ROVISYS

Independent Automation Solutions

OPC90 Server

For Bailey

Command Series / NETWORK 90® / INFI 90®

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1 Introduction

The RoviSys Company has developed a tightly integrated interface between OPC clients and a Bailey DCS that promotes future plant upgrades using OPC. This interface is called the OPC90 Server. It allows easy and extremely user intuitive replacement of Bailey operator consoles with Windows NT/2000/XP/2003_Server based OPC Client consoles. It also provides an open migration path from the Bailey control platform to OPC as plant time, resources and schedule permits.

The OPC90 Server enables seamless DCS access to the Bailey Controls Command Series, NETWORK 90 and INFI 90 Distributed Control Systems. The server can communicate at the network level via the appropriate Computer Interface Unit (NCIU0X), Plant Loop to Computer Interface (INPCI0X), Infi-net to Computer Interface (INICI01, INICI03, INICI12, INICI13, IIMCP01/02) or, within a single Process Control Unit, via a Computer Interface Command (CIC01), Serial Port Module (NSPM01, IMSPM01) and Computer Port Module (CPM02/03). The bottom line is OPC90 can communicate with all interfaces available for NETWORK 90 / INFI 90 and Command Series Distributed Control Systems. System integrity, functionality, and data throughput is maintained by utilizing standard exception reporting techniques. Bandwidth improvements are realized over existing Bailey use of these same hardware interfaces by implementing dual channel capability and redundant interfaces.

This document is intended for individuals who are familiar with the Bailey configuration principals in terms of the types and how to access exception report blocks. An understanding OPC is also required.

OPC90 Server is an OPC Data Access 1.0, 2.0 and 2.05 compliant server. This is achieved by using an industrial grade OPC toolkit to implement its OPC interfaces. The ongoing maintenance and certification of this toolkit is managed by a company that is a charter member of the OPC Foundation.

OPC90 Server supports DCOM. DCOM allows one PC running OPC90 to provide its data via a local area network to other PCs running OPC client software. Refer to the OPC90 Remote Access section of this document for instructions on how to setup DCOM.

Throughout this document the OPC90 Server will be referenced as OPC90. The Bailey system is referenced as *BLY* which is defined to include Command Series, NETWORK 90 and INFI 90 systems.

2 Functional Description

OPC90 Server can run on the Windows NT/2000/XP/2003_Server operating system. It is implemented as a collection of blocks that are specific to each type of exception report block found within a Bailey system. This collection of blocks is stored as an OPC90 Configuration. A special block called the Device block (DEVICE) is configured to setup the communication port(s) used to access the Bailey interface, define required update rates and report various statuses of the communication channels. All other OPC90 Server blocks are linked to a DEVICE that provides the necessary information it needs to manage communication with the Bailey system. The various other OPC90 Server blocks linked to the DEVICE contain the address within Bailey where the exception report block is located. The DEVICE uses this address and block type to determine how the point is established and managed within the Bailey interface. As data is received from the Bailey interface for each of the established points it is parsed and copied to the appropriate tags within the corresponding OPC90 Server block. This implementation has several advantages:

- Extremely intuitive to Bailey users.
- Developed with an industrial grade OPC toolkit manufactured by an OPC Foundation Charter Member company insures 100% compliance to the OPC 1.0, 2.0 and 2.05 specifications.
- Point capacity is not limited by type of points utilized by the plant but only by the type of Bailey interface available (typically up to 10,000 tags).
- Alarm levels are set in real time by data received from the Bailey system (eliminates the need to maintain alarm level settings in two areas).
- Includes ability to tune Bailey control loops from OPC Client applications.
- Supports redundant Bailey interfaces or redundant communication channels to a single Bailey interface.
- Supports the ability to easily import and export OPC90 function blocks to/from comma delimited (*.csv) files. The CSV file can be easily created using Microsoft Excel and then simply imported into the OPC90 Server to create a OPC90 Configuration.

3 Installation

The installation procedure utilizes the industry standard Install shield Setup program. Do the following procedure to install OPC90. This procedure assumes that the OPC90 Server is being installed on a Windows NT/2000/XP/2003Server operating system.

1.) Log into a user account with administrator privilege.
2.) Insert the OPC90 Server installation CD into the CD drive.
3.) Run the setup program found in the root directory of the CD.
4.) Follow the instructions given by the Setup program.
5.) Insert the Hardware Key onto the parallel port or USB port.
6.) You have completed installation of OPC90 Server!

When upgrading, first uninstall using Windows add/remove programs and then run the above procedure. If running OPC90 as a service, make sure it is stopped before uninstalling.

Note that the demo version of OPC90 downloaded from the RoviSys website does not support software licensing. It must be uninstalled and the official version installed from the CD to accomplish licensing of the OPC90 software.

4 Bailey Communication Overview

Bailey utilizes a communication technique for data exchange called exception reporting. Exception reporting means the data is sent when it has changed significantly or a maximum time has expired since the last time it was sent. All exception reported data is made available to the rest of the system via a set of exception report related function blocks which are matched by an equivalent OPC90 Server block. Bailey has a series of RS232 serial based devices generically called Computer Interface Units that are utilized to receive this exception report data. Note that communication with the INICI03 interface can be either RS232 or SCSI. RoviSys is extremely knowledgeable on the use of the various Bailey interfaces and has implemented a single driver that can utilize the following types of interfaces:

Bailey Interface	Max. Number Bailey Blocks	Exception Reporting	Control Operation
NSPM01	500	No	No
IMSPM01	500	No	No
IMCPM02	500	No	No
IMCPM03	500	Yes	Yes
NCIC01	500	Yes	Yes
NCIU01	500	Yes	Yes
NCIU02	2,500	Yes	Yes
NCIU03	5,000	Yes	Yes
NCIU04	10,000	Yes	Yes
INPCI01	500	Yes	Yes
INPCI02	5,000	Yes	Yes
IIMCP01	10,000	Yes	Yes
IIMCP02	30,000	Yes	Yes
INICI01	10,000	Yes	Yes
INICI12*	10,000	Yes	Yes
INICI13*	30,000	Yes	Yes
INICI03*	30,000	Yes	Yes

- When using these interfaces, the ABB Bailey semAPI software environment is not required. The INICI12, INIC13, and INICI03 do not support dual channel serial communication. When using serial communication to the INICI12, INICI13 and INICI03, make sure the cable is attached to the port labeled “terminal” on the ABB Bailey termination unit or termination module. See the sections “Add” and “Device Definition Block” for information regarding SCSI communication with the INICI03.

- INICI03 sites containing INICT03A firmware revision ‘F’ must upgrade to revision ‘G’ or later or downgrade to revision ‘E’.
- INICI13 is comprised of the INICT13A and INNIS01 modules. The default factory settings for the INICT13A SW4 are incorrect. The INICT13A SW4 Poles 6, 7, 8 must be open (1) when using SCSI with this module.

Throughput of the supported devices is difficult to calculate empirically since the data is received and sent by exception and varies according to the data type and what has changed significantly at any given time. The exception reporting rate per general data type for RS232 and SCSI interfaces is presented in the following table:

Data Type	**RS232 @ 19.2k values / second**	**SCSI values / second**
Analog	260 / 161*	1080 / 1059*
Digital	310 / 260*	1230 / 1206*
Control Loop	106 / 91*	618 / 606*
Average	***225 / 170****	***976 / 957****

* Rate when the device block “Use DCS Timestamp” option is enabled.

Note that a few of the above mentioned devices do not support exception reporting. Specifically the NSPM01, IMSPM01, IMCPM01 and IMCPM02. Data collection from these devices is basically limited to the OPC90 Server blocks that poll to get the block values. The names of these blocks are POLL, BLK and SPEC. The remaining interfaces support the following OPC90 Server blocks and associated Bailey exception report block types:

OPC90 Server Block Type	**Bailey Block Name**	**F.C. Number**
AIL	Analog Output / Loop – AOL	30, 70, 158
BLK	Bailey Block Configuration	any function code
DAANG	Data Acquisition Analog – DAANG	177
DADIG	Data Acquisition Digital – DADIG	211
DD	Device Driver – DD	123
DIL	Digital Output / Loop – DOL	45
HAI	Harmony Analog Input	222
HAO	Harmony Analog Output	223
HDI	Harmony Digital Input	224
HDO	Harmony Digital Output	225
MODSTAT	Module Status	any module
MSDD	Multi-State Device Driver – MSDD	129
MUXCIU	Multiplexes a PC COM port to Bailey Interface for configuration related software (i.e. Bailey CADEWS,	Any function code

	Composer, G.Michaels DBDOC, etc)	
POLL	Poll Value	any block
RCM	Remote Control Memory – RCM	62
RMC	Remote Motor Control – RMC	136
RMSC	Remote Manual Set Constant – RMSC	68
SOE	Sequence of Events	99, 243
SPEC	Specification – SPEC	any block
STN	Control Station – STN	21, 22, 23, 80
TXT	Text Selector – TEXT	151
TEXTSTR	Text String - TEXTSTR	194

The common Bailey computer interfaces used to gain access to the Bailey exception report blocks presented in the above table also support the ability to allow a system to emulate and output most of these same point types. They are called “output report” block types. Bailey consoles receive the point type, exception reported data directly from the Bailey interface in the same format as if it was coming from an equivalent Bailey controller. This allows the predefined Bailey console faceplates for each of these control point types to be utilized when receiving data from the OPC90 Server report point types. Instead of addressing the tags to a block in a Bailey controller, they are addressed to a block number assigned within the Bailey interface that OPC90 is communicating. The ring and node address to use is that assigned to the interface with a fixed module address of two.

The following table presents a list of Bailey interfaces supporting the output report block types.

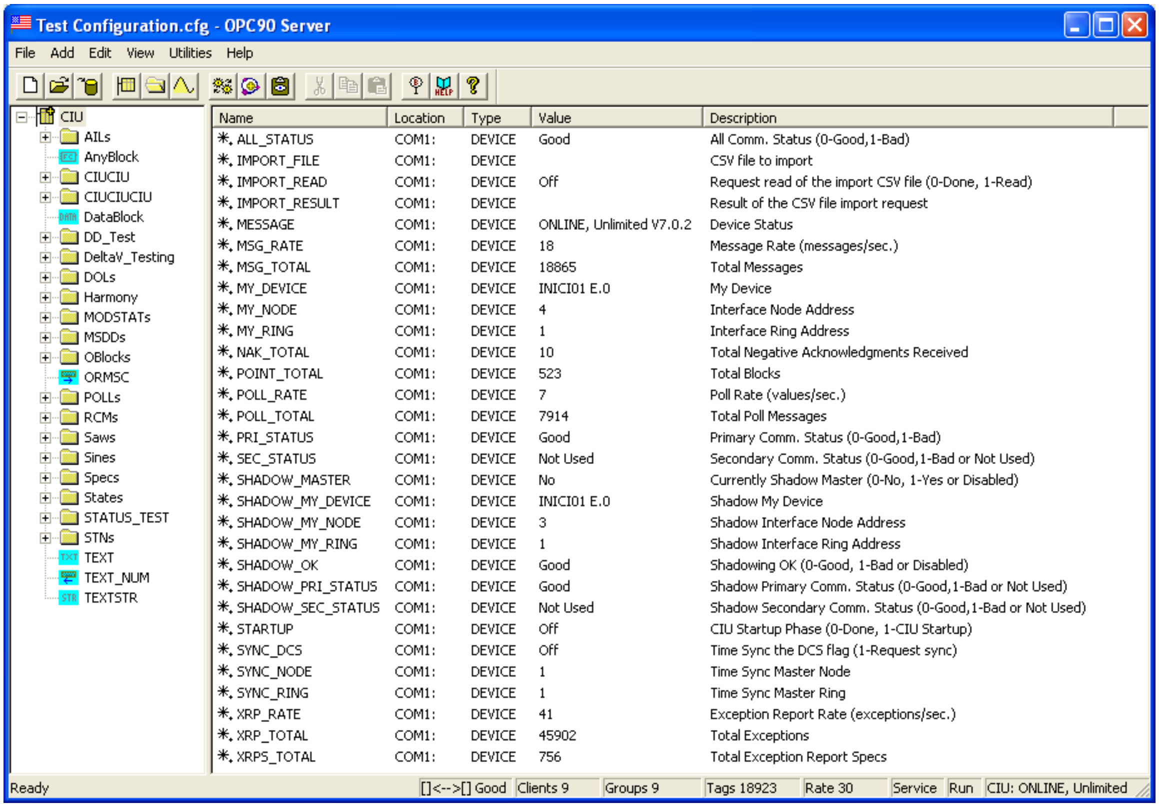
		Max. Number	**Supported by**
Bailey Interface	**Bailey System**	**of points**	**OPC90 Server**
NCIU02	Network 90	2,500	Yes
NCIU03	Network 90	5,000	Yes
NCIU04	Infi 90	10,000	Yes
INPCI02	Infi 90 / Symphony	5,000	Yes
IIMCP01	Network 90	10,000	Yes
IIMCP02	Infi 90 / Symphony	30,000	Yes
INICI01	Infi 90 / Symphony	10,000	Yes
INICI12	Infi 90 / Symphony	10,000	Yes
INICI13	Infi 90 / Symphony	30,000	Yes
INICI03	Infi 90 / Symphony	30,000	Yes

The following table summarizes the output report block types supported by OPC90 Server. These blocks enable OPC clients to source these Bailey tag types to the Bailey system.

Data Type	OPC90 Block Type	Responses as Bailey Function Code	Description
Analog	AOL	30	Analog Output Loop used to source an analog value to Bailey function codes 26, 121 and analog Bailey console tags.
Digital	DOL	45	Digital Output Loop used to source a digital value to Bailey function codes 42, 122 and digital Bailey console tags.
Digital	ODD	123	Output Device Driver used to source device driver data to a Bailey DD console tag. The Bailey console can issue on or off commands to this block with the client indicating results using a set of feedback indicators.
Digital	OMSDD	129	Output Multi-State Device Driver used to source multi-state device driver data to a Bailey MSDD console tag. The Bailey console can issue state commands to this block with the client indicating results using a set of feedback indicators.
Digital	ORCM	62	Output Remote Control Memory used to source remote control memory data to a Bailey RCM console tag. The Bailey console can issue on or off commands to this block with the client indicating results using a feedback indicator.
Digital	ORMC	136	Output Remote Motor Control used to source remote motor control data to a Bailey RMC console tag. The Bailey console can issue start or stop commands to this block with the client indicating results using a set of permissive and feedback indicators.
Analog	ORMSC	68	Output Remote Manual Set Constant used to source remote manual set data to a Bailey RMSC console tag. The Bailey console can issue set point values to this block for use by the client.
Analog	OSTN	21, 22, 23, 80	PID control loops (OSTN stands for Output Station Control) used to source PID control data to a Bailey STN console tag. The Bailey console can issue PID control commands (set point, control output, mode) to this block with the client responds back with process variable and other STN indicators.

