

Bailey DCS Simulator - Release Notes

Item	E/B	Description
Changes Made at November 29, 2011 Release		
1	E	New HMI test functionality is added. This functionality is more precise than was previously provided, and supports: <ul style="list-style-type: none"> • definition of an MDB test input file • single step through test cases, tag by tag, with list of graphics on which that tag appears • exercise each tag though wide range of options at each test case, while observing graphic • Generate MDB test output file.
2	E	CIUCHANNEL line is modified at the default.INI file to support definition of CIU at given L:P:M address, without actually assigning a COM or SCSI port to it. The reason for this is so that simulator will support module status requests to that L:P:M address without actually using a USB Key license slot.
3	E	CONTROLLER line is modified at the default.INI file to support definition of controller at given L:P:M address, without actually assigning a CFG file to it. The reason for this is so that simulator will support module status requests to that L:P:M address without actually using a USB Key license slot.
4	E	PCU line is added to default.INI file. The reason for this is so that simulator will support module status requests to that L:P address. Some consoles will fault if a valid PCU status is not returned in response to status request. This change means that there is not a need to remove the PCU status request from these consoles.
5	E	Improved diagnostic messaging, to the event log, is provided for CIUCHANNEL, PCU & CONTROLLER lines within default.INI file, to assist in getting contents of default.INI correct.
6	E	Improved diagnostic messaging is provided if status request is received for non-existent L:P:M address within simulated DCS.
7	E	The CIU line, within the default.INI file is hereby considered obsolete for all serial RS-232 CIU emulation. All serial RS-232 CIU emulation should now be provided with the newer, and more functional, CIUCHANNEL line. Though the CIU line is removed from documentation, support for it may remain within the product function for some further releases.
8	E	Bailey DCS Simulator behavior in response to various TIME commands (set time and date, set time, set time stamp) received from HMI is improved. Internal simulator clock used to manage simulator operations is separated from "wall clock". Potential for a time offset between Simulator Wall Clock time and hosting computer Local time has been introduced (offset defaults to 0). Multiple time zones not supported.
9	B	Resolve issue which caused simulator client to crash.
10	B	Resolve minor issue at Points Table export (to CSV). Previously Points table showed incorrect CONNECTED status for Harmony block types (FC222, FC223, FC224, Fc225. This is corrected.,
11	B	Resolve minor issue at Points Table export (to CSV). Previously Points table showed incorrect MATCH status for Harmony block types (FC222, FC223, FC224, Fc225. This is corrected.,
12	B	Resolve issue at FC194 – User Defined data Export FC implementation. Corrected an error in Establish and Connect portion of communication protocol.
13	B	Resolve issue at Harmony IO blocks FC222, FC223, FC224, FC225. Previously, console communications did not work correctly. Now resolved.
14	E	Added support for 800xA PPA CIU communications.
15	E	Added support for OIS45 serial CIU communication. Previously this support was present, but there were problems responding to certain status requests from OIS45. These issues resolved.
16	B	Previously problems were reported with BaileySim client reading and writing specifications at block address > 10,000. Resolved. BaileySim now reads and writes specifications for all block addresses.
17	B	Previously the maximum address space for BRCx00 controller was 30,000 blocks. Maximum address should be 31, 998. Problem corrected, and tested with CFG files with addresses to 31,998.
Changes Made at August 29, 2011 Release		
1	B	Bug found and resolved, in response to CIU communications command READ ENHANCED BLOCK OUTPUT, frequently used by Composer. Command was occasionally misinterpreted, and results in failure to respond, and even log message REPLY_TIMEOUT_OF_LOOP_RESPONSE
Changes Made at August 19, 2011 Release		

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Item	E/B	Description
1	E	Add support for CIU communications to ABB PGP (Power Generation Portal) HMI console. Key changes required to add this support are included in this release.
2	E	Modify CIU communications to add Work Flag to all appropriate command responses when the Work Flag bit instruction is received at the RESTART command received from the HMI.
3	E	Add support within default.INI file to create instance within simulator of PCU (or CIU) without an associated CFG file. This is created via line (within default.INI) such as: CONTROLLER,INNP01,1,1,0 Modules added to simulator in this way are always reported with GOOD module status
4	E	If any HMI attempts to establish a point, when the same point (and same point type) is already established at that address then a positive response will be returned. This is because some consoles attempt to establish the same point multiple times.
5	E	Add support within CIU emulation to set RS-232 communications parity, via change to CIUCHANNEL line at default.INI, as follows: No parity CIUCHANNEL,INICT03:E0,13,3,COM1:19200 CIUCHANNEL,INICT03:E0,13,3,COM1:19200:N Odd Parity CIUCHANNEL,INICT03:E0,13,3,COM1:19200:O Even Parity CIUCHANNEL,INICT03:E0,13,3,COM1:19200:E
6	B	At CIU emulation, add exceptions for RMSC block type to response to ReadDataGroup command. Was previously omitted in error. ReadDataGroup command is not used by most consoles, but is used for PGP.
7	B	Several improvements have been made to CIU serial RS-232 communications. These changes were directed at improving CIU communications robustness in the face of various events.
8	B	Bug was found and fixed in establishing module status for modules of type CIU and PCU (modules at address LOOP:PCU:0 with no associated CFG file)
Changes Made at July 8, 2011 Release		
1	E	Support is confirmed for INICT12 CIU emulation, including valid CIU module status.
2		Bailey DCS Uses Manual is improved to clarify that Field S_S (of BaileyWrapTable within IO.MDB used by DCSIOManager) shall: <ul style="list-style-type: none"> • be of data type INTEGER (FLOAT is supported also, but Previs recommends use INTEGER) • contain INTEGER spec number in domain (NULL, 0, 1, 2, ... N) • S_S field value of NULL or 0 will generate DIRECT READ at block address givem • S_S field value of <valid spec number in format INTEGER> will generate INDIRECT READ at upstream address connected to the specification.
3	B	Issue corrected at DCSIOManager which prevented correct INDIRECT READ from some field output block types. Previously <i>Read LPMB:S<base + N></i> all returned the same output value as <i>Read LPMB:S<base></i>
4	B	Incorrect FC behavior at Harmony digital Channel IO blocks (FC224 and FC225) has been corrected. Previously, blocks generated inverted alarm sense with respect to Alarm State specification (FC224 S2 and FC225 S3)

