface
- The stream physical properties can now be included in the Excel interface.
- There were some issues with the cross-pinch report which have now been resolved.
- The simple design initialisation has been enhanced to incorporate more options for the default utility selection. This is to accommodate the situation where there are multiple utilities which can now be selected based on thermal feasibility.

Version 2.9-148 (18/08/2023)

- In some circumstances the NLP optimisation would over constrain the maximum match heatload resulting in non-optimal results
- The user defined constraints under some circumstance fail to initialise properly leaving then deactivated. This has been resolved
- The simple network initialisation has been enhanced to permit the separate addition of either the utility or dummy process matches. This is to permit finer control of the initialisation. The simple initialisation too has been added to the Network editor.
- An issue relation to the function which sorts the network loop and paths into number the require the fewest exchangers first has been resolved this may influence previous optimisation results as the random selection during optimisation will change.
- A feature has been included to permit user to add notes to exchangers and streams to aid in project documentation
- Basic exchanger data can now be transferred by the excel interface

Version 2.9-146

- The Network Pinch MILP formulation has issues in some circumstances when there was segmented stream data. This has been resolved.

Version 2.9-145

- The block decomposition had issues relation to data internal corruption and failing to correctly identify block stream population. This has been resolved
- The stream data editor was not consistently refreshing the stream numbers. This has been resolved
- An issue with the NLP optimiser options editor has been resolved
- An issue relating to the exchanger editor on some version of windows has been resolved
- The cross-pinch report would give misleading result in some circumstances. This has been resolved.

Version 2.9-144

- The default stream film heat transfer coefficient has been changed from 2 to 0.6 kW/(m^2.K)
- The default utility topology has been changed from “Any” to “Parallel”
- The user defined pinched based on target temperature was using the incorrect value
- The Design grid now correctly used the line attribute in preferences
- The automated design initialisation was failing with utilities with zero heatload. This has now been resolved
- The HTML version of the network simulation report had been enhanced with links to enable easier navigation.

Version 2.9-142

- New Development environment libraries
- Restructure on-line help
- The Design grid now highlights utility streams with an alternative line style

- A facility has been added to permit custom reports to be generated in Excel. This is achieved using a user modelling language to extract the relevant data and send it to Excel

Version 2.9-141

- An issue relating to the foreign language support in the temperature range report resulted in the program termination. This has been resolved. In earlier version this section of the report can be omitted using the simulation report options.
- An issue relating to the "simple network initialisation" failing has been resolved
- The "Find feasible network "help text has been revised

Version 2.9-136

- The fouling models have been adjusted to permit negative fouling rates (self-cleaning) where applicable.
- Cleaning duration, factors and cost can now be specified on a per exchanger basis.
- Pure counter current exchangers can now have multiple shells. To different them from shell and tube exchangers, a new model category has been added of "Simple CC" has been included. Legacy datafiles will assume that the exchanger mode is "Simple CC".
- The exchanger cost laws have been simplified to permit costing of multiple shell pure counter current exchangers.
- Multiple shell exchangers can now be specified as either being in either series or parallel.
- The design optimisation can now include total life cost where the base design and fouling mitigation can be considered simultaneously (not ready)
- The exchanger template information can now be imported /exported to permit inclusion in other project files.
- Sensitivity tools have been added to the match calculator to examine the effect of various design parameters on the overall exchanger design
- This manual design grid and block grid were incorrectly numbering the stream
- There was an issue with the automated design initialisation if the utilities were not specified as the last streams. This has been resolved
- The match calculator exchanger T-H will now add a step-of line to indicate approximate shell requirement for 1-2 shell and tube models.
- The project datafiles can now be "saved" from within the flowsheet environment.
- The UA sensitivity tools and temperature control function has been added to the flowsheet environment.
- Mixers and branch numbers are now re-numbered into stream order
- The branched editor in the flowsheet editor has been modified to only show the branches on the selected stream. The flow fraction of a mixer outlet can no longer be specified
- Issues relating to network initialisation as the basis for SA optimisation have been resolved (Simple, Complex, Spaghetti)
- Multiple case analysis functionality has been temporarily with drawn from service due to multiple data handling issues. It is intended that this functionality will be re-activated in the next release
- An issue relating to utility limits not being correctly applied in network pinch analysis has been resolved

Version 2.9-134

- An issue with the initialisation of the stream data-Excel interface has been resolved

Version 2.9-133 (14/8/2018)