5 OPC90 Server Application Menu Items

The following picture shows the OPC90 Server main menu items available to the program user for managing databases, editing the database, selecting run time activities and accessing program information along with online help.



- CIU
  - AILs
  - AnyBlock
  - CIUCIU
  - CIUCIUCIU
  - DataBlock
  - DD_Test
  - DeltaV_Testing
  - DOLs
  - Harmony
  - MODSTATs
  - MSDDs
  - OBlocks
  - ORMSC
  - POLLs
  - RCMs
  - Saws
  - Sines
  - Specs
  - States
  - STATUS_TEST
  - STNs
  - TEXT
  - TEXT_NUM
  - TEXTSTR

Name	Location	Type	Value	Description
ALL_STATUS	COM1:	DEVICE	Good	All Comm. Status (0-Good,1-Bad)
IMPORT_FILE	COM1:	DEVICE		CSV file to import
IMPORT_READ	COM1:	DEVICE	Off	Request read of the import CSV file (0-Done, 1-Read)
IMPORT_RESULT	COM1:	DEVICE		Result of the CSV file import request
MESSAGE	COM1:	DEVICE	ONLINE, Unlimited V7.0.2	Device Status
MSG_RATE	COM1:	DEVICE	18	Message Rate (messages/sec.)
MSG_TOTAL	COM1:	DEVICE	18865	Total Messages
MY_DEVICE	COM1:	DEVICE	INICI01 E.0	My Device
MY_NODE	COM1:	DEVICE	4	Interface Node Address
MY_RING	COM1:	DEVICE	1	Interface Ring Address
NAK_TOTAL	COM1:	DEVICE	10	Total Negative Acknowledgments Received
POINT_TOTAL	COM1:	DEVICE	523	Total Blocks
POLL_RATE	COM1:	DEVICE	7	Poll Rate (values/sec.)
POLL_TOTAL	COM1:	DEVICE	7914	Total Poll Messages
PRI_STATUS	COM1:	DEVICE	Good	Primary Comm. Status (0-Good,1-Bad)
SEC_STATUS	COM1:	DEVICE	Not Used	Secondary Comm. Status (0-Good,1-Bad or Not Used)
SHADOW_MASTER	COM1:	DEVICE	No	Currently Shadow Master (0-No, 1-Yes or Disabled)
SHADOW_MY_DEVICE	COM1:	DEVICE	INICI01 E.0	Shadow My Device
SHADOW_MY_NODE	COM1:	DEVICE	3	Shadow Interface Node Address
SHADOW_MY_RING	COM1:	DEVICE	1	Shadow Interface Ring Address
SHADOW_OK	COM1:	DEVICE	Good	Shadowing OK (0-Good, 1-Bad or Disabled)
SHADOW_PRI_STATUS	COM1:	DEVICE	Good	Shadow Primary Comm. Status (0-Good,1-Bad or Not Used)
SHADOW_SEC_STATUS	COM1:	DEVICE	Not Used	Shadow Secondary Comm. Status (0-Good,1-Bad or Not Used)
STARTUP	COM1:	DEVICE	Off	CIU Startup Phase (0-Done, 1-CIU Startup)
SYNC_DCS	COM1:	DEVICE	Off	Time Sync the DCS flag (1-Request sync)
SYNC_NODE	COM1:	DEVICE	1	Time Sync Master Node
SYNC_RING	COM1:	DEVICE	1	Time Sync Master Ring
XRP_RATE	COM1:	DEVICE	41	Exception Report Rate (exceptions/sec.)
XRP_TOTAL	COM1:	DEVICE	45902	Total Exceptions
XRPS_TOTAL	COM1:	DEVICE	756	Total Exception Report Specs

Ready | []<-->[] Good | Clients 9 | Groups 9 | Tags 18923 | Rate 30 | Service | Run | CIU: ONLINE, Unlimited

The “File” menu item supports generation of new databases, opening an existing database, saving a database, enabling / disabling auto save, creation of database points by importing a CSV file and saving of the database in CSV file format.

The “Add” menu item supports addition of new database devices, groups and blocks.

The “Edit” menu item supports deletion of database entities (devices, groups and blocks), definition of communication port parameters, mapping of engineering unit strings, definition of text messages, setting up red tag users and viewing of database entity properties.

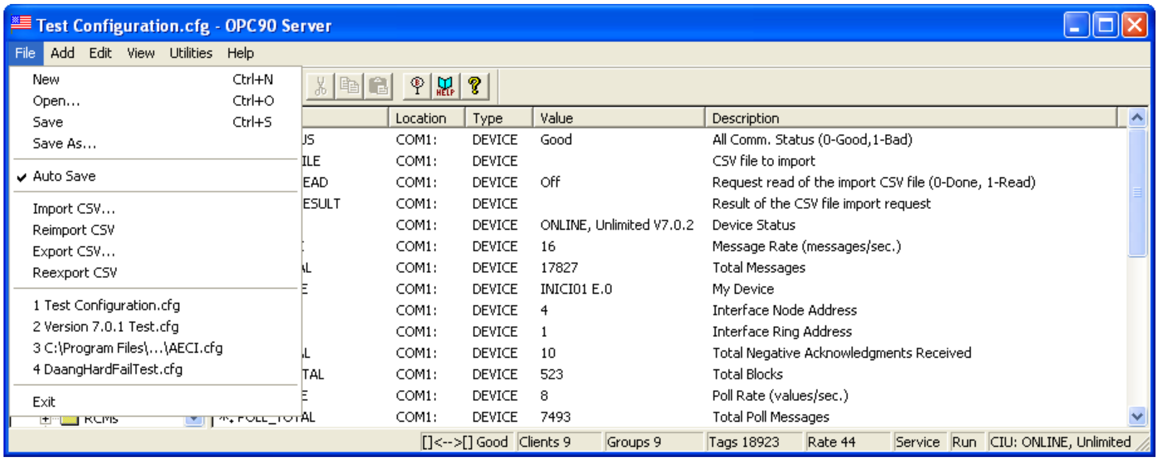
The “View” menu item supports selection of monitor mode, program status bar, starting up in run time mode and enabling or disabling OPC90 as a service..

The “Utilities” menu item can be used to run the Windows service manager or DCOMCNFG programs along with viewing OPC90 log files.

The “Help” menu item is used to determine program version number and invoking online help.

5.1 File

The following picture shows the available File menu items:



	Location	Type	Value	Description
US	COM1:	DEVICE	Good	All Comm. Status (0-Good,1-Bad)
ILE	COM1:	DEVICE		CSV file to import
EAD	COM1:	DEVICE	Off	Request read of the import CSV file (0-Done, 1-Read)
ESULT	COM1:	DEVICE		Result of the CSV file import request
	COM1:	DEVICE	ONLINE, Unlimited V7.0.2	Device Status
	COM1:	DEVICE	16	Message Rate (messages/sec.)
L	COM1:	DEVICE	17827	Total Messages
E	COM1:	DEVICE	INICI01 E.0	My Device
	COM1:	DEVICE	4	Interface Node Address
	COM1:	DEVICE	1	Interface Ring Address
L	COM1:	DEVICE	10	Total Negative Acknowledgments Received
TAL	COM1:	DEVICE	523	Total Blocks
E	COM1:	DEVICE	8	Poll Rate (values/sec.)
POLL_TOTAL	COM1:	DEVICE	7493	Total Poll Messages

[]<-->[] Good | Clients 9 | Groups 9 | Tags 18923 | Rate 44 | Service | Run | CIU: ONLINE, Unlimited

5.1.1 New

Select “New” to create a new database. The current database will be closed. If any database entities had been changed without being saved the user is given the opportunity to save the database before completing the new database request.

5.1.2 Open

Select “Open” to open a database that had been previously created. The OPC90 convention is to open databases stored in the subdirectory called CFG (configuration files).

5.1.3 Save

Select “Save” to save the currently opened database. The OPC90 convention is to save the database in the subdirectory called CFG (configuration files). The last saved database becomes the OPC90 working database that is automatically restored when the program is opened by the user or another OPC client. Therefore, it is important to save a newly created database to set it as the working database. OPC90 configurations can be saved using any file name and extension. The general accepted naming convention adopted by RoviSys is to use a file extension of “.CFG” to denote it’s a configuration file. As just mentioned a subdirectory is generated by the OPC90 install set named CFG as the intended place to save OPC90 configurations.

5.1.4 Save As

Select “Save As” to save the database under a new name. This newly named database will become the working database the next time the user or OPC client starts OPC90.

5.1.5 Auto Save

Select “Auto Save” to enable / disable automatic database saving. When enabled, the database will automatically be saved whenever OPC90 is currently communicating with the DCS. By default these auto saves will occur every 60 seconds whenever changes have been made to the database or new real time specification data has been received. The default auto save time can be changed when this feature is enabled. It is best to run with this feature enabled to avoid accidental loss of database changes. It will also keep the database current with the latest snap shot of real time values such as alarm limits, ranges, spans, engineering units and others received as exception report specifications in real time. These values are restored from the database when OPC90 is first started thus replacing default settings for actual system settings while waiting for interface startup to complete.

5.1.6 Import CSV

Select “Import CSV” to define a new database (after selecting File->New) or add additional points to an existing database. The OPC90 convention is to import CSV files stored in the subdirectory called CSV. Comma Separated Variable files (CSV) can be generated in a program such as Microsoft Excel or a text editor like Notepad. Each line in these files define OPC90 devices and blocks. See the section that deals with CSV file formats for additional information. This function will be blocked if OPC clients are currently attached to OPC90 or it is currently operating in monitor mode.

5.1.7 Reimport CSV

Select “Reimport CSV” to import the last CSV file that had been previously imported. This function will be blocked if OPC clients are currently attached to OPC90 or it is currently operating in monitor mode.

5.1.8 Export CSV

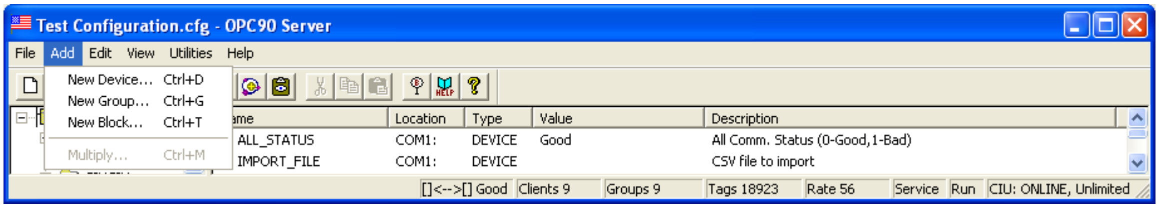
Select “Export CSV” to save the current database in Comma Separate Variable format. The OPC90 convention is to store these files in the CSV directory. This function is useful for saving the database in a format that can be later imported after making “bulk” editing changes to it or when upgrading from one version of OPC90 to another where additional tags have been defined for any given OPC90 block type. See the section entitled “Trouble Shooting Hints - Cannot See all documented block attributes” for further discussion.

5.1.9 Reexport CSV

Select “Reexport CSV” to save the current database in CSV format under the previously exported name. This feature is like a fast save.

5.2 Add

The following picture shows the available Add menu items:



ame	Location	Type	Value	Description
ALL_STATUS	COM1:	DEVICE	Good	All Comm. Status (0-Good,1-Bad)
IMPORT_FILE	COM1:	DEVICE		CSV file to import

Select “New Device” to add a new device to the database. A database must have at least one device definition. The name given to the device becomes the first part of the OPC tag name used by clients when accessing a piece of OPC data from OPC90. A device defines operational characteristics that OPC90 uses when communicating with the physical Bailey interface, often generically called a CIU (Computer Interface Unit). One of the most important communication characteristics that must be considered is the physical PC communication channel that has been attached to the CIU. Typically this channel is an RS232 port that must be setup using the Edit->Ports menu item. For the INICI03 interface the communication channel could be RS232 or SCSI. When it is a SCSI channel, no additional communication setup is required beyond selecting the SCSI port that has been cabled to the INICI03 INICT03A module. See the DEVICE block for more details.

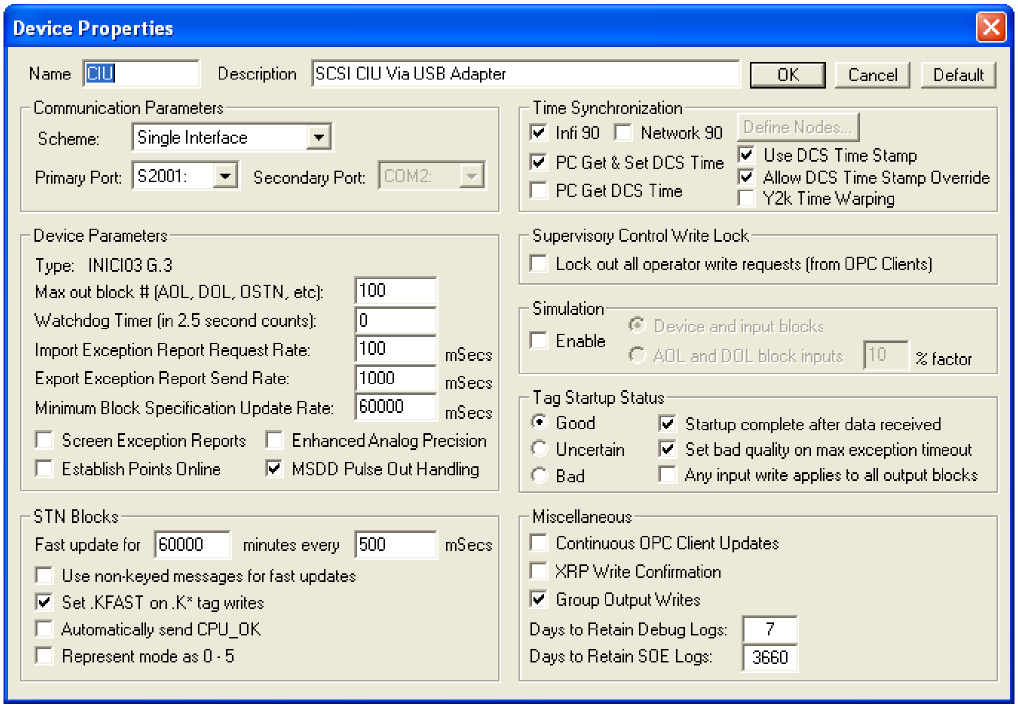
Select “New Group” to defined a folder under a device in which collections of other OPC90 groups and blocks can be configured. Groups allow data organization within the OPC90 database. They are not required but if used the name given to the group becomes part of the OPC tag name used by clients when accessing OPC data from OPC90.