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Item	E/B	Description
5	B	<p>Problem has been reported whereby Bailey DCS Simulator will occasionally crash and exit memory at time of High Composer usage (monitoring, tuning and changing CLD's with monitor running). To address this, improvements have been made to serial driver robustness, and changes have been made to error reporting, including event log errors, with respect to specific communication protocol commands expected from Composer. If further issues of this nature are encountered, user is requested to provide (FTP arrangements will be made):</p> <ul style="list-style-type: none"> - Application event log - set of CFG files and default.INI file in use - DCS state file captured IMMEDIATELY prior to transfer from MAN to AUTO - Composer project with all CLD - Identification of CLD monitor and change actions that were being performed at Composer at time of fault event (including CLD name) <p>If possible, try to repeat the fault, to see if it occurs again with same Composer actions.</p>
6	B	<p>Problem has been reported with behavior of FC156 Advanced PID. Problem occurs when FC156 specification S20=1, and manifests as significant control bump, and possible loss of control, on transfer from MAN to AUTO. Previs has made FC156 changes intended to resolve this issue. There is some question remaining if behavior will be correct. If any user encounters an issue with FC156, at transfer from MAN to AUTO, please provide:</p> <ul style="list-style-type: none"> - L:P:M:B address of misbehaving FC156 - set of CFG files and default.INI file in use - DCS state file captured IMMEDIATELY prior to transfer from MAN to AUTO.
Changes Made at June 26, 2011 Release		
1	E	COMMENT field added to BaileySim FORCE tab, so that a mnemonic name can be given to forced values.
2	E	Support has been added for the BATCH-90 PROGRAM DESCRIPTOR function.
3	B	Resolved issue at function code FC45 – Digital Exception Report. Previously, when specification S2=2 AND FC45 block value was over-riden via the BaileySim client FORCE function the block would generate an alarm. This problem is resolved, and the block no longer generates an alarm under these circumstances.
4	B	Resolved issue at function code FC34 - Memory . Previously the block would provide an erroneous INITIAL CONDITION under specific input specifications settings. This problem is resolved.
5	B	Resolved issue at function code FC148 – Batch Sequence (BSEQ). Previously FC148 block output N+3 did not get set to 1 when fault logic is active. This problem is resolved and FC148 output N+3 now sets to 1 when fault logic is active.
Changes Made at April 5, 2011 Release		
1	B	Change FC104 output N to REAL instead of INTEGER.
Changes Made at April 2, 2011 Release		
1	B	Resolve issue at BaileyWrapTable write to FC104.
Changes Made at March 31, 2011 Release		
1	E	<p>Changes made to previous implementation of Harmony Channel IO function codes:</p> <ul style="list-style-type: none"> • FC222 - Analog In/Channel • FC223 - Analog Out/Channel • FC224 - Digital In/Channel • FC225 - Digital Out/Channel <p>Previously, a block frame was present to support each of these FC. Revision has been made to add further console support for each of these blocks including:</p> <ul style="list-style-type: none"> • Specification and process exceptions and alarms • Tuning from Composer