- Revision of support libraries

Version 2.9-132

- The grid diagram options have been enhanced to permit the temperature values to be moved relative to the location centre. This permits user to generate less clutters presentation images
- Internal changes to how grid diagram options are managed internally
- An issue relating to how the FT factor was determined for very large exchangers has been resolve
- Help on automated design initialisation and network initialisation for SA optimisation has been revised
- An issue relating to the “Save” function during fouling/cleaning optimisation was not working as expected. This has been resolved

Version 2.9-128

- The fouling profile had an issue with segmented stream data under certain issues this has been resolved
- A fouling rate profile utility has been added to the exchanger data editor

Version 2.9-127

- The copy image to clipboard utility has been added to the block decomposition grid.
- An issue relating to the exchanger defaults editor has been resolved

Version 2.9-126

- The detailed heat exchanger model had been disabled in the simulator. This has been re-enabled
- The network report options are now saved to the data file
- The pressure calculation option is now saved to the data file
- An issue with the stream properties editor resetting the editor status information when call from the stream data editor has been resolved
- An issue that prevented the network pressure report for being displayed has been resolved.
- Issues in managing the LOOPS and PATHS in the SA optimisation have been resolved
- An issue relating to the limit on the maximum number of network modifications termination the SA optimisation has been resolved.
- An issue relating to importation of stream data via the clipboard has been resolved
- An issue with utility data being re-initialised when accessed from the stream data editor has been resolved
- An issue relating to data corruption in network pinch resequencing has been resolved
- An issue relating to the grid diagram requiring a manual refresh after stream deletion using the cut tool has been resolved.
- An issue relating to network pinch when there were exchangers with segmented stream data on both the hot and cold side has been resolved
- An issue relating to reading multiple case file has been resolved.

Version 2.9-125

- Issue relating to the unit operation with enthalpy-based specification with linear stream data has been resolved
- The network temperature report has been enhanced to report any stream temperature that is outside of the supply and target temperature
- The stream data editor has been enhanced to have a direct Excel interface
- Additional network initialisation options have been added to the SA optimisation menu

- An issue relating to “linked” utility becoming corrupt when the stream data was sorted has bee resolved
- The interface to the external MILP solver had an issue in relation to “integer only” classes or problems (i.e. Loop and Path determination). This has been resolved
- The Loop and Path determination has been improved to avoid unnecessarily recalculations when the network structure is changed.

Version 2.9-123

- Issue relating to the software crashing when multiple instances were attempting to store diagnostics to the same file has been resolved
- The Optimisation of heat transfer enhancement had been deactivated; this has now been reactivated.
- An issue relating to the exchanger editor not displaying the correct page when an exchanger was added has been resolved
- An issue relating some loops and paths not being correctly generated has been resolved
- An issue with the stream properties data editor has been resolved

Version 2.9-117

- Issue relating to network pinch feedback message and termination criteria have been resolved
- Detailed exchanger model revision
- Exchanger editor updating issue resolved
- Exchanger match profiles on DFP can now be included/excluded
- Save/Save As dialogue revised to match MS office conventions
- Exchanger sort option enhanced
- Issue relating to reading the match cost matrix from the data file have been resolved
- A summary report has been added
- On-line help implanted for the match calculator
- On-line help enhanced for stream data /Excel interface
- Network LOOP and PATHS can now be identified. User facilities added to examine network objective function effects on altering heatload through a given LOOP or PATH.
- The “Shift Heat load” has been upgraded to consider any utility stream minimum or maximum limits
- On-line help upgraded with LOOP and PATH information
- SA optimiser upgraded to exploit LOOP and PATH information
- Linked utilities enhanced to include a constant offset value

Version 2.9-100

- Detailed exchanger model for HTC and pressure drop calculations implemented
- HTC enhancement (tube inserts/shell side option) added
- Fouling model revised to integrate over time (time dependent calculations)
- SA probability editor upgraded
- Fouling. Issue relating to how the cleaning was implemented have been resolved
- Issue relating to area-based exchanger with zero flowrate have been resolved
- TUA tables upgraded
- Network Simulation reported enhanced
- Issue relating location network elements when in grid mode have been resolved

- Design initialisation: Block grid issue has been resolved
- SA design options – default utilities added
- Grid layout issues
- On-line help relation to exchanger capital cost have been enhanced
- A hot key to switch between new and retrofit economic has been added (Alt+R)
- Fouling cleaning factors added for partial cleaning
- Additional fouling options and editor enhancements
- Revised detailed exchanger model
- Automated design total cost function revised to include operating hours
- Menu layout revised to conform to latest MS office style
- Issue relating to HTC calculations when determining duty from area when Ft is limiting have been resolved
- A utility has been added to investigate the effect change a match area over a range to determine the effect on heat load has been implemented
- SA network initialisation revised
- Issue relating to stream splitting with network pinch has been resolved
- SA user constraints enhance and added to SA initialisation functions