Select “New Block” to add an OPC90 block to a device or in a device group. OPC90 blocks are given a name that typically identifies its purpose and becomes part of the OPC tag name used by clients when accessing OPC data from OPC90. The block type defines what type of data to expect from the Bailey system for the given block and the address at which it resides.

The “Multiply” selection allows bulk duplication of the last selected block to be added to the database. It has limited use in real world applications, most typically used to automatically generate a series of output type blocks suitable for OPC client programmatic generated output values.

5.2.1 Device

When the add device item is selected the following dialog is displayed:



Device Properties

Name: CIU
Description: SCSI CIU Via USB Adapter

OK | Cancel | Default

Communication Parameters
- Scheme: Single Interface
- Primary Port: S2001:
- Secondary Port: COM2:

Time Synchronization
- ☑ Infi 90
- ☐ Network 90
- Define Nodes...
- ☑ PC Get & Set DCS Time
- ☐ PC Get DCS Time
- ☑ Use DCS Time Stamp
- ☑ Allow DCS Time Stamp Override
- ☐ Y2k Time Warping

Device Parameters
- Type: INICI03 G.3
- Max out block # (AOL, DOL, OSTN, etc): 100
- Watchdog Timer (in 2.5 second counts): 0
- Import Exception Report Request Rate: 100 mSecs
- Export Exception Report Send Rate: 1000 mSecs
- Minimum Block Specification Update Rate: 60000 mSecs
- ☐ Screen Exception Reports
- ☐ Enhanced Analog Precision
- ☐ Establish Points Online
- ☑ MSDD Pulse Out Handling

Supervisory Control Write Lock
- ☐ Lock out all operator write requests (from OPC Clients)

Simulation
- ☐ Enable
- ● Device and input blocks
- ○ AOL and DOL block inputs
- 10 % factor

Tag Startup Status
- ● Good
- ○ Uncertain
- ○ Bad
- ☑ Startup complete after data received
- ☑ Set bad quality on max exception timeout
- ☐ Any input write applies to all output blocks

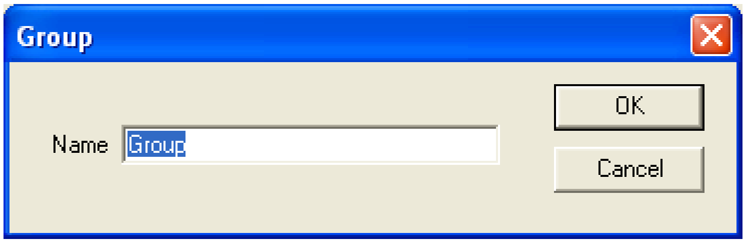
STN Blocks
- Fast update for 60000 minutes every 500 mSecs
- ☐ Use non-keyed messages for fast updates
- ☑ Set .KFAST on .K* tag writes
- ☐ Automatically send CPU_OK
- ☐ Represent mode as 0 - 5

Miscellaneous
- ☐ Continuous OPC Client Updates
- ☐ XRP Write Confirmation
- ☑ Group Output Writes
- Days to Retain Debug Logs: 7
- Days to Retain SOE Logs: 3660

A device name should be defined that usefully identifies it. The device name becomes part of the OPC tag name. An optional device description can be defined to provide additional device information. For most installations the default settings for the device properties are appropriate. Note that the setting for the "Type" is ***automatically determined*** when the server begins to communicate with the Bailey CIU. It will indicate "To Be Determined" (TDB) or CIU01 on initial startup. See the DEVICE block description for further details on each of these settings.

5.2.2 Group

When the add group item is selected the following dialog is displayed:



Group

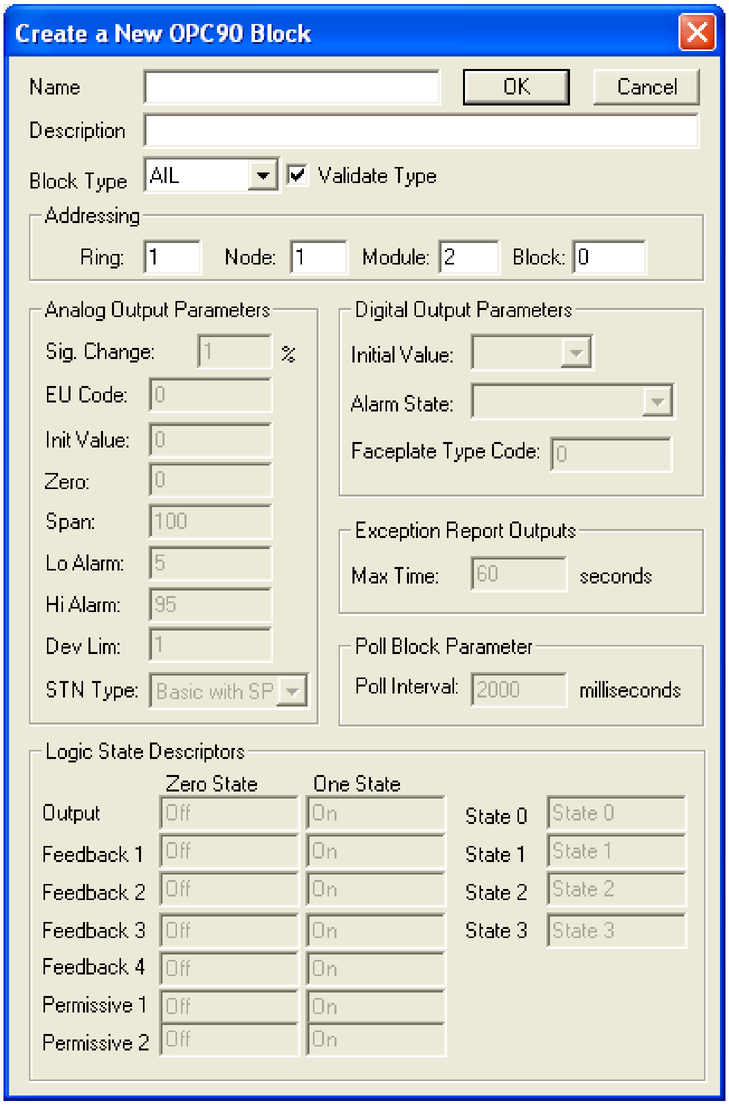
Name: Group

OK | Cancel

A group name can be defined describing the purpose of the blocks configured within the group. The group name becomes part of the OPC tag name.

5.2.3 Block

When the add block item is selected the following dialog is displayed:



Name

Description

Block Type: AIL ☑ Validate Type

Addressing

Ring: 1 Node: 1 Module: 2 Block: 0

Analog Output Parameters

Sig. Change: 1 %
EU Code: 0
Init Value: 0
Zero: 0
Span: 100
Lo Alarm: 5
Hi Alarm: 95
Dev Lim: 1
STN Type: Basic with SP

Digital Output Parameters

Initial Value:
Alarm State:
Faceplate Type Code: 0

Exception Report Outputs

Max Time: 60 seconds

Poll Block Parameter

Poll Interval: 2000 milliseconds

Logic State Descriptors

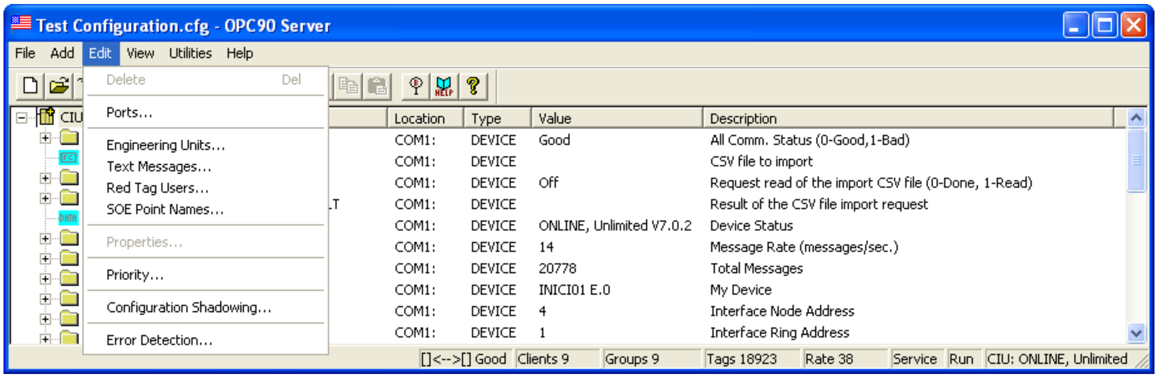
	Zero State	One State		
Output	Off	On	State 0	State 0
Feedback 1	Off	On	State 1	State 1
Feedback 2	Off	On	State 2	State 2
Feedback 3	Off	On	State 3	State 3
Feedback 4	Off	On		
Permissive 1	Off	On		
Permissive 2	Off	On		

This dialog is used to add all block types supported by OPC90. A block name must be defined which becomes part of the OPC tag name used to access the various block data tags. An optional block descriptor can be entered that documents the purpose of the block. The block type list box allows selection of the specific block type being defined. The addressing section is used to define the address within the Bailey system that provides the block data. The other field definitions will be enabled based on the block type selected. See the blocks section for further details on each specific setting.

When adding a block while OPC90 is currently communicating with the ABB Bailey system, the “validate type” check box will also be displayed. It is best to leave this validation enabled since it will verify the block type being added actually exists within the ABB Bailey system.

5.3 Edit

The following picture shows the available Edit menu items:



Location	Type	Value	Description
COM1:	DEVICE	Good	All Comm. Status (0-Good,1-Bad)
COM1:	DEVICE		CSV file to import
COM1:	DEVICE	Off	Request read of the import CSV file (0-Done, 1-Read)
COM1:	DEVICE		Result of the CSV file import request
COM1:	DEVICE	ONLINE, Unlimited V7.0.2	Device Status
COM1:	DEVICE	14	Message Rate (messages/sec.)
COM1:	DEVICE	20778	Total Messages
COM1:	DEVICE	INICI01 E.0	My Device
COM1:	DEVICE	4	Interface Node Address
COM1:	DEVICE	1	Interface Ring Address

[]<-->[] Good | Clients 9 | Groups 9 | Tags 18923 | Rate 38 | Service | Run | CIU: ONLINE, Unlimited

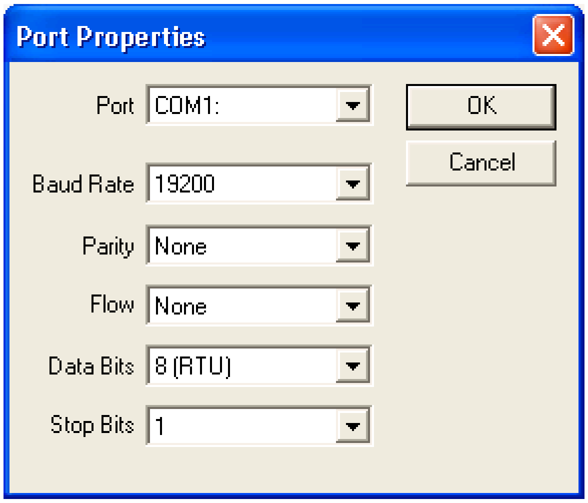
5.3.1 Deletion

Select “Edit->Delete” to delete the selected block, group or device. Be careful when selecting this item. If a group is deleted, all blocks under that group are included in the deletion. If a device is deleted, all groups and blocks under that device are included in the deletion.

Device deletion is not allowed when in runtime mode of operation. Block deletions are allowed in runtime mode of operation as long as they are not providing data to connected OPC clients. This rule is enforced across shadowed databases. So for example, if an OPC client is connected to a block on one shadowed server but not the other, the block remains undeletable.

5.3.2 Ports

Select “Edit->Ports” to define the communication characteristics of any given PC port assigned to a device. When this item is selected the following dialog is displayed:

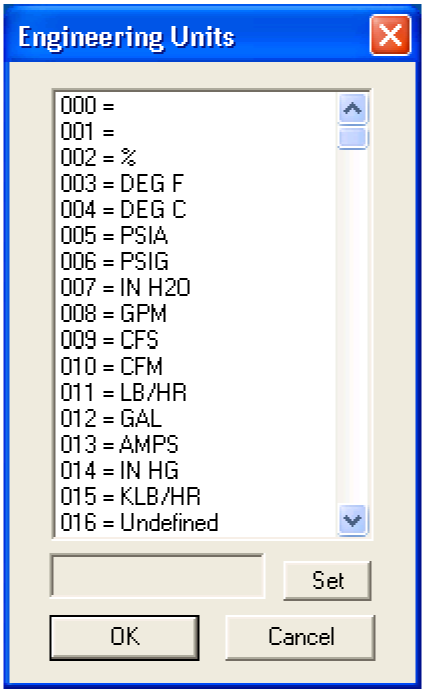


Port: COM1:
Baud Rate: 19200
Parity: None
Flow: None
Data Bits: 8 (RTU)
Stop Bits: 1

OPC90 uses the communication characteristics setup with this item and not those configured under the windows global port settings. Most Bailey interfaces utilize the settings shown by this dialog. The exception is the CIC module which has a maximum baud rate capability of 9600 baud.

5.3.3 Engineering Units

Select “Edit->Engineering Units” to defined Bailey engineering unit code to engineering string mapping. The various analog values received from the Bailey system are already in a particular engineering unit. Those blocks responsible for returning exception reported analog values also identify the engineering units using a predefined Bailey code in the range of 0 – 255. The OPC90 blocks designed to return these values also include two OPC tags called EU and EU_TEXT. The EU tag returns the Bailey EU code associated with the analog value. The EU_TEXT tag returns the Bailey engineering units code converted to a string value. Bailey predefines the first 16 codes. The following dialog is displayed when this menu item is selected:

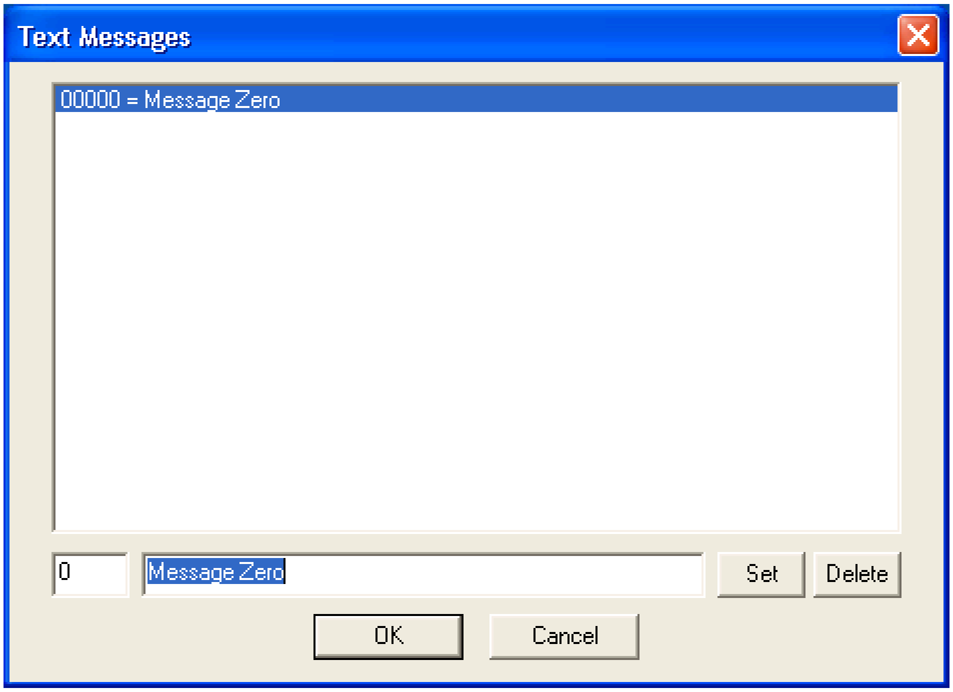


000 =
001 =
002 = %
003 = DEG F
004 = DEG C
005 = PSIA
006 = PSIG
007 = IN H2O
008 = GPM
009 = CFS
010 = CFM
011 = LB/HR
012 = GAL
013 = AMPS
014 = IN HG
015 = KLB/HR
016 = Undefined

Use this dialog to define the mapping between Bailey engineering unit codes and the string to be associated with each code. (Note that engineering unit mapping can also be defined using the “Import CSV” program feature.) The map is global to all OPC90 blocks that return exception reported analog values. Use of the EU_TEXT OPC tag is optional. Its purpose is to simplify OPC client display generation and allow the source of engineering unit definition to remain singularly at the Bailey module level. Note that engineering unit code to string mapping is changeable online while OPC90 is providing data to attached clients. The maximum string size for an engineering unit code is 16 characters.