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Item	E/B	Description		
5	B	Resolve problem at FC129 Multistate Device Driver in which FC69 – TSTALM failed to show correct alarm state for MSDD block when in override mode.		
Changes Made at January 12, 2011 Release				
1	B	Resolve issue at FC19 – PID which prevented bumpless transfer from STATION manual to auto mode. Problem manifested as discontinuous CO output at STATION mode change. No other change made at this release.		
Changes made at November 19, 2010 Release				
1	B	Resolve minor CIU communication protocol issue with respect to analog and digital report block types.		
Changes made at November 9, 2010 Release				
1	B	Resolve software bug that prevented correct restore of block specifications via the API Restore DCS State function. This function is documented in the <i>Technical Manual - Bailey DCS Simulator API</i> and requires that a “/spec” string be appended to the file name at restore via the API. This function will overwrite specification changes made since the time the DCS state file was saved.		
Changes made at October 21, 2010 Release				
1	B	Eliminate potential cause of buffer overrun in serial COM port communications. This change is made to improve robustness of serial port communications.		
2	E	Improve error messages related to serial port communication issues.		
Changes made at September 29, 2010 Release				
1	B	Resolve issue in Bailey DCS Simulator in which exception report for RCM tag type occasionally is responded with 5 bytes instead of 2 bytes. This may manifest at console as bad quality for some tags, but no necessarily the RCM tag type. It is also possible that this problem (Bad Q tags) MAY or MAY NOT clear after a time.		
Changes made at June 28, 2010 Release				
1	E	Substantial enhancement to IOAddressExport function at BaileySim Client Debug Tab. This function scans all CFG files that are loaded, and exports an CSV file with one record per expected Field Input or Field Output. This function works by scanning for block types that perform IO functions. Function has been expanded to increase the number of IO block types support. The total list of supported block types for the IOAddressExport function is now as follows:		
		<table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top; width: 50%;"> <ul style="list-style-type: none"> ● FC27 - Analog Input ● FC28 - Analog Output (Same PCU Node) ● FC29 - Analog Output ● FC43 - TCS Digital Input ● FC44 - TCS Digital Output ● FC49 - Digital Output Buffer ● FC55 - Hydraulic Servo ● FC70 - Analog Point Definition ● FC79 - Control Interface Slave ● FC83 - Digital Output Group ● FC84 - Digital Input Group ● FC93 - BASIC Real Output ● FC94 - BASIC Boolean Output ● FC102 - Pulse Input/Period ● FC103 - Pulse Input/Frequency ● FC104 - Pulse Input/Totalization ● FC107 - Group I/O Definition (IMLMM02) </td> <td style="vertical-align: top; width: 50%;"> <ul style="list-style-type: none"> ● FC109 - Pulse Input/Duration ● FC114 - BCD Input ● FC115 - BCD Output ● FC132 - Analog Input/Slave ● FC137 - C and BASIC Program Real Output With Quality ● FC138 - C or BASIC Program Boolean Output With Quality ● FC145 - Frequency Counter/Slave ● FC149 - Analog Output/Slave ● FC150 - Hydraulic Servo Slave ● FC158 - Enhanced Analog Point Definition ● FC215 - Enhanced Analog Slave Definition ● FC216 - Enhanced Analog Input Definition ● FC222 - Analog In/Channel ● FC223 - Analog Out/Channel ● FC224 - Digital In/Channel ● FC225 - Digital Out/Channel ● FC229 - Pulse In/Channel </td> </tr> </table>	<ul style="list-style-type: none"> ● FC27 - Analog Input ● FC28 - Analog Output (Same PCU Node) ● FC29 - Analog Output ● FC43 - TCS Digital Input ● FC44 - TCS Digital Output ● FC49 - Digital Output Buffer ● FC55 - Hydraulic Servo ● FC70 - Analog Point Definition ● FC79 - Control Interface Slave ● FC83 - Digital Output Group ● FC84 - Digital Input Group ● FC93 - BASIC Real Output ● FC94 - BASIC Boolean Output ● FC102 - Pulse Input/Period ● FC103 - Pulse Input/Frequency ● FC104 - Pulse Input/Totalization ● FC107 - Group I/O Definition (IMLMM02) 	<ul style="list-style-type: none"> ● FC109 - Pulse Input/Duration ● FC114 - BCD Input ● FC115 - BCD Output ● FC132 - Analog Input/Slave ● FC137 - C and BASIC Program Real Output With Quality ● FC138 - C or BASIC Program Boolean Output With Quality ● FC145 - Frequency Counter/Slave ● FC149 - Analog Output/Slave ● FC150 - Hydraulic Servo Slave ● FC158 - Enhanced Analog Point Definition ● FC215 - Enhanced Analog Slave Definition ● FC216 - Enhanced Analog Input Definition ● FC222 - Analog In/Channel ● FC223 - Analog Out/Channel ● FC224 - Digital In/Channel ● FC225 - Digital Out/Channel ● FC229 - Pulse In/Channel
<ul style="list-style-type: none"> ● FC27 - Analog Input ● FC28 - Analog Output (Same PCU Node) ● FC29 - Analog Output ● FC43 - TCS Digital Input ● FC44 - TCS Digital Output ● FC49 - Digital Output Buffer ● FC55 - Hydraulic Servo ● FC70 - Analog Point Definition ● FC79 - Control Interface Slave ● FC83 - Digital Output Group ● FC84 - Digital Input Group ● FC93 - BASIC Real Output ● FC94 - BASIC Boolean Output ● FC102 - Pulse Input/Period ● FC103 - Pulse Input/Frequency ● FC104 - Pulse Input/Totalization ● FC107 - Group I/O Definition (IMLMM02) 	<ul style="list-style-type: none"> ● FC109 - Pulse Input/Duration ● FC114 - BCD Input ● FC115 - BCD Output ● FC132 - Analog Input/Slave ● FC137 - C and BASIC Program Real Output With Quality ● FC138 - C or BASIC Program Boolean Output With Quality ● FC145 - Frequency Counter/Slave ● FC149 - Analog Output/Slave ● FC150 - Hydraulic Servo Slave ● FC158 - Enhanced Analog Point Definition ● FC215 - Enhanced Analog Slave Definition ● FC216 - Enhanced Analog Input Definition ● FC222 - Analog In/Channel ● FC223 - Analog Out/Channel ● FC224 - Digital In/Channel ● FC225 - Digital Out/Channel ● FC229 - Pulse In/Channel 			
Changes made at April 16, 2010 Release				
1	B	Resolve problem that caused Bailey DCS Simulator to crash (Dr. Watson) at load of SOME but NOT ALL CFG files from versions of ABB Composer earlier than 5.0. Issue relates to Function Block specifications in the form of ASCII strings. Problem is resolved and crash will no longer occur. This problem was introduced at 26 march 2010 release, and will not affect earlier releases.		
Changes made at March 26, 2010 Release				