Version 2.9

- An issue relating to automated design initialisation has been resolved
- An Issue relating to the initiation of the internal MILP solver has been resolved
- An Issue relating to resequencing in network pinch has been resolved
- The exchanger cross pinch report gave misleading information when an exchanger crossed multiple pinches. This has been resolved.
- The ability to run SPRINT in batch mode from a script file have be improved
- Sensitivity table option has been extended
- General Editor Enhancements
- On-line help for fouling added
- Issue relating to match placement in grid mode have been resolved
- Fouling. minimum threshold temperature incorporated
- An issue relating to FT calculation in sensitivity tables has been resolved

Version 2.8

- An issue relating to exchanger fouling factor in targeting has been resolved
- An issue relating to calculating match HTC from installed area due to FT limitation – match would require additional shells
- Default fouling factor set to zero. Option added to ignore fouling factor values
- Total plant life cost optimisation objective has been added

Version 2.1

- An issue with the simplify network tool has been resolved.
- An issue with the stream data editor has been resolved.
- An issue with the match calculator has been resolved.
- User constraints can now be applied to the stochastic optimisation procedure.
- Multiple issues with the stream network editor have been resolved.
- Match heat transfer coefficient can now be calculated from installed area and heat load.
- Exchanger capital costing has been revised. Capital cost laws are now selected based on stream matching rules.
- An issue with data becoming corrupted in the network editor after optimisation has been resolved

- The network report now identifies invariant exchangers. (not on loop or path).
- An issue with the unit operation and network pinch has been resolved
- Network design can now be performed using Stochastic methods. This is currently limited to linear stream data.
- Utility exchangers now have a different pictogram and colour in the network editor to ease identification
- An issue with the network editor with mixing and splitting has been resolved
- An issue with block grid crashing has been resolved
- An issue with design constraints becoming corrupted has been resolved.

Version 2.0

- A match calculator tool has been added to explore and visualise temperature profiles
- Simulation and optimisation can now be performed with the network editor
- Exchanger temperature profiles can now be displayed on Driving force plots
- Exchanger defaults can now be globally applied to existing exchangers
- Exchanger can now have individual minimum approach temperatures.
- Utility stream profile can now be generated using the steam tables interface.
- Heat exchanger Ft/Xp sensitivity plot now correctly displaying.
- Network utility optimisation limits now specified in terms of enthalpy rather than specific heat capacity.

Version 1.8

- Exchanger template data now correctly applies unit's conversions.
- Block design grid now reports pinch temperatures correctly.
- A problem reading stream names has been corrected

Version 1.7

- The Network editor can now be entered without the pre-requirement for stream data
- A problem with the updating of stream colours has been corrected when streams were added/deleted
- Different network optimisation objective functions can now be selected.
- The stream data editor has been enhanced to improve the data transfer from the clipboard. If there is existing network data (exchanger, mixers etc.) the number and type of stream on the clipboard is checked before the paste operation to ensure compatibility.
- A problem with the network data corruption when deleting stream has been corrected.
- Additional text scaling function have been added to the network editor to help improve reports.

Version 1.6

- Economic data editor did not show operating hours if no cases loaded, this has been resolved
- Exchanger and temperature reports have been combined
- An option to draw utility exchanger using (H) or (C) symbols has been added
- the functional available for recording existing performance for retrofit calculations have been enhanced
- The minimum DT approach is highlighted in temperature reports

Version 1.5

- Retrofit: Improvements have been made to the Network Pinch Algorithm for heat exchanger network retrofit.
- Optimisation can now accommodate multiple operation conditions
- Heat exchanger can now be given names as identifiers.
- Heat exchanger can now be costed in terms of either the Duty or Area.
- Additional unit operation type has been added
- Utility streams can now be hidden in the network editor to simplify the diagram.
- The capital cost of utility infrastructure and now be include as a function of utility heat load.
- A Steam tables interface has been added.
- The network pinch options can now be displayed in the network editor
- Minor problem reading default cost law information has been fixed
- A Problem importing SDF file has been resolved

Version 1.4

- The network editor now shows scroll bars when "zoomed-in"
- Network containing a combination of Duty/Area specification for exchangers are now calculated correctly.
- The online help in the utility editor now works.
- The automated design option can now handle segmented stream data.
- Due to the increasing functionality of the program the main toolbar has been made user configurable.