5.3.4 Text Messages

Select “Edit->Text Messages” to defined Bailey text message number to text message string mapping. (Note that text message number mapping can also be defined using the “Import CSV” program feature.) The Bailey TEXT block (F.C. 151) exception reports text message numbers that can be received and reported as OPC tags with the OPC90 TEXT block. This block provides both a message number tag called MSG_OUT and message string tag called MSG_OUT_TEXT. When this menu item is selected the following dialog is displayed:



00000 = Message Zero

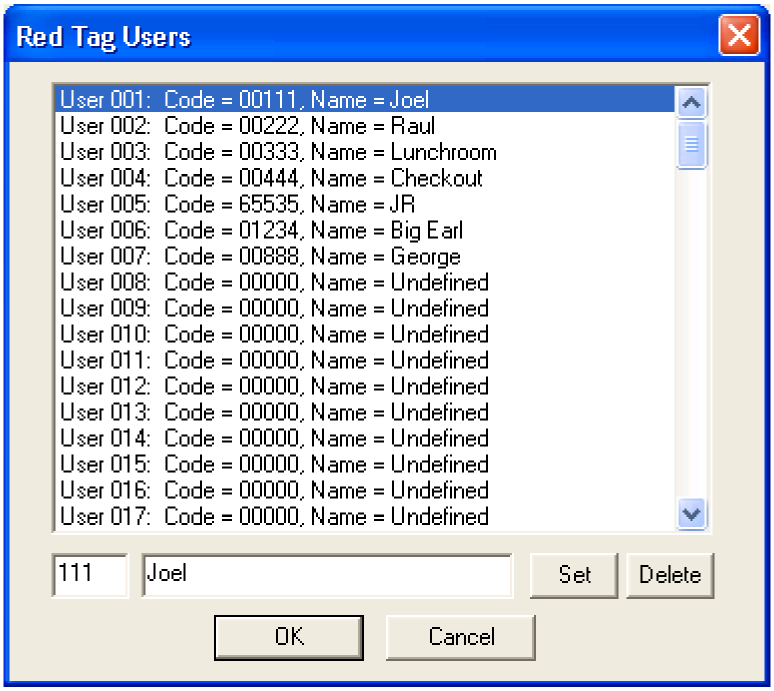
0

Message Zero

The text message number to string value mapping is global to all OPC90 TEXT blocks. Use of the MSG_OUT_TEXT OPC tag is optional. Its purpose is to simplify OPC client display of Bailey text messages. Note that text message mapping is changeable online while OPC90 is providing data to attached clients. The maximum string size for a text message is 132 characters. Up to 10,000 message numbers can be mapped.

5.3.5 Red Tag Users

Select “Edit->Red Tag Users” to define users for the Bailey red tag system. OPC90 supports the definition of 128 red tag users. This dialog is used to assign a user code to a user name. (Note that red tag user mapping can also be defined using the “Import CSV” program feature.) The Bailey red tag system allows users to mark blocks to be in the red tag state. The Bailey red tag system supports up to 3 simultaneous users to have a given block marked in the red tag state. Within the Bailey system, red tag users are managed as user codes in the range of 1 to 65535. This dialog allows these codes to be assigned user names. Use of this name mapping is optional. When a red tag code is encountered that is not mapped to a name, the code will be reported instead of a name. When this menu item is selected the following dialog is displayed:



User 001: Code = 00111, Name = Joel
User 002: Code = 00222, Name = Raul
User 003: Code = 00333, Name = Lunchroom
User 004: Code = 00444, Name = Checkout
User 005: Code = 65535, Name = JR
User 006: Code = 01234, Name = Big Earl
User 007: Code = 00888, Name = George
User 008: Code = 00000, Name = Undefined
User 009: Code = 00000, Name = Undefined
User 010: Code = 00000, Name = Undefined
User 011: Code = 00000, Name = Undefined
User 012: Code = 00000, Name = Undefined
User 013: Code = 00000, Name = Undefined
User 014: Code = 00000, Name = Undefined
User 015: Code = 00000, Name = Undefined
User 016: Code = 00000, Name = Undefined
User 017: Code = 00000, Name = Undefined

111 Joel

Use the list box to select a specific user (1 – 128) to be defined. The user code and name can be edited in the fields below the list box. Use the tab key to signify entry of a new value. Click on the set button to set the user code / name. Click on the delete button to delete the user code / name definition. Red tag user definition can also be accomplished using the OPC90 import feature. Consult the “CSV file format” section for specific information on how to define red tag users.

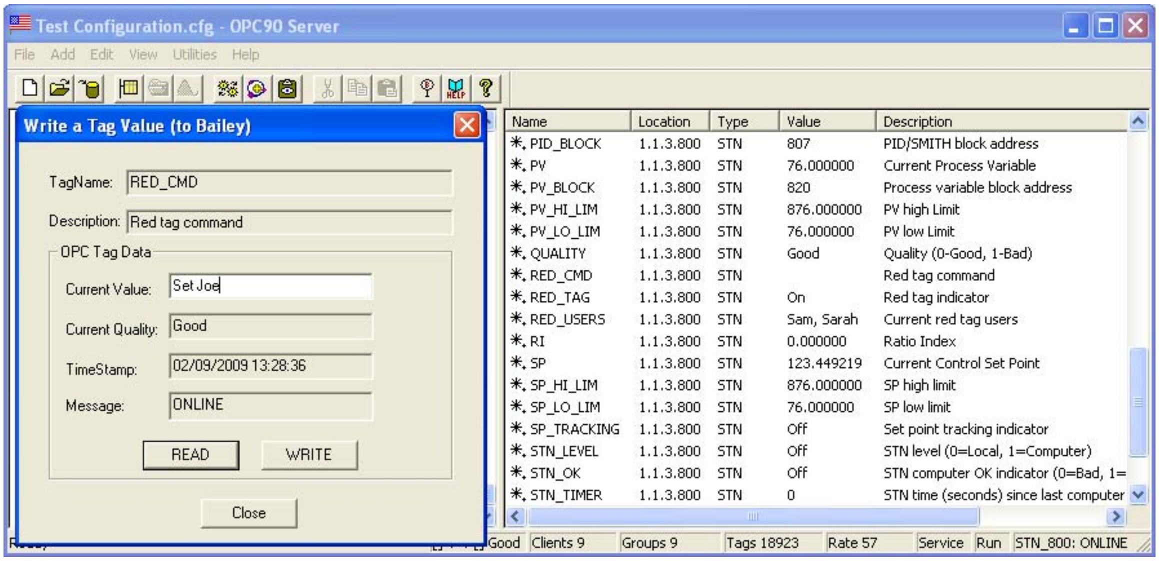
OPC90 includes three OPC tags associated with managing red tags. These tags are “.RED_TAG”, “.RED_CMD” and “.RED_USERS”. These tags are valid for the DAANG, DD, MSDD, RCM, RMC and STN blocks.

The “.RED_TAG” OPC tag reports whether or not the block is currently in the red tag state. When set, the block is red tagged. This tag value is an exception reported value.

The “.RED_USERS” OPC tag reports the users that currently have the block in the red tag state. As previously mentioned, up to three users can have the block red tagged. This is a string tag and will report the users separated by commas. If a user code is returned that has not been mapped by this dialog, the user code will be reported instead of a name. The red tag user codes are not exception reported and must be polled. Whenever a block is in the red tag state, the user codes will be polled once per minute. This allows OPC90 to determine red tag users generated outside of OPC90 such as from a ABB Bailey operator console.

The “.RED_CMD” OPC tag is used to command red tag users to attach and detach with the block. The format of the command is simple. The command name is followed by the red tag user name or code. The commands for attaching red tag users are ON, SET or TAG. The commands for detaching red tag users are OFF, RESET or UNTAG. A space must be included between the command and user name or code. Command entry including the user name is not case sensitive. The result of the command is returned in this tag.

The following example shows the three tags associated with red tagging along with the results of the set command.


Test Configuration.cfg - OPC90 Server
File
Add
Edit
View
Utilities
Help
Write a Tag Value (to Bailey)
READ
WRITE
Close

TagName: RED_CMD

Description: Red tag command

OPC Tag Data

Current Value: Set Joe

Current Quality: Good

TimeStamp: 02/09/2009 13:28:36

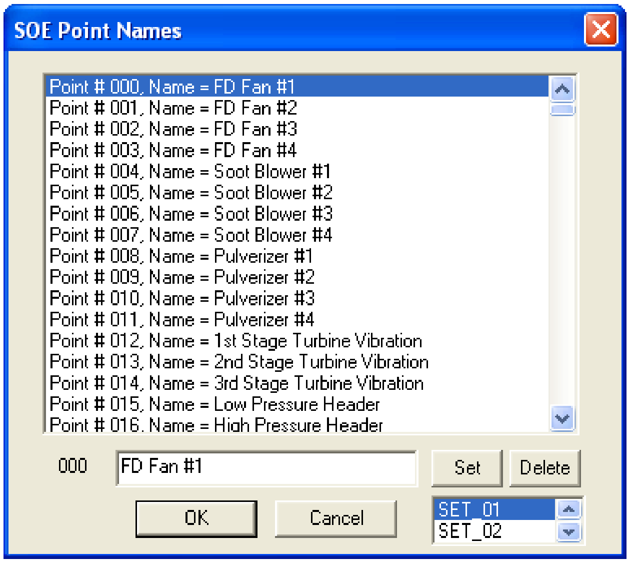
Message: ONLINE

Name	Location	Type	Value	Description
PID_BLOCK	1.1.3.800	STN	807	PID/SMITH block address
PV	1.1.3.800	STN	76.000000	Current Process Variable
PV_BLOCK	1.1.3.800	STN	820	Process variable block address
PV_HI_LIM	1.1.3.800	STN	876.000000	PV high Limit
PV_LO_LIM	1.1.3.800	STN	76.000000	PV low Limit
QUALITY	1.1.3.800	STN	Good	Quality (0-Good, 1-Bad)
RED_CMD	1.1.3.800	STN		Red tag command
RED_TAG	1.1.3.800	STN	On	Red tag indicator
RED_USERS	1.1.3.800	STN	Sam, Sarah	Current red tag users
RI	1.1.3.800	STN	0.000000	Ratio Index
SP	1.1.3.800	STN	123.449219	Current Control Set Point
SP_HI_LIM	1.1.3.800	STN	876.000000	SP high limit
SP_LO_LIM	1.1.3.800	STN	76.000000	SP low limit
SP_TRACKING	1.1.3.800	STN	Off	Set point tracking indicator
STN_LEVEL	1.1.3.800	STN	Off	STN level (0=Local, 1=Computer)
STN_OK	1.1.3.800	STN	Off	STN computer OK indicator (0=Bad, 1=
STN_TIMER	1.1.3.800	STN	0	STN time (seconds) since last computer

Good | Clients 9 | Groups 9 | Tags 18923 | Rate 57 | Service | Run | STN_800: ONLINE

5.3.6 SOE Point Names

Select “Edit->SOE Point Names” to define sequence of event point names referenced by the OPC90 SOE blocks. Definition of four sets of SOE point names is supported. Each set defines 512 points. When SOE data is received from the ABB Bailey system, that data identifies points by their number (0 – 511). Those numbers are associated with point names defined by this dialog. The various SOE files generated by OPC90 contain both the point number and point name. When this menu item is selected the following dialog is displayed:


SOE Point Names

Point # 000, Name = FD Fan #1
Point # 001, Name = FD Fan #2
Point # 002, Name = FD Fan #3
Point # 003, Name = FD Fan #4
Point # 004, Name = Soot Blower #1
Point # 005, Name = Soot Blower #2
Point # 006, Name = Soot Blower #3
Point # 007, Name = Soot Blower #4
Point # 008, Name = Pulverizer #1
Point # 009, Name = Pulverizer #2
Point # 010, Name = Pulverizer #3
Point # 011, Name = Pulverizer #4
Point # 012, Name = 1st Stage Turbine Vibration
Point # 013, Name = 2nd Stage Turbine Vibration
Point # 014, Name = 3rd Stage Turbine Vibration
Point # 015, Name = Low Pressure Header
Point # 016, Name = High Pressure Header

000 FD Fan #1

SET_01
SET_02

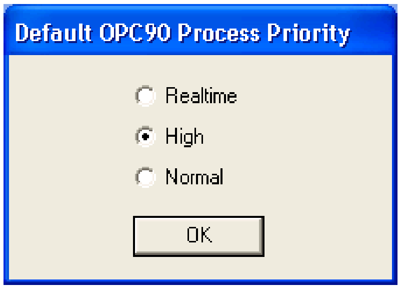
Select the current set (SET_01 to SET_04) to be defined using the list box at the bottom right of the dialog. The current point definition for that set is displayed in the large list box. The point number and name is displayed. Click on a point number to be edited. Its point number and name are displayed at the bottom of the dialog. Type in the point name and click the “Set” button to define that point. Use the tab key to signify entry of a new value. Click the “Delete” button to undefined the selected point. Point names must be unique within each set. SOE point definition can also be accomplished using the OPC90 import feature. Consult the “CSV file format” section for specific information on how to define SOE point names.