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Item	E/B	Description
1	E	Some customers have reported issues with Composer EWS communications to the simulator. As part of a strategy to reduce such issues, support is added for a new default.INI command named CIUCHANNEL. This command permits a more flexible definition of emulated CIU parameters, such that any CIU can be defined as INICT03 or INICT01 (as well as other types which may not be documented to end users). In response to a request, from EWS or console, for the emulated CIU to identify what CIU TYPE it is (as well as other parameters), this command permits the emulated CIU to auto-announce itself as any selected CIU type.
2	E	Communication with ABB Composer, version 5.0.3 tested and confirmed. The following specific functions have been tested with Composer 5.0.3 for module types MFC, MFP, BRC, LMM, COM and AMM: <ul style="list-style-type: none"> - switch to CONFIG mode - switch to EXECUTE mode - initialize controller to delete all function codes - Load configuration to a controller directly from Composer via the CIU - Monitor CAD sheet - Tune function codes - Display controller status report from a emulated controller - Use the Composer VERIFY function to verify (i.e. compare) the controller configuration with the CLD files (Control Logic Documents) for this controller (currently tested only for MFC, MFP, BRC) - Save configuration from an emulated controller to a CFG file (tested with Composer 5.0.3 only for MFC, MFP, BRC) - Composer VERIFY and SAVE currently works only for MFC, MFP, BRC module type.
3	E	The CONFIG mode of controller behavior has been modified for controller types MFC, MFP, BRC, LMM, COM and AMM. Before, when the controller was in CONFIG mode, function codes did not execute, outputs switched to Bad quality, and exception processing was suspended. Now, all function codes are disconnected from all CIU and from other function codes so that the controller can be initialized (i.e. all function codes deleted) and a new configuration can be loaded from the EWS via emulated CIU.
4	E	A new data type "String" (E90STRING) has been implemented to improve support for tuning function codes that uses the "String" data type and to improve the LOAD and SAVE CFG files operations for Function Codes that use "String" data type for specifications.
5	E	Numerous (50+) changes have been to function code specifications at various Function Codes, to improve LOAD, READ, TUNE and VERIFY operations from the Composer EWS.
6	E	Serial communication speed for emulated CIU has been improved, such that response time now depends primarily on the selected COM Port baud rate for the emulated CIU.
7	E	An empty frame, without internal FC implementation, has been added for each of the following Function Code Types: 32, 57, 98, 100, 102, 114, 115, 116, 134, 141, 142, 144, 148, 150, 152, 153, 154, 155, 169, 170, 184, 185, 186, 187, 188, 190, 191, 192, 193, 194, 198, 199, 210, 211, 212. Previously, without this frame, it may not have been possible to execute a CFG file that contained one of these unsupported blocks (and an error message was logged to say so). Now, with these frames implemented, these blocks (though not implemented internally) will not impede execution of the CFG file. An "Under Construction" error message is issued when Function Codes of the type noted here are encountered..
8	Issue	KNOWN ISSUE – The old (i.e. Net 90 vintage) LMM, COM and AMM controller types do not provide an FC89 (Last Block) function code or equivalent. As a result, certain Composer operations (e.g. READ and VERIFY), that require a LAST BLOCK marker do not work, because Composer can not determine the last block address. Additional communications protocol support (i.e. Module Information Command) is required to support certain EWS operations. This limitation is known to impact LMM, COM and AMM controller types.

Changes made at December 11, 2009 Release

1	B	Resolved problem in FC3 - Lead/Lag that caused bump at transfer. Transfer is now bump less.
2	B	Resolved issues at FC18 - PID Error Input that prevented bump less transfer. Transfer is now bump less.
3	B	Resolved issues at FC103 - Pulse Input/Frequency and FC104 - Pulse Input/Totalization which did not interact correctly with field IO read/write via API.
4	B	Resolved potential floating point arithmetic error at FC7 - Square Root, FC156 - Advanced PID Controller, FC171 – Trigonometric, and other blocks which may cause issues in specific arithmetic situations.

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Item	E/B	Description
5	B	Previously, the response to POINT_MODSTAT_READ and POINT_RCM_READ were incorrectly reported in response to READ EXCEPTIONS. This has been corrected so that these responses are correctly reported in response to READ MISCELLANEOUS STATUS EXCEPTIONS . This will only affect a limited number of console types that use very old Bailey DCS protocols.
Changes made at September 29, 2009 Release		
1	E	Add support for the following additional function codes. Limitations, in any, are described in the Users Manual Appendix A: <ul style="list-style-type: none"> • FC109 - Pulse Input/Duration • FC221 - I/O Device Definition • FC226 - Test Status • FC247 - Condition Monitoring
2	E	The Bailey DCS Simulator (via external application DCSOPCManager) can now act as an OPC Data Access v2.0 Server, providing OPC DA read/write access to any address within the simulated DCS. At present this function is at beta release. Contact Previsé if you need to use this
3	B	Resolve problem in reading specification format for FC226 - Test Status. This problem was observable as “invalid Spec format” message at event log.
Changes made at July 11, 2009 Release		
1	E	Documentation improvements made throughout.
2	B	Resolved problem in chained block implementation for FC161 - Sequence Generator.
Changes made at October 15, 2008 Release		
1	E	Add support for the following additional function codes. Limitations, in any, are described in the Users Manual Appendix A: <ul style="list-style-type: none"> • FC5 - Pulse Rate • FC20 - Indicator Station • FC21 - M/A Station (Basic) • FC22 - M/A Station (Cascade) • FC23 - M/A Station (Ratio) • FC27 - Analog Input • FC29 - Analog Output • FC43 - TCS Digital Input • FC44 - TCS Digital Output • FC53 - Executive Block (COM) • FC71 - Executive Block NAMM02/IMAMM03 • FC72 - Analog Slave Definition • FC73 - Calibration • FC77 - Analog Point Service Status • FC78 - Trend Definition • FC87 - DLS Interface • FC88 - Digital Logic Station • FC99 - Sequence of Events Log • FC105 - Executive Block (IMLMM02) • FC106 - Segment Control Block • FC107 - Group I/O Definition (IMLMM02) • FC108 - Extended Executive (IMLMM02) • FC158 - Enhanced Analog Point Definition • FC159 - Polynomial Adjustment • FC222 - Analog In/Channel • FC223 - Analog Out/Channel • FC224 - Digital In/Channel • FC225 - Digital Out/Channel • FC227 - Gateway (Harmony) • FC228 - Foreign Device Definition
2	E	Modify the USB license key to increase the maximum number of controller modules supported from 100 to 500. This doesn't change the maximum number of blocks that can be supported, as this is constrained by system resources. Currently the largest system in-service is 170,000 blocks.
Changes made at May 23, 2008 Release		

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Item	E/B	Description
1	E	The MOD line in the default.INI file is now obsolete and is replaced with a new CONTROLLER line. The MOD line will continue to be accepted at this version, but will be removed at a later version. This change is made in preparation for support of specific aspects of various controllers. Previously all controllers were treated as being the same. Going forward certain differences between controller types will be supported.
2	E	Supported is added for BRC x00 controller modules. These controllers, the BRC100/200/300/400, have block address space to 30,000 instead of previous limit of 10,000. Module status returns to connected console/EWS devices for BRC controller modules are confirmed.
3	E	The Bailey DCS Simulator (via external application DCSIOManager) can now act as an OPC Data Access v2.0 Client, providing read/write capability to any compatible OPC Data Access Server. Refer to Users Manual Appendix K for further information and configuration instructions.
4	E	An external application (DCSIOManager) is added to support "IO Wrap Around", such that any analog or digital value can be read from an arbitrary LIPIMIB block address and written back to another arbitrary LIPIMIB block address. This supports the addition of process simulation within Bailey block logic (i.e. CAD files compiled to CFG files), without the need to modify the control logic CAD sheets to connect process simulation IO to control logic IO. The control logic can be used "as-is", without the IO mapping previously required.
5	E	Support, previously present but not used, for multiple controller segments, is now confirmed.
6	E	Support is added for connection by ABB Composer version 5.0
7	E	The following support is now available for any organization that wishes to develop an application, or write software, that connects to the Bailey DCS Simulator: <ul style="list-style-type: none"> • The API is described in <i>Technical Manual – Bailey DCS Simulator API</i> • A sample application, with source code available in Microsoft Visual C++, to connect to the API is available to simplify the task of writing software to this API. • A simple "<i>Hello World</i>" application is available, to execute inside the simulator, to provide a simple yet fully functional application to help test API read/write functions. • Previs can provide web base training, nominally ½ day in duration, and additional web based assistance as required.
8	E	Previs has developed a standard semi-automated process to prepare a complete and reliable IO List at the field IO Interface. This IO List is keyed on Instrument number and is needed to connect an external process simulator to the simulated DCS logic. Ask about this if you need an IO List or need to connect an external process simulator.
9	B	Resolve issue which caused high exception rate to console when alarms disabled in BaileySim Alarms tab.
10	B	Several issues have been resolved in the IO Address Export function, including: <ul style="list-style-type: none"> • Previously no records were included for FC149 blocks (Analog Output Slave). FC149 records are now included in the IO address Export Function for this FC. • Previously, records relating to output blocks were marked as USED even though the related Specification was connected to an output of the Executive block with a default fixed value. These records are now marked as SPARE outputs.
11	B	Previously, simulator responded to commands READ BLOCK OUTPUT and READ ENHANCED BLOCK OUTPUT with the same response bytes, providing all analog values in Bailey REAL3 format (3 bytes). This caused problems with Composer v5.0 when connected to emulated BRCx00 controller module, where Composer expected analogs in REAL4 format (i.e. 4 bytes instead of 3). Emulated CIU response for analog signals has been changed so for the READ BLOCK OUTPUT command the response is in REAL3 format and for the READ ENHANCED BLOCK OUTPUT command the response is in REAL4 format.
12	B	Block tuning functions have been modified to provide REAL3 and REAL4 responses in a manner which matches standard Bailey function.
13	B	Resolve issue which occurred at install and uninstall of Bailey DCS Simulator. Previously system would generate a Dr. Watson error message and crash at exit.
Changes made at January 29, 2008 Release		
1	E	Support added for Function Code FC133 – Smart Field Device Definition
2	E	Support added for serial communication baud rates above 19.2 Kbaud. Previously supported only the same baud rates as typically supported by actual ABB serial CIU hardware (i.e. to 19.2 Kbaud). Now all baud rates that are supported by the simulator PC hardware platform are supported. Tested to 230.4 Kbaud.