5.3.7 Properties

Select “Edit->Properties” to edit the current definitions setup for the selected device, group or block. The appropriate properties dialog will be displayed based on whether the device, group or block is the last selected database entity.

5.3.8 Priority

Select “Edit->Priority” to edit the default process priority that OPC90 will run. When this menu item is selected the following dialog is displayed:


Default OPC90 Process Priority

○ Realtime
● High
○ Normal

As can be seen by this dialog, available priority selections are “Normal”, “High” and “Realtime”. OPC90 switches itself to the new priority as soon as the selection is made. It is not necessary to exit OPC90 and run it again for a new priority to be established. Note that when running OPC90 as a service and a second instance is attached to that service, only the priority of the service is changed. The second program instance always remains at the "Normal" priority. Installations having larger databases or OPC clients running at a higher priority then "Normal" might realize an increase in performance by raising the priority of OPC90.

5.3.9 Configuration Shadowing Between Redundant Servers

The configuration shadowing feature can be used to automatically keep the database and other program features synced between two different PCs running OPC90 as redundant servers. It also manages CIU online states especially important when same addressed CIUs are setup for redundant OPC90 servers (see more on this feature at the end of this section).

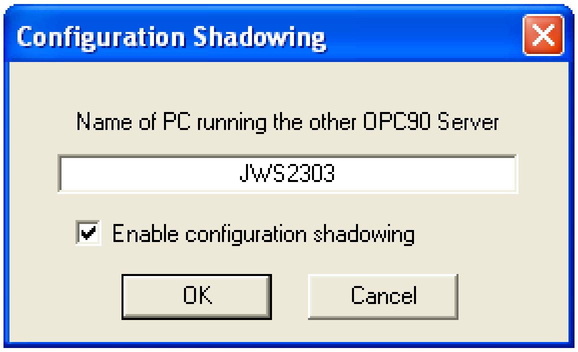
Configuration shadowing must only be used between OPC90 servers of the same revision level. Unpredictable results will occur when shadowing between two unlike software revision levels.

Configuration shadowing is not supported when the redundant OPC90 servers are running as a service from the system account. Running as a service from a privileged user account is supported.

When operating in runtime mode, it is important to make database changes using the current OPC90 running as shadow master. This can be determined by looking at the device block "SHADOW_MASTER" tag while in monitor mode.

Configuration shadowing works with the File Import and Export features, and all selections available from the Add and Edit menu selections. Its purpose is to minimize the engineering effort required to maintain redundant OPC90 servers. The File | Auto Save feature is not shadowed and must be individually setup for each server.

Select "Edit->Configuration Shadowing" to enable / disable configuration shadowing. When this menu item is selected the following dialog is displayed:



Name of PC running the other OPC90 Server: JWS2303

☑ Enable configuration shadowing

Type the name of the other PC that is running OPC90. Configuration shadowing is enabled when the "Enable configuration shadowing" checkbox is checked. It is disabled when unchecked. The state of configuration shadowing is displayed in the OPC90 program window status bar as follows:

[] [] Off
[]←→[] Good
[]< >[] Bad
Bad Versions

The Device block also has tags that can be accessed by OPC clients to monitor the state of configuration shadowing. See the Device block for more details of what can be monitored.

Configuration shadowing has been designed to keep the standard OPC90 ABB, CFG, CSV and SOE directories synced between two OPC90 servers running on different PCs. These are sub-directories of the C:\Program Files\OPC90 Server\ directory (or the alternative path setup during program installation). Therefore, if the user stores files outside of these locations, configuration shadowing should not be used.

In addition to keeping the above mentioned sub-directories synced with each other, configuration shadowing also copies runtime changes to the database such as block modifications, additions and deletions. So for example, when blocks are added using the file import feature, those blocks are also added to the other OPC90 server database.

Configuration shadowing will dynamically determine which OPC90 is operating as the “Shadow Master” and “Shadow Slave”. Data such as the CIU state (online or standby), OPC90 start time and CIU addresses determine this role. The Device block has a tag that reports the current role. Although no adverse effects will occur if editing is done on the shadow slave, it is best to do this on the OPC90 currently operating as the shadow master. The current shadow state can be determined from the Device block faceplate.

5.3.9.1 Redundant Same Address CIUs

Configuration shadowing shares the communication state and address of CIUs between the two OPC90 servers. This data is useful when using OPC90 AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC and OSTN blocks. Nodes within the ABB Bailey system that need to receive data from these blocks do not need to be concerned with getting the block data from two different CIU addresses. The redundant OPC90 servers can be setup with CIUs having the same address. Only one CIU will be commanded online. The other will have the database downloaded to its CIU and ready to be commanded online when communication with the other OPC90 server fails or the other OPC90 server communication with its CIU fails. *For this type of setup, it is **important** to configure the OPC90 Device block watchdog time to a non-zero value. Settings in the range of 2-4 are common.* See the device block for more information about the watchdog time.

Note that a network failure will cause the backup OPC90 server to command its CIU online if configuration shadowing cannot communicate with the other OPC90 server. By design, this will occur between one and two minutes after the network failure occurs. If the other CIU is still online, the backup being commanded online will fault with a code indicating a same address was detected. Therefore, don’t conclude that CIU red light conditions are always the result of faulty hardware. Make sure network interruptions are not occurring.

If configuration shadowing is turned off for systems setup with same address CIUs while the standby OPC90 is communicating with the CIU, it will command its CIU online resulting in the aforementioned CIU red light condition to occur. The only way to avoid this from happening is to disconnect all OPC clients from OPC90 and command it out of runtime mode of operation before turning off configuration shadowing. If the red light condition does occur, after configuration shadowing is re-enabled, just physically reset the red lit CIU to put it back into operation.

5.3.9.2 OPC Client Access of Redundant Servers

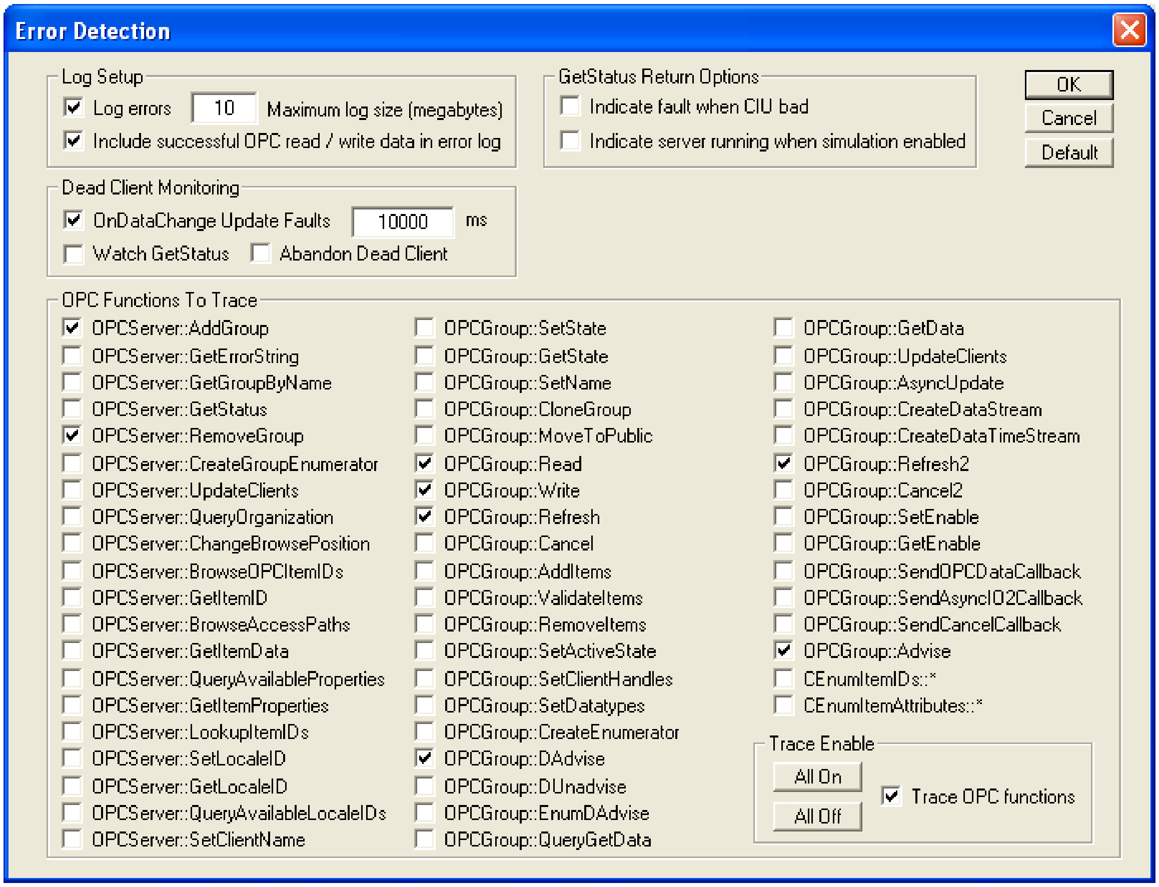
With redundant OPC90 Servers, the OPC client must implement logic to decide which server to access the data from. A common method is to base the decision on two OPC90 data points.

The first is the state of the OPC90 Device block ALL_STATUS tag. When the value of this tag is zero, OPC90 communication with the CIU is valid. The second is to monitor OPC90 server status. OPC clients utilize the OPC GetStatus method to read a server’s status. This function returns several data items regarding the status of the server. One of those items is the server state which can be used to determine if the server is running or faulted due to communication with all the CIU(s) being bad. It returns 1 when running and CIU communication is good otherwise it can be setup to return 2 (fault) when CIU communication is bad. Also, optionally the GetStatus return code can be configured to return RPC_E_FAULT (2,147,549,444) when communication with all CIU(s) is bad.

The settings for the GetStatus server state and return code are configured using the Edit **|** Error Logging dialog.

5.3.10 Error Detection

The error detection logging feature is useful when trying to isolate data exchange problems with OPC client software. The logs are text files viewable by notepad and can be found in the C:\Program Files\OPC90 Server\Log directory. Select “Edit->Error Logs” to configuration the error log options. When this menu item is selected the following dialog is displayed:



Error Detection

Log Setup

☑ Log errors 10 Maximum log size (megabytes)

☑ Include successful OPC read / write data in error log

GetStatus Return Options

□ Indicate fault when CIU bad

□ Indicate server running when simulation enabled

Dead Client Monitoring

☑ OnDataChange Update Faults 10000 ms

□ Watch GetStatus □ Abandon Dead Client

OPC Functions To Trace

☑ OPCServer::AddGroup
□ OPCServer::GetErrorString
□ OPCServer::GetGroupByName
□ OPCServer::GetStatus
☑ OPCServer::RemoveGroup
□ OPCServer::CreateGroupEnumerator
□ OPCServer::UpdateClients
□ OPCServer::QueryOrganization
□ OPCServer::ChangeBrowsePosition
□ OPCServer::BrowseOPCItemIDs
□ OPCServer::GetItemID
□ OPCServer::BrowseAccessPaths
□ OPCServer::GetItemData
□ OPCServer::QueryAvailableProperties
□ OPCServer::GetItemProperties
□ OPCServer::LookupItemIDs
□ OPCServer::SetLocaleID
□ OPCServer::GetLocaleID
□ OPCServer::QueryAvailableLocaleIDs
□ OPCServer::SetClientName
□ OPCGroup::SetState
□ OPCGroup::GetState
□ OPCGroup::SetName
□ OPCGroup::CloneGroup
□ OPCGroup::MoveToPublic
☑ OPCGroup::Read
☑ OPCGroup::Write
☑ OPCGroup::Refresh
□ OPCGroup::Cancel
□ OPCGroup::AddItems
□ OPCGroup::ValidateItems
□ OPCGroup::RemoveItems
□ OPCGroup::SetActiveState
□ OPCGroup::SetClientHandles
□ OPCGroup::SetDatatypes
□ OPCGroup::CreateEnumerator
☑ OPCGroup::DAdvise
□ OPCGroup::DUnadvise
□ OPCGroup::EnumDAdvise
□ OPCGroup::QueryGetData
□ OPCGroup::GetData
□ OPCGroup::UpdateClients
□ OPCGroup::AsyncUpdate
□ OPCGroup::CreateDataStream
□ OPCGroup::CreateDataTimeStream
☑ OPCGroup::Refresh2
□ OPCGroup::Cancel2
□ OPCGroup::SetEnable
□ OPCGroup::GetEnable
□ OPCGroup::SendOPCDataCallback
□ OPCGroup::SendAsyncIO2Callback
□ OPCGroup::SendCancelCallback
☑ OPCGroup::Advise
□ CEnumItemIDs::*
□ CEnumItemAttributes::*

Trace Enable

☑ Trace OPC functions

When the error detection log is enabled, OPC90 logs all errors returned to OPC clients. It will also log all fatal errors encountered such as CIU communication faults. The maximum size of the log file can be set in the range of 1 to 100 megabytes. When the log file reaches the maximum size it is closed and a new one opened. Error logs are automatically deleted when they become older than the number of days configured in the device property. The default setting is 7 days.

The response of the OPC GetStatus function is configurable from this dialog. It can be enabled to return a failed server status when communication with all CIUs is bad. When running in simulation mode the running in test mode status is normally returned. This can be changed to return server running instead should the OPC client(s) have problems with the test mode status.

The returned server status is often used by OPC clients to take corrective actions such as connecting with an alternative OPC server if a faulty status is received. OPC90 returns the following possible statuses.

OPC_STATUS_RUNNING is the normal expected return status. This will be returned even when communication with the DCS is bad unless the “indicate fault when CIU bad” option is enabled. If this option is enabled and CIU communication is completely lost, the return status will indicate failure.

OPC_STATUS_FAILED is returned when the “indicate fault when CIU bad” option is enabled and CIU communication is completely lost.

OPC_STATUS_NOCONFIG is returned when the database has not been setup yet or something is preventing OPC90 from loading its database.

OPC_STATUS_TEST is returned when OPC90 simulation is enabled. This status is an indication the data being received is not live information (its being simulated) and is of a test nature. The “indicate server running when simulation enabled” option can be set to request OPC_STATUS_RUNNING to be returned when simulation is enabled.

Logged messages include the time of the log (millisecond resolution) along with the client number (or name if the client sets its name) for which the error occurred. In addition to OPC errors, successful read and write OPC operations can be included in the log. This is useful for constructing sequence of events between normal operation and when errors occur. Finally, the ability to include OPC function tracing can be enabled for all, or specific functions supported by OPC90. OPC function tracing can be used to log the time when a function is called and the time when it returns to the client. This is a useful feature when trying to track down problems related to DCOM and network communication.

OPC90 includes logic that can attempt to detect dead clients. If an OPC client faults during operation, it obviously can’t perform a graceful disconnect from OPC90 wasting memory resources. The dead client monitoring section can be used to enable two types of dead client detection logic.

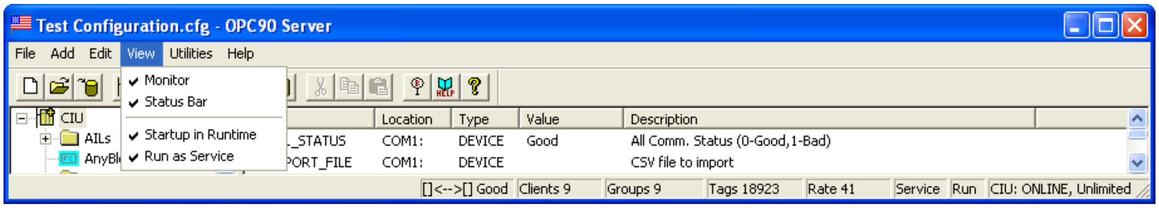
The first is faults that occur when OPC90 tries to send OnDataChange messages to the dead client. Error responses to these updates are an indicator that the client has faulted.

The second is monitoring for the absence of GetStatus messages that clients typically send to servers. Do not set this option if there are a mixture of clients on the same PC running OPC90 and external PCs. It is ok to set if all clients are on the same PC as OPC90 or all clients are on external PCs to the one running OPC90.

Setting “abandon dead client” causes OPC90 to give up memory associated with a declared dead client as detected by either of the two dead client monitoring options.

5.4 View

The view menu option allows selection of monitor mode, status bar, startup in runtime and run as service options. The following picture shows these available View menu items:

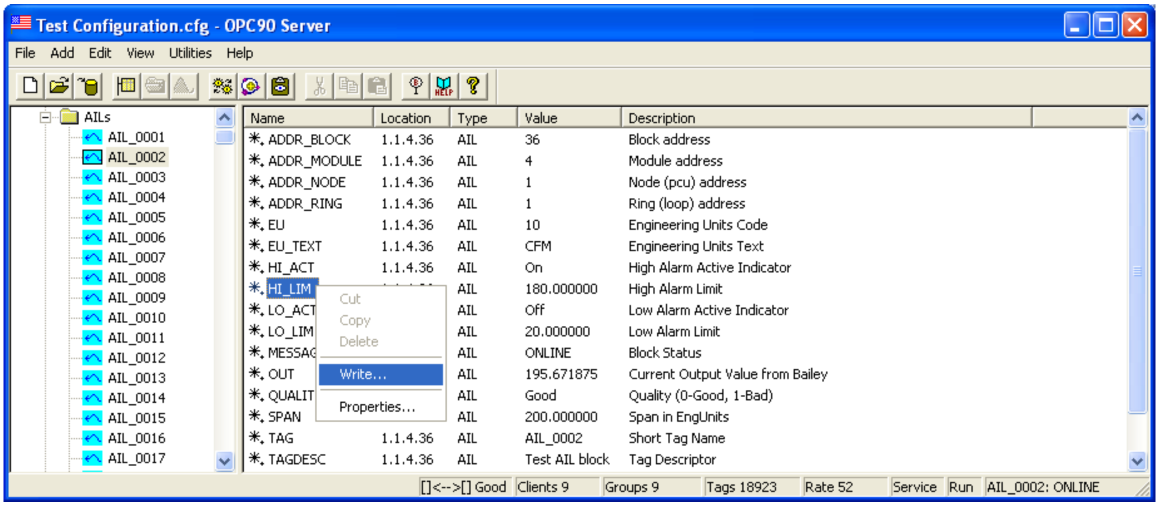


	Location	Type	Value	Description
_STATUS	COM1:	DEVICE	Good	All Comm. Status (0-Good,1-Bad)
PORT_FILE	COM1:	DEVICE		CSV file to import

5.4.1 View Monitor

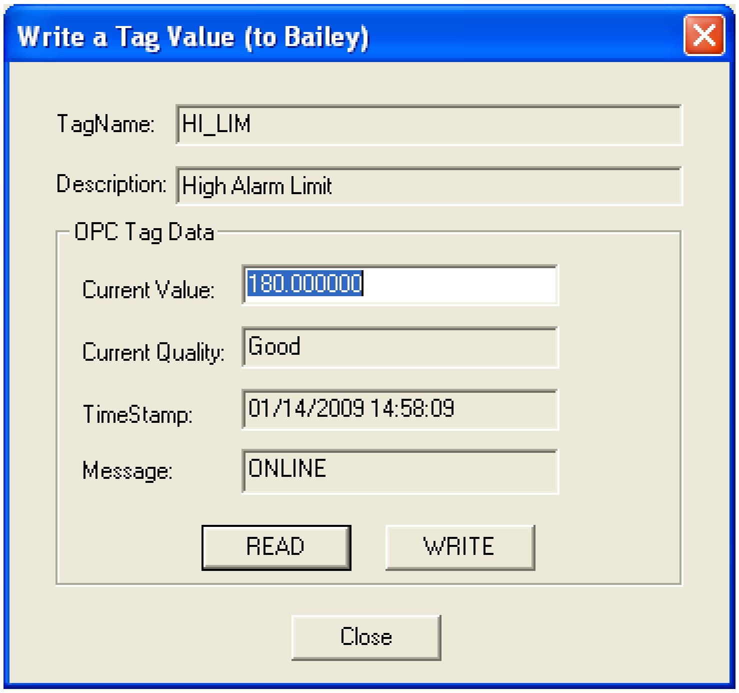
Select “Monitor” to request that OPC90 go into the monitor mode of operation. In this mode the real time values being received from Bailey are displayed in the program window. Monitor mode is useful for instructing OPC90 to begin collecting data from the ABB Bailey system even when no OPC Clients are connected. This feature allows the OPC90 configuration to be validated prior to developing any OPC Client connections.

The following picture shows monitor mode of operation viewing the tag values of a block named AIL_point:



Name	Location	Type	Value	Description
ADDR_BLOCK	1.1.4.36	AIL	36	Block address
ADDR_MODULE	1.1.4.36	AIL	4	Module address
ADDR_NODE	1.1.4.36	AIL	1	Node (pcu) address
ADDR_RING	1.1.4.36	AIL	1	Ring (loop) address
EU	1.1.4.36	AIL	10	Engineering Units Code
EU_TEXT	1.1.4.36	AIL	CFM	Engineering Units Text
HI_ACT	1.1.4.36	AIL	On	High Alarm Active Indicator
HI_LIM		AIL	180.000000	High Alarm Limit
LO_ACT		AIL	Off	Low Alarm Active Indicator
LO_LIM		AIL	20.000000	Low Alarm Limit
MESSAG		AIL	ONLINE	Block Status
OUT		AIL	195.671875	Current Output Value from Bailey
QUALIT		AIL	Good	Quality (0-Good, 1-Bad)
SPAN		AIL	200.000000	Span in EngUnits
TAG	1.1.4.36	AIL	AIL_0002	Short Tag Name
TAGDESC	1.1.4.36	AIL	Test AIL block	Tag Descriptor

Some tag values have write access and can be written from within the OPC90 program window when monitor mode is active. Simply right click on the tag name and select the write option. The following dialog will be displayed:



Write a Tag Value (to Bailey)

TagName: HI_LIM

Description: High Alarm Limit

OPC Tag Data

Current Value: 180.000000

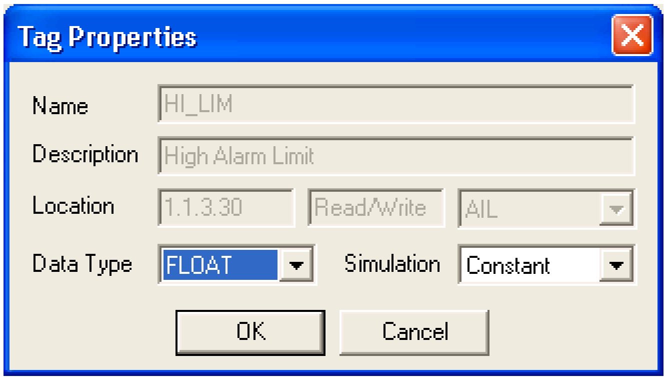
Current Quality: Good

TimeStamp: 01/14/2009 14:58:09

Message: ONLINE

Enter the desired value to be written in the current value field and click on the write button. The entered value will be written.

The tag properties can also be modified. Right click on the tag name and select the properties option. The following dialog will be displayed:



Tag Properties

Name: HI_LIM

Description: High Alarm Limit

Location: 1.1.3.30 | Read/Write | AIL

Data Type: FLOAT

Simulation: Constant

This dialog allows the default native data type representation to be changed. When simulation is enabled, the type of signal to be applied can also be specified. Note that changes to the data type and simulation signal apply globally to all blocks of the same type. In other words if the native type or simulation signal for the OUT tag is changed for the AIL block, the change applies to all AIL blocks.

5.4.2 View Status

Select "Status Bar" to enable and disable the program status bar. When OPC90 is not in runtime mode, the status bar presents tag summary information about the last selected database entity. When in monitor mode it presents the operational state of the selected database entity.

The status bar also presents the state of database shadowing (off, on), current number of attached clients, total groups and tags those clients have setup along with the current OPC data exchange rate for those tags. A field shows if OPC90 is running as a service, process started by a client or the user. The run time state (run / stopped) is also displayed.

5.4.3 View Start In Runtime

Select “Start In Runtime” to enable or disable the mode of operation in which OPC90 automatically starts its communication logic when the program is first executed. This occurs regardless of whether or not any OPC clients are attached to it. Start in runtime is useful when OPC90 is executed automatically as part of a login startup group. It causes the database to be established with the Bailey interface and be made ready for access prior to any OPC client attaching to OPC90. It is most useful for large databases that could take minutes to complete the Bailey interface startup logic. Note that if startup in runtime is enabled and monitor mode enabled and than disabled when there are no outstanding OPC Clients attached to OPC90, the runtime mode of operation is stopped. The program status bar indicates the state of runtime. It indicates “Run” when currently enabled and “Stop” when not currently active.

5.4.4 View Run As Service

Select “Run As Service” to enable or disable OPC90 as a Windows service. A dialog will be displayed confirming whether or not the service should be installed or deleted. Running as a service is only recommended for Windows 2000 / XP systems / 2003 Server systems.

When run as a service is enabled, it is initially setup to log into the local system account. This setting is ideal when OPC90 and the OPC client(s) are intended to run on the same PC and both run within the local system account. If remote OPC client(s) need to access OPC90 running as a service it must be changed to run in a specific account. The same is true if the configuration shadowing feature is to be enabled. Use the Windows service manager to change the OPC90 service to run in that specific account. If using a workgroup, the remote OPC client(s) must also be setup to run within the same account name and password on their respective PC(s).

OPC90 has special logic that allows a second instance of the program to detect the service is running and attaches a user interface to the service. Therefore, allowing it to interact with the desktop is not required. Note that this special logic is only supported for Windows 2000 / XP / 2003 Server.

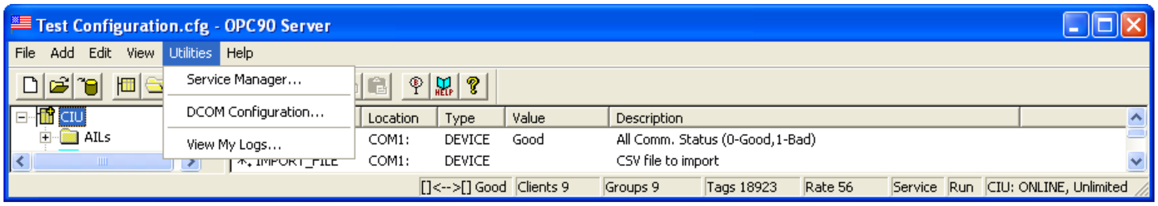
Running OPC90 as a service along with the “Start In Runtime” option is ideal for automatic system startup after a PC reboot. On startup, OPC90 will establish its database with the Bailey system prior to any clients attaching to it reducing the time it takes to gain initial access to database points.

Running OPC90 as a service along with the “Start In Runtime” and “Monitor” option is ideal for automatic system startup after a PC reboot and continuous runtime mode even after all clients detach from the server. On startup, OPC90 will establish its database with the Bailey system prior to any clients attaching to it reducing the time it takes to gain initial access to database points. After a client attaches and detaches, runtime will not be stopped when monitor is still enabled.

Note that it is not absolutely necessary to run OPC90 as a service since OPC by definition automatically starts the server when any client makes a request for its data. Therefore, if problems are encountered with clients attaching to OPC90 running as a service that cannot be resolved by also running the client as a service, or within the same account the OPC90 service is running, then running as a service should be disabled.

5.5 Utilities

The utilities menu option can be used to easily run the Windows service manager or DCOMCNFG program. It can also be used to view OPC90 device and error detection log files. The following picture shows these available View menu items:



	Location	Type	Value	Description
	COM1:	DEVICE	Good	All Comm. Status (0-Good,1-Bad)
IMPORT_FILE	COM1:	DEVICE		CSV file to import

[]<-->[] Good | Clients 9 | Groups 9 | Tags 18923 | Rate 56 | Service | Run | CIU: ONLINE, Unlimited

5.5.1 Service Manager

Selecting the Utilities | Service Manager menu option results in the Windows Service Manager to run. That program allows the OPC90Server service properties to be modified and the service started. The service manager is automatically run by OPC90 when it has been requested to set itself up as a service (see View | Run as Service).

5.5.2 DCOM Configuration

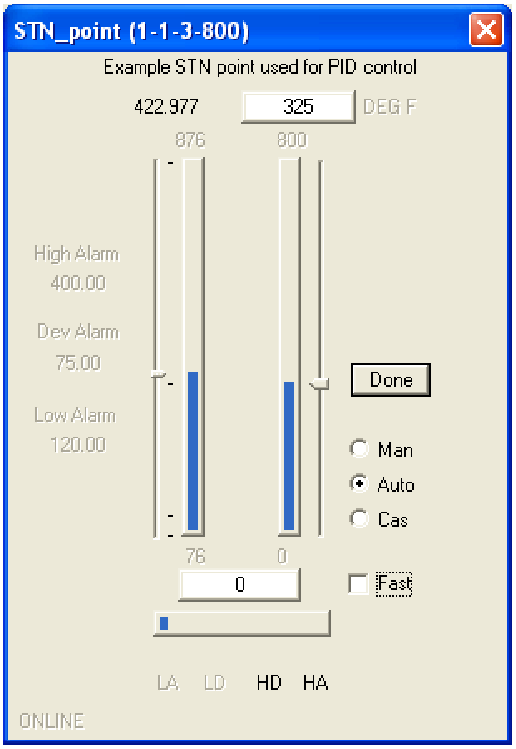
Selecting the Utilities | DCOM Configuration menu option results in the Windows DCOMCNFG program to run. That program allows DCOM to be setup for the computer and OPC90.

5.5.3 View My Logs

Selecting the Utilities | View My Logs menu option displays a file open dialog allowing a specific OPC90 device or error log file to be selected and viewed by opening it in notepad.

5.6 Block Faceplates

Block faceplates are a handy engineering feature that allows real time monitoring and control of any block in the database. These faceplates are available whenever OPC clients are attached to OPC90, the startup in runtime option is enabled or it is in monitor mode. Simply right click on the block and select faceplate. A faceplate dialog will be displayed that corresponds to the block type selected. The following example faceplate corresponds to the STN block type.



STN_point (1-1-3-800)

Example STN point used for PID control

422.977 | 325 DEG F

0

○ Man
● Auto
○ Cas

□ Fast

ONLINE

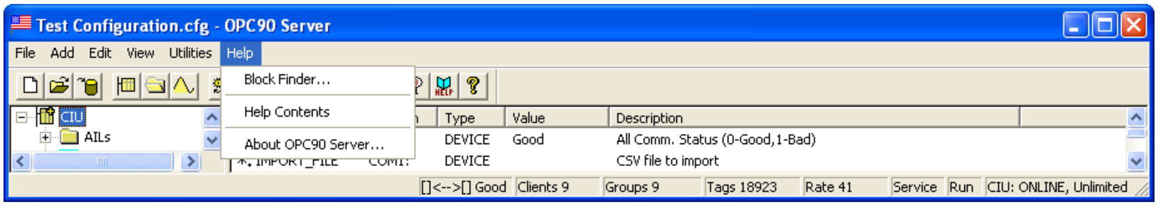
All faceplates have a title which will be the block name followed by the address in ring-node-module-block format. The block description appears immediately under the title. Along the bottom is the block operational status. The remaining indicators and controls that appear will be specific to the block type.

Some faceplates allow numbers to be entered. These types of entries should be completed by pressing the “Tab” key although the “Enter” key also works for all blocks except the Device block. If an entry is not completed within a few seconds, it will revert back to the original setting. Many blocks have alarm and other operational indicators. These indicators are in the inactive state when grey and active when black. For this example, both the high deviation and high alarm is active.

It is important to note that all faceplates have been designed to only utilize OPC tags available from its corresponding block type. This means the faceplates for each block type can serve as a good example on how a faceplate might be implemented in any given OPC client accessing the block data.

5.7 Help

The following picture shows the available Help menu items:



Test Configuration.cfg - OPC90 Server

Type	Value	Description
DEVICE	Good	All Comm. Status (0-Good,1-Bad)
DEVICE		CSV file to import

[]<-->[] Good | Clients 9 | Groups 9 | Tags 18923 | Rate 41 | Service | Run | CIU: ONLINE, Unlimited

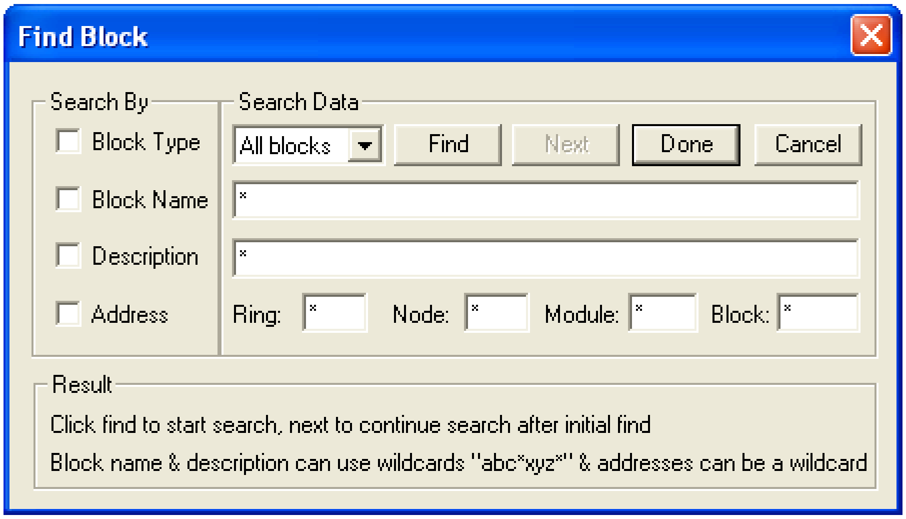
Select “About OPC90 Server” to determine the current program version and licensing information.

Select “Help Contents” to invoke the OPC90 help file.

Select “Block Finder” to easily search the database for specific blocks.

5.7.1 Block Finder

When “Block Finder” is selected the following dialog is displayed. This dialog is used to easily search the database for specific blocks.



Search By:
- □ Block Type — All blocks
- □ Block Name — *
- □ Description — *
- □ Address — Ring: * Node: * Module: * Block: *

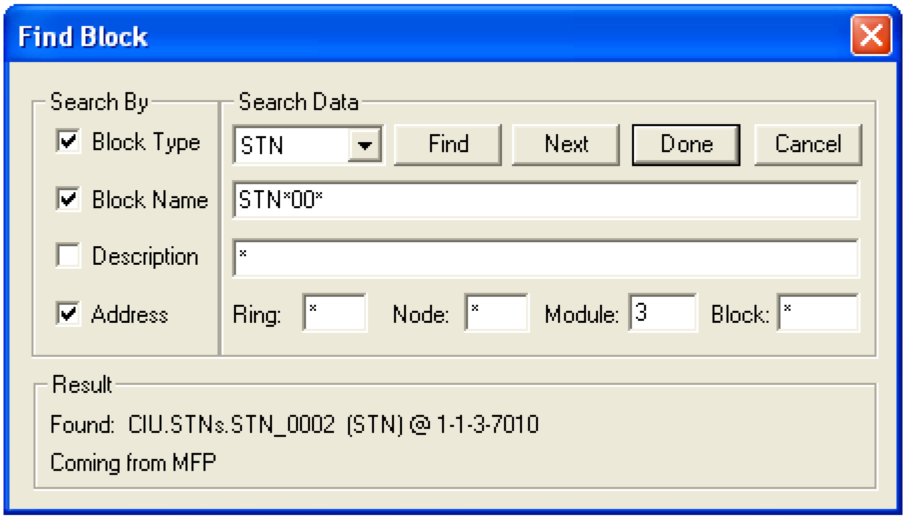
Result:
Click find to start search, next to continue search after initial find
Block name & description can use wildcards "abc*xyz*" & addresses can be a wildcard

A search can be built using the “and” of up to four conditions (block type, block name, description and address). Click on the conditions to be included in the search. Next fill in the search data to be used for each of those conditions. The block type search can be for all block types or a specific block type. Both the block name and description can be for an exact match (not case sensitive) or partial strings using the wildcard character *. The following wildcard combinations are supported.

*substring1
substring1
substring1*
substring1*substring2
substring1*substring2*

The address search condition can also include a wildcard for any of the address fields (ring, node, module and block).

So for example the following setup searches for OPC90 STN blocks with block names starting with “STN” and having “00” in the name one or more characters past “STN” but not at the end of the name. The module address for the OPC90 block must be module 3.



Find Block

Search By

☑ Block Type

☑ Block Name

☐ Description

☑ Address

Search Data

STN

STN*00*

*

Ring: * Node: * Module: 3 Block: *

Result

Found: CIU.STNs.STN_0002 (STN) @ 1-1-3-7010

Coming from MFP

The search starts at the beginning of the database when the find button is clicked. Click the next button to continue the search from the previous block that matched the search condition. When a block is found matching the requested search condition it is shown in the results section. The block name is given prefixed by its full path position. The block type and address is also provided. The block description is beneath the block name. Also the block tree location is automatically selected and opened in the OPC90 main program window.

After searching is complete, exit the dialog by clicking done which saves the search setup data for the next time the searching is invoked. Click on cancel to exit the dialog without saving the search setup data.

6 Groups

There are two different types of OPC Groups to keep in mind. The first is the OPC Server group. This is created within the OPC90 Server configuration and is simply a collection of OPC90 Server Blocks or other groups. An OPC90 Server group can be compared to a directory within a file system. Where in this case the root directory is always an OPC90 DEVICE block. An OPC90 group is only used to store other OPC90 groups or collections of similar OPC90 blocks. No tags exist within an OPC90 group (tags only exist within an OPC90 block). Note that OPC90 supports drag and drop at the group and block level. A block can be moved from one group to another by dragging it to another group and dropping it there. Likewise, dragging an entire group is also supported. All blocks within that group are included in the drag and drop operation. The drag and drop feature is disabled when a second instance of OPC90 is being used as the user interface when running as a service or embedded (started automatically by an OPC client access).

The other group is created by and exists within an OPC Client and is referred to as the OPC Client group. The OPC Client creates this group after it has successfully connected to the OPC90 Server in runtime. The OPC Client group is an interface into the server. After an OPC Client group is created, OPC Tags can then be added to it in runtime. Thus the OPC Client group acts as a collection of tags not blocks. OPC90 Server Address space can be browsed and then OPC90 Server tags selected in runtime. These tags are then placed into the OPC Client group. An OPC Client group does not have to match an OPC90 Server group. When the client disconnects from the server all tags are disestablished and the OPC client group does not exist anymore.

7 Blocks

The following sub-sections define the OPC90 Server blocks available for interfacing with Bailey systems. For ease of access, the blocks are presented in alphabetical order.

It is important to note that a Device Block (DEVICE) ***must*** be configured for the OPC90 Server to successfully communicate with the Bailey system. This block declares an instance of the Bailey driver and its operational characteristics. The remaining OPC90 Server blocks provide access to the various Bailey exception report blocks, polling outputs of non-exception reported blocks, system status, configuration reading and tuning of any Bailey block in the system and the output report block types. Note that the output report block types can only be used with the Bailey NCIU02/03/04, INPCI02 and INICIxx interfaces.

Each OPC90 Server block definition includes a table, which summarizes the attributes and tag names supported by the block type. This table contains four columns which are “Attribute / Tag Name”, “Data Type”, “Access” and “Description”.

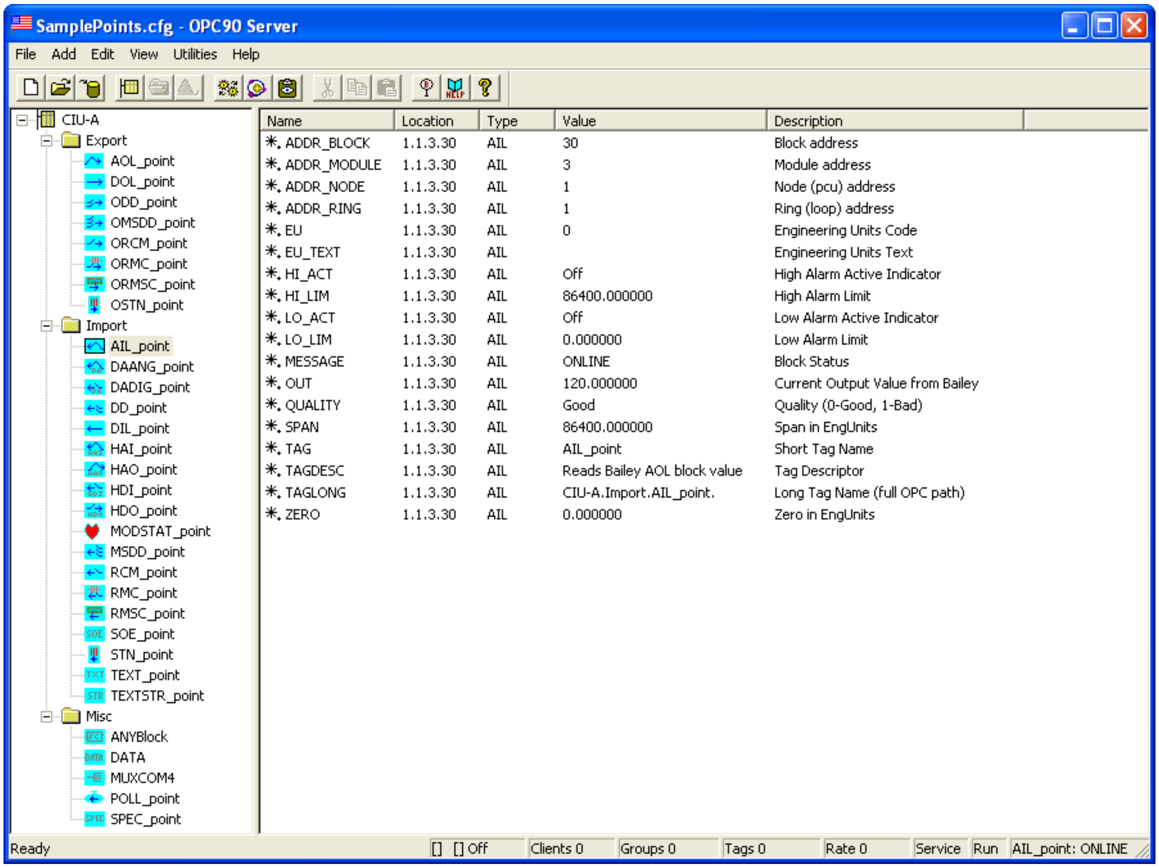
“Attributes” are fields that must be setup as part of defining the block within the OPC90 database. Most of these fields are not available to the OPC Client as an OPC tag. OPC90 supports online changes to some of these attributes via the block properties, available by right clicking on the block and selecting properties. This feature is handy for correcting block address definition problems when OPC90 is currently online providing data to OPC Clients. Note that the block properties dialog is the same one used to configure new blocks (see preceding add block section). Just enter the correct address, and OPC90 will re-establish the point within the ABB Bailey interface. Once the update has been confirmed to correct the addressing problem, don’t forget to save it using the OPC90 File->Save menu selection.

“Tag Names” are fields available to the OPC Client. The “Data Type” column gives the default OPC tag type for each defined tag name.

The “Access” column defines how the OPC Client may use the tag name. A value of “Config/Read” defines the entry as an attribute (attributes are also identified with *italicized* text). A value of “Read/Write” means the OPC Client is expected to provide the value for that tag name. A value of “Read/Write” means the OPC Client can both read and write the value which is also sourced by the Bailey system. For this type of tag access, values received from the OPC Client will be written to Bailey but OPC90 will also look for values received from the Bailey system and write them to the OPC Client via the associated tag name.

The “Description” column gives the purpose for each attribute and tag name.

Included with the OPC90 installation is a sample configuration file called “SamplePoints.cfg”. This file contains examples of all blocks supported and can be viewed by selecting OPC90 File->Open. The following picture presents an example of the sample point configuration:



Name	Location	Type	Value	Description
ADDR_BLOCK	1.1.3.30	AIL	30	Block address
ADDR_MODULE	1.1.3.30	AIL	3	Module address
ADDR_NODE	1.1.3.30	AIL	1	Node (pcu) address
ADDR_RING	1.1.3.30	AIL	1	Ring (loop) address
EU	1.1.3.30	AIL	0	Engineering Units Code
EU_TEXT	1.1.3.30	AIL		Engineering Units Text
HI_ACT	1.1.3.30	AIL	Off	High Alarm Active Indicator
HI_LIM	1.1.3.30	AIL	86400.000000	High Alarm Limit
LO_ACT	1.1.3.30	AIL	Off	Low Alarm Active Indicator
LO_LIM	1.1.3.30	AIL	0.000000	Low Alarm Limit
MESSAGE	1.1.3.30	AIL	ONLINE	Block Status
OUT	1.1.3.30	AIL	120.000000	Current Output Value from Bailey
QUALITY	1.1.3.30	AIL	Good	Quality (0-Good, 1-Bad)
SPAN	1.1.3.30	AIL	86400.000000	Span in EngUnits
TAG	1.1.3.30	AIL	AIL_point	Short Tag Name
TAGDESC	1.1.3.30	AIL	Reads Bailey AOL block value	Tag Descriptor
TAGLONG	1.1.3.30	AIL	CIU-A.Import.AIL_point.	Long Tag Name (full OPC path)
ZERO	1.1.3.30	AIL	0.000000	Zero in EngUnits

This example shows a device called “CIU-A”. Three groups have been configured under this device called “Export”, “Import” and “Misc”. The “Import” group contains sample blocks for receiving exception reported values from the ABB Bailey system. The “Export” group contains sample blocks for responding to the ABB Bailey system as the indicated exception report block. The “Misc” group contains sample blocks for reading / tuning ABB Bailey block configuration information, multiplexing the COM6 port as a CIU port, polling a block output and providing specification information for a particular block.

As noted from this example, the device has a unique symbol ▦ identifying it as a device. Groups are identified with the folder 📁 symbol. Each block type has a unique symbol identifying the functionality of that block. Generally, blocks that import exception reported values are identified with an arrow pointing left (into the device symbol). Blocks that export exception reported values are identified with an arrow pointing right (out from the device symbol). The definition of each block in the following sub-sections includes the symbol associated with that block.

It is **important** to note that the names given to devices, groups and blocks determine the OPC client tag name used to access OPC data. In the above example the OPC client tag name:

“CIU-A.Import.AIL_point.OUT”

will access the output value of the block named AIL_point.

To read and write a set point value of the block named STN_point, the OPC client tag name for the above example would be:

“CIU-A.Import.STN_point.SP”

7.1 Analog Input Loop (AIL)

The AIL OPC90 block is used to retrieve the exception reported output from Bailey Analog Output / Loop (function code 30), Analog Point Definition (function code 70) and Enhanced Analog Point Definition (function code 158) blocks.

Restrictions: This OPC block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
OUT	VT_R4	Read	Current output value from Bailey.
SPAN	VT_R4	Read	Span in Engineering Units.
ZERO	VT_R4	Read	Zero in Engineering Units.
EU	VT_I2	Read	Engineering Units Code.
EU_TEXT	VT_BSTR	Read	Engineering Units String.
HI_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the high alarm condition. Writing a new value to this attribute automatically tunes the alarm limit of the associated Bailey block.
LO_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the low alarm condition. Writing a new value to this attribute automatically tunes the alarm limit of the associated Bailey block.
HI_ACT	VT_BOOL	Read	High alarm active indicator.
LO_ACT	VT_BOOL	Read	Low alarm active indicator.

7.2 Analog Output Loop (AOL)

The AOL OPC90 block is used to send an exception reported output generated by updates to the block input tag (IN). The exception reports can be received by a Bailey console analog tag, Bailey Analog Input / Loop blocks (function code 26) and Analog Input / Infinet blocks (function code 121). Note that this block does not received data from an AOL block (FC 30) running in a Bailey controller. Use the OPC90 AIL block for that purpose. The OPC90 AOL block will automatically generate the appropriate quality, and alarming status based on the value presented at the block input.

Restrictions: This OPC block can be utilized with all Bailey interface types except serial port module (SPM, CPM02 & CPM03) and computer interface command series (CIC).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey CIU ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey CIU node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey CIU module address.
ADDR_BLOCK	VT_I2	Config/Read	Block number to establish this point at within the Bailey interface (see note 1).
INIT_VALUE	VT_R4	Config/Read	Initial startup value
ZERO	VT_R4	Config/Read	Zero of IN/OUT value in engineering units code.
SPAN	VT_R4	Config/Read	Span of IN/OUT value in engineering units code.
SIG_CHANGE	VT_R4	Config/Read	Amount that IN must change, cycle to cycle before it will be reported to Bailey. Expressed as a percentage of the SPAN.
EU_CODE	VT_I2	Config/Read	Bailey engineering units code to use when establishing this point.
MAX_TIME	VT_I4	Config/Read	If IN never changes significantly, it will be reported at the maximum time interval (seconds) defined by this attribute.
HI_LIM	VT_R4	Config/ Read/Write	The setting for the alarm limit used to derive the high alarm condition (see note 2).
LO_LIM	VT_R4	Config/ Read/Write	The setting for the alarm limit used to derive the low alarm condition (see note 2).
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
IN	VT_R4	Read/Write	Input value to be exception reported to Bailey.
QUALITY	VT_BOOL	Read/Write	Current quality (see note 3) of Bailey values (0-good, 1-bad).
OUT	VT_R4	Read	Last input value reported to Bailey.
HI_ACT	VT_BOOL	Read	High alarm active indicator.
LO_ACT	VT_BOOL	Read	Low alarm active indicator.

Notes:

1.) Make sure the block number attribute is unique with respect to the other AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC and OSTN OPC90 blocks associated with the same Bailey Interface Definition block. The block number attribute must also be defined within the range of 1 to maximum number of allowed outputs set up within the associated OPC90 DEVICE Block. The Bailey system will receive data from this block at the ring and node address of the Bailey CIU interface, module two and block number defined by the block attribute.

2.) This attribute is normally configured when the block is first defined. Since it is associated with the alarm limits of value an OPC Client is permitted to write new alarm limits in run time. Care should be taken to not continuously change the limit value since each change necessitates dis-establishing the point from the ABB Bailey interface and than re-establishing it with the new limit value.

3.) When the Device block "Set bad quality of max exception timeout" property is enabled, the QUALITY tag of this block will be set bad if writes to the block input(s) do not occur within the Exception Report Output Max Time setting of the block. When this occurs, bad quality will also be written to the CIU and therefore propagated to the users of the block data within the ABB Bailey system. The quality can also be set bad by writing a one (1) to this tag.

7.3 Block Data (BLK)

The BLK OPC90 block provides Bailey function block configuration capabilities. It supports reading Bailey configuration, tuning specifications, changing module modes, writing new blocks, modifying existing blocks, deleting blocks and saving and restoring module configurations. The BLK block is designed to allow OPC MMI clients to easily set up a Bailey function block programming environment.

Restrictions: None, this OPC90 block can be utilized with all Bailey interface types.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/ Read/Write	Bailey ring address.
ADDR_NODE	VT_I2	Config/ Read/Write	Bailey node address.
ADDR_MODULE	VT_I2	Config/ Read/Write	Bailey module address.
ADDR_BLOCK	VT_I2	Config/ Read/Write	Bailey block address.
MESSAGE	VT_BSTR	Read	Message indicating result of the last configuration related request.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
READ	VT_BOOL	Read/Write	Set to request the specifications for the addressed block to be read. The driver will reset this attribute when the read request is completed.
NEXT	VT_BOOL	Read/Write	Set to request a read of the specifications for the next block from the current one. The driver will reset this attribute when the next block read request is completed and update the BLOCK attribute to reflect the next block read.
TUNE	VT_BOOL	Read/Write	Set to request a tune operation for any specifications that have been changed after reading them. The driver will reset this attribute when the tune read request is completed.
DEFAULT	VT_BOOL	Read/Write	Set to request a read of the default specification settings for the function code indicted by the FC attribute. The driver will reset this attribute when the read default request is completed.
PASSWORD	VT_BSTR	Read/Write	Password to unlock the OPERATION attribute and some commands supported by the COMMAND attribute. Will indicate "????????" when locked and "********" when unlocked.
FILE_TYPE	VT_BOOL	Read/Write	When reset the configuration file type used by the save and load command is the RoviSys OPC90 "C90" file type format. When set the ABB Bailey "CFG" file type format is used.
COMMAND	VT_BSTR	Read/Write	Supports a variety of Bailey controller configuration activities using simple text based commands. See user configuration command

			processing for usage details.
COMMAND_ACT	VT_BOOL	Read	Set when a text based configuration command is active, otherwise reset when command is not active or completed.
OPERATION	VT_I2	Read/Write	Commands Bailey controllers to different operating modes per the following values: 1 = request controller software reset 2 = request configure mode 3 = request execute mode 4 = request configuration initialization The driver will reset this attribute to zero when the module operation request has been completed.
MODE	VT_BSTR	Read	Returns the current operating mode (Execute, Configure, Error) of the module addressed by the ADDR_MODULE attribute.
WRITE	VT_BOOL	Read/Write	Set to request a block to be written or modified. The driver will reset this attribute when the block write or modification request is completed.
DELETE	VT_BOOL	Read/Write	Set to request a block to be deleted. The driver will reset this attribute when the delete block request is completed.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
ACKNAK	VT_I2	Read	Result of the last block configuration activity. A non-zero code indicates an error has occurred.
FC	VT_I2	Read/Write	Function code number returned for the last block read. Also can be written by client when in the process of reading default function code specifications.
FCNAME	VT_BSTR	Read	Function code name returned for the last block read or default specification read.
SX_COUNT	VT_I2	Read	Number of valid specifications for last block Read/Write.
SPEC_FORMAT	VT_I2	Read/Write	Determines how specification description data is to be formatted (see note 1).
S01 to S63	VT_BSTR	Read	Descriptions for specifications 1 through 63.
S01_VALUE to S63_VALUE	VT_R4	Read/Write	Value for specifications 1 through 63.

Notes:

1.) The format of how the specification data is returned can be selected utilizing the SPEC_FORMAT attribute. The following choices are available:

0 - Sx Name Value	Format includes spec number, its name and current value
1 - Name Value	Format includes spec name and its current value
2 - Sx Name	Format includes spec number, and its name
3 - Name	Format includes just the name of the spec

7.3.1 Reading A Bailey Block

To retrieve existing block specification information, the block address must first be written to the ADDR_RING, ADDR_NODE, ADDR_MODULE and ADDR_BLOCK tags of this block. Once the address is written, the READ tag can be set TRUE which instructs OPC90 to retrieve the block specifications. The specification values are copied to the S01_VALUE through S63_VALUE tags. The S01 through S63 tags are also updated with a description of each returned specification. The FC tag will return the block function code number and the FCNAME tag will return the name of the function code. Completion of the read request is signaled when the READ tag is reset to FALSE. The MESSAGE tag will also return a text message indicating completion of the read operation or the reason for failure if the read cannot be completed. When the ACKNAK tag is zero the request was successful, non-zero indicates an error occurred.

Since Bailey function blocks can have up to 63 specifications, tags exist for the maximum number of specifications. The actual number of valid specifications for any given block read can be determined by examining SX_COUNT tag or the descriptions assigned to each specification (S01 through S63 tags). Null descriptors indicate the specification number is not valid for the block read.

7.3.2 Tuning A Bailey Block

Some Bailey specifications can be modified while the block is executing. These are called tunable specifications and are indicated as such by the specification description having the ‘T’ character in front of it. The tags S01_VALUE through S63_VALUE can be used to change the value of tunable specifications. When the TUNE tag is set TRUE, any tunable S01_VALUE through S63_VALUE tag that was changed by the OPC client will be included in the Bailey block tune operation. Completion of the tune operation is flagged when the TUNE tag is reset to FALSE. The MESSAGE tag will also return a text message indicating completion of the tune operation or the reason for failure if the tune cannot be completed. When the ACKNAK tag is zero the request was successful, non-zero indicates an error occurred.

7.3.3 Reading The Entire Bailey Configuration

The entire Bailey configuration can be read using the READ and NEXT tags (also see save command processing). First start by using the ADDR_RING, ADDR_NODE, ADDR_MODULE, ADDR_BLOCK and READ tags to read block zero which is the start of any given module configuration. Each time the NEXT tag is set TRUE, the next block from the last one just read will be retrieved. The returned specification values are copied to the S01_VALUE through S63_VALUE tags. The S01 through S63 tags are also updated with a description of each returned specification. The FC tag will return the block function code number and the FCNAME tag will return the name of the function code. Completion of the next read operation is flagged when the NEXT tag is reset to FALSE. The MESSAGE tag will also return a text message indicating completion of the next read operation or the reason for failure if the next read cannot be completed. When the ACKNAK tag is zero the request was successful, non-zero indicates an error occurred. A search for specific function codes could be implemented by monitoring the FC tag while "stepping" through a Bailey configuration.

7.3.4 Changing Bailey Controller Module Modes

Bailey controller modules are always in one of three operating modes. These modes are execute, configure and error. When in the execute mode the controller runs its block configuration. In this mode of operation, existing blocks can be tuned (see section 7.3.2) but new blocks cannot be added and existing blocks cannot be modified or deleted. When in the configure mode, the controller is not running its block configuration. In this mode of operation, existing blocks can be modified or deleted and new ones can be added. A controller module enters the error mode of operation when it detects a configuration error on transition to the execute mode. A controller can also enter the error mode when a trip block (Bailey Function Code 32) receives a trip signal.

The OPERATION tag can be used to change the current operating mode of any Bailey controller. The MODE tag can be used to monitor the module's current mode of operation. It will return a text message indicating the current operating mode. **WARNING**, changing the operating mode of a controller from execute to configure can cause a plant trip or major outage to occur. For this reason, writing to the OPERATION tag has been placed under password control. When the OPC90 BLK is configured, a case sensitive password is assigned to it. Before OPC90 will accept writes to the OPERATION tag, the OPC Client must first write the correct password to the PASSWORD tag. The PASSWORD tag returns the text "????????" when the password has never been received or the received password is incorrect. The PASSWORD tag returns the text "********" when the correct password has been received. After password validation, writes to OPERATION will cause the currently addressed module (set using the ADDR_RING, ADDR_NODE and ADDR_MODULE tags) to transfer to the requested operating mode. The following OPERATION tag writes are supported:

1 = Request module to perform a software reset
2 = Request module to enter the configure mode of operation
3 = Request module to enter the execute mode of operation
4 = Request module to initialize (clear) its current block configuration

Completion of the requested module operation is flagged when the OPERATION tag is reset to a value of zero (0). The MESSAGE tag will also return a text message indicating completion of the module operation or the reason for