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Item	E/B	Description
3	E	Support added for console connection by Emerson DeltaV Connect, for DeltaV consoles.
4	E	Support added for connection by Rovisys OPC server.
5	E	Support added for EVENT line at default.INI file. The EVENT line supports definition of event log verbosity, by suppressing some messages when no longer required for troubleshooting.

Changes made at December 21, 2007 Release

1	E	<p>Several features are added to support management of alarms within selected operator consoles, when connected to the Bailey DCS Simulator. These features include:</p> <ol style="list-style-type: none"> To mitigate initial flood of alarms at startup, all alarms can be disabled at simulator startup, and enabled at a later time. Alarm ACK is shared from console to console so that alarm does not need to be acknowledged more than once (currently supported for selected consoles on SuperLoop only). A global alarm ACK function supports acknowledgement of all alarms on all consoles on a manual or automated basis. <p>To learn more about these features you will need to review:</p> <ol style="list-style-type: none"> ALARMS line of default.INI file (Refer to Users Manual) Alarm Enable/Disable function at API (Refer to Technical Manual - Bailey DCS Simulator API). Global alarm ACK function (See Users Manual and Technical Manual - Bailey DCS Simulator API).
2	E	Add support for Function Code FC157 – General Digital Controller.
3	E	To support alarm ACK functions, limited support for the following Super Loop commands has been added: - OUTPUT GROUP MESSAGE - READ PLANT MESSAGE
4	E	A function is added at the BaileySim Client to log trend data provided to a console to assist with troubleshooting trend related issues if they occur. This function is for Previser use only, and is in keeping with our philosophy to provide test instrumentation directly within the Bailey DCS Simulator to support remote troubleshooting.
5	B	FC82 – Segment control function related to spec S02 (Target period) has been modified. This has been set to the minimum allowed target period by Default.ini file. Not doing this causes some blocks (for example FC8) not work properly when Spec S02 is set to 0 within the module.
6	B	A minor defect has been repaired in Function Code FC161 – Sequence Generator
7	B	FC66 – Analog Trend and FC179 – Enhanced Trend have both been modified to change the way process state is restored at DCS state file restore. Previously the restoration of a state file occasionally caused loss of console on-screen trend data
8	B	Modifications have been made to improve the robustness of SCSI data communications within the emulated INICT03 CIU. Previously some failures were observed specifically on channel SCSI1, while channel SCSI0 seemed fine. The SCSI1 channel robustness has been improved.

Changes made at August 9, 2007 Release (This is an extensive revision)

CIU Communications

1	E	<p>Add support for emulated INICT03-SCSI interface. The Bailey DCS Simulator will now support:</p> <ul style="list-style-type: none"> A Total of 8 simulated CIU channels at any given time. 0, 1 or 2 (but no more than 2) of these can be via emulated INICT03 SCSI communications The remainder can be any combination of INICT03 or CIU04 emulation via either serial or TELNET TCP/IP communications.
2	E	Add support for communications with ABB Composer ^{IT} Engineering Workstation tools. This support includes serial and SCSI communications (emulated INICT03) the ability to load/unload controller modules, to tune blocks within controller modules, to perform module mode control while the simulated DCS is on line, and the ability to monitor CAD sheets on-line.
3	E	Add support within the Bailey DCS Simulator for communications with the Wonderware InTouch HMI through the Wonderware stack server (driver) for Bailey DCS systems.
4	E	Add support for connection via Rovisys OPC Server for Bailey DCS.
5	E	Add Support for communications with the CiTech HMI through the CiTech driver Bailey DCS.

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Item	E/B	Description
6	E	Add support for communications, via the SCSI protocol, to ABB OIS4x consoles. Currently the Bailey DCS Simulator can support simultaneous connection to two OIS4x master consoles. Contact Previsé for hardware details about how this connection is made.
7	E	Additional capability is embedded within the Bailey DCS Simulator to support remote CIU communications troubleshooting from Previsé.
8	E	Add support within BaileySimClient to export the CIU Points table as received from a console connected to the emulated CIU. This is added to assist in locating console tags that are either (a) addressed to non-existent blocks within the controller CFG files or (b) of a data type that doesn't match the data type for the addressed function block.
9	E	Support is added to support and respond to Establish Reports CIU communications protocols required for Conductor NT SCSI communications, as well as several additional protocols required for CiTech communications.
10	E	Substantial enhancement has been made to CIU protocol support, in anticipation of possible protocol requirements for several operator console products that have not currently been tested against the Bailey DCS Simulator. These protocol improvements include: <ul style="list-style-type: none"> ▪ Support for Read Value – List and Read Value – Group ▪ Support for Read Status – List and Read Status - Group ▪ Support for Read Miscellaneous List and Read Miscellaneous - Group ▪ Support for Read Station – List and Read Station – List ▪ Support for Read Data – List and Read Data – Group ▪ Support for Establish Report and related messages ▪ Improved error handling ▪ Improved responses to unexpected console commands ▪ Time synchronization
11	E	Add support for Time Synchronization between Bailey DCS Simulator and connected console equipment. This function is configured via a new line in the <i>default.INI</i> file.
12	E	Add support to time stamp exceptions prior to sending to console. This feature is (optionally) requested by the operators console.
13	E	Add background exception screening mode to support management of exception traffic related to background exceptions. See BESC line in default.INI.

Function Code Support

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Item	E/B	Description
14	E	<p>Add support for the following additional Bailey DCS Function Codes:</p> <ul style="list-style-type: none"> ▪ FC 55 - Hydraulic Servo ▪ FC 66 - Analog Trend ▪ FC 91 - BASIC Configuration (MFC/MFP) ▪ FC 92 - Invoke BASIC ▪ FC 93 - BASIC Output Buffer – Real ▪ FC 94 - BASIC Output Buffer – Boolean ▪ FC 117 - Boolean Recipe Table ▪ FC 118 - Real Recipe Table ▪ FC 124 - Sequence Monitor ▪ FC 128 - Slave Default Definition ▪ FC 137 - BASIC Real Output Buffer with Quality ▪ FC 138 - BASIC Boolean Output Buffer with Quality ▪ FC 139 - Passive Station Interface ▪ FC 143 - Invoke C ▪ FC 145 - Frequency Counter/Slave ▪ FC 146 - Remote I/O Interface ▪ FC 147 - Remote I/O Definition ▪ FC 161 - Sequence Generator ▪ FC 178 - Data Acquisition Analog Input/Loop ▪ FC 179 - Enhanced Trend Definition ▪ FC 215 - Enhanced Analog Slave Definition ▪ FC 216 - Enhanced Analog Input Definition ▪ FC 217 - Enhanced Calibration Command ▪ FC 226 - Test Status Block Outputs ▪ FC 241 - Distributed SOE SEM-MFP Interface ▪ FC 242 - Distributed SOE Digital Event Interface ▪ FC 243 - Executive Block (INSEM01) ▪ FC 244 - Addressing Interface Definition ▪ FC 245 - Input Channel Interface <p>For all Function Codes, refer to the appendices in the Users Manual, Bailey DCS Simulator for implementation notes for each Function Code. Contact Previsé if you require more detailed Function Code information.</p>
15	E	Improvements have been made to the manner in which most FC82 – Segment Control specifications have been implemented. This affects exception timing, PID behavior, dead bands and sequencing throughout. Support is added for optimal sequencing as selected by spec S15 of FC82.
16	B	Resolve problem in FC129 – MSDD which prevented operator console control under specific override condition. Behavior modified to match native MFC/MFP behavior.
17	B	Resolve problem in FC4 – Pulse Positioner which gave incorrect output value when Specification S6 (Cycle Time) is set to 0. Behavior modified to match native MFC/MFP behavior.
18	B	Repair several minor bugs in STATION (FC80) block
<i>CFG file Management</i>		
19	E	<p>Previously, at May 8, 2006 release, support was added to (optionally) save CFG files at exit from Bailey DCS simulator, and support was added within default.INI file to define whether CFG files would be saved at exit or not. CFG file save function is changed as follows:</p> <ul style="list-style-type: none"> ▪ If default.INI switch enables the function, CFG files are saved when they are changed rather than at exit. ▪ Additional CFGFileSave function is defined at API to permit external control of this function <p>CFG files can now be saved:</p> <ul style="list-style-type: none"> ▪ Under host computer control via the API ▪ Under manual control via the BaileySim Client ▪ Automatically at any control program change (including tuning) if auto-save selected at <i>Default.INI</i>
20	B	Repair problem in opening Composer format CFG files.
<i>IC Save and Restore (DCS State Files)</i>		

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Item	E/B	Description
21	E	Add support to define arbitrary file path for DCS process state files (IC files). The path for these files is now defined within the <i>default.INI</i> file.
22	E	Change made to issue exceptions to console immediately at IC (DCS state file) restore, before entering EXECUTE state, rather than waiting until mode change from PAUSE to EXECUTE is made. This is intended to help stabilize the console graphics as soon as possible in an operator training simulator.
23	E	Changes have been made to improve the manner in which IC (DCS state file) is restored, particularly when there has been an intervening controller logic file (CFG file) change since the DCS file was saved.
<i>BaileySim Client</i>		
24	E	Add Force Tab to BaileySimClient. This function allows the user to <i>force</i> any block address within the DCS to a desired value.
25	E/B	Several usability improvements and bug fixes have been made to the BaileySimClient.
<i>Other Changes</i>		
26	E	Add support for a high performance API specifically intended for field IO communication with external process simulation. This API is documented in the Technical Manual - Bailey DCS Simulator API also located on this CD-ROM.
27	E	Add support to generate a list of IO points required for API directly from CFG files. This can be used to seed the process to generate the final IO list, or to cross verify the IO list used for external process simulation.
28	E	Extend execution speed throttle domain from (1 X <> 10 X real time) to (0.1 X <> 10 X real time)
29	E	Add support for the following two additional license switches on the USB License Key: <ul style="list-style-type: none"> ▪ Enable or Disable API ▪ Enable or Disable SCSI CIU emulation Please note that the "old USB Key" (for versions prior to this version) will not work and will need to be replaced with a "new USB key". If you are a licensed user there will be no charge for this key upgrade. Please contact Previs to arrange for a USB key exchange.
30	E	PerfCPU and PerfSlip performance monitoring tools added to Watch tab to support observations of average CPU load by simulator and average simulator slip WRT real time.
31	E	Improvement performance instrumentation via further implementation of outputs from FC82 Segment control block. Contact Previs if you require further details.
32	B/E	Numerous robustness and performance improvements throughout the Bailey DCS Simulator.
Changes Made at May 22, 2006 Release		
1	E	Add Test Tab function to support HMI testing and commissioning. Add Sample Test Files to CD-ROM.
Changes Made at May 8, 2006 Release		
1	E	Support for connection of ComposerIT to emulated CIU interface added.
2	E	Support, within the emulated CIU interface, has been added for several sub-commands within the <i>Output general message</i> series of commands. The sub-commands that have been implemented are <i>Read Block</i> , <i>Read Next Block</i> , <i>Write Block</i> , <i>Tune Block</i> . The impacts of this change are that: <ul style="list-style-type: none"> ▪ Block tuning may now be performed from Conductor NT consoles ▪ This is part of the change to support ComposerIT as above.
3	E	Support added for optional save CFG file upon simulator EXIT. Previously, if the CFG file was changed during simulator execution, the changes would be lost at simulator exit. Now the simulator can be configured so that all CFG file are saved automatically at simulator exit.
4	E	Supported added for optional <i>Paused Mode</i> , such that simulator operation may be paused at startup, immediately after CFG file load, but before CFG execution.
5	E	Support added for a new OPTION switch (line OPTION,X,X,X,X,X) within the <i>default.ini</i> file.
6	E	Supported added so that EWS software may now execute an Initialize Module command when connected to the CIU interface. This supports load of new CFG file from EWS software.
7	B	Previous version exhibited possible software crash at deletion of blocks via EWS software via emulated CIU interface. Problem resolved.
8	C	BaileySimClient Debug Messages window now displays event messages taken from Windows Event Log instead of from an internal log file within Bailey DCS Simulator as before. This improves the length of log file.

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Item	E/B	Description
9	C	<i>Spec_defaults.txt</i> file is no longer part of the installation and is no longer used. The contents of this file have been compiled directly into BaileyDCSSimulator.exe.
Changes Made at March 22, 2006 Release		
1	B	Resolve problem affecting implementation and execution of FC171 – Trigonometric block. Problem manifested as errors in CIU communications (incorrect communications data) for FC171 (as observed at Previs OPC server connected to simulator) and as invalid and incorrect block <i>Specifications</i> for this block type.
2	B	Resolve problem which affects ONLY TELNET communications to Previs OPC Server and console products. This problem manifested as multiple apparent CIU in BaileySimClient CIU list, even though only one TELNET CIU actually connected. Problem caused by failure to drop TELNET connection when OPC server disconnects, which results in instantiation of additional TELNET CIU channel at next OPC server connection. This caused user problems when number of apparent CIU connections exceeds licensed CIU connections.
3	E	In preparation for substantial improvements to DCOM API functions to be provided at an upcoming release, Bailey DCS Simulator code has been restructured in order to reduce the number of threads, to provide standard access to all data, to add versioning to the state (DCS) file and improve standardization in interface to all Function Blocks within simulator. This change should not affect any user observable functionality and is not in response to any reported problem.
4	B	Resolved several minor bugs located in DCOM interface (e.g. API) to Bailey DCS Simulator. These were identified in the lab and have not been reported by any site.
Changes Made at November 28, 2005 Release		
1	E	Support added for the module (module address 0) within each PCU. If PCU module (i.e. module at module address 0) is configured into the device connected to the CIU, the Bailey DCS Simulator correctly reports a module status for this address, with module type set to INVALID. In the connecting console or driver has a module at module address 0 within any PCU, the Bailey DCS Simulator will now correctly establish the point table entry for the module and report module status with INVALID module type. NOTE that no module mode operations are supported for module address 0 (i.e. not possible to switch module from EXECUTE to CONFIGURE mode, as this is not a controller module) and that attempts to do so with a non-controller module at address 0 are not advised. To properly configure a PCU into the simulated DCS, the user will now have to make specific configuration for each PCU within the default.INI file. To configure a PCU into the DCS configuration at the <i>default.INI</i> file, one instance of the PCU record must be added for each PCU. For details refer to the Users Manual.
2	E	To support addition of future features, this release adds support for a <i>Module Type Table</i> so that (a) the default.INI file may be used to specify specific module types at specific addresses and (b) so that module level responses may be tailored for specific module types. At present release, Bailey DCS Simulator only tailors the module response for CIU modules and for PCU base address modules.
3	E	Previous version of Bailey DCS Simulator did not respond to host computer (i.e. console) requests for CIU module status. Change is added so that a response is sent to CIU module status requests. The response is a standard “everything is OK” response, but includes the CIU module type for use by the host computer.
Changes at October 5, 2005 Release		
1	E	Add notification of time limited license expiry at SimClient Debug Message tab and at Event Log. This applies only to licenses that have been purchased for a specific time period.
Changes at August 26, 2005 Release		
1	E	Add <i>Loop Back Mode</i> to support testing of operator console systems. Refer to Users Manual for details.
2	E	Add <i>CFGAutocreate.exe</i> utility to automatically create a usable set of Bailey DCS controller files (file type CFG) from the tag database CSV file that is used by the Previs Bailey DCS OPC Server.
3	E	Add the ability to enable and disable alarms by tag type to assist in test of HMI alarm behavior. Refer to Alarms tab of BaileySimClient. This function permits test of each individual supported alarm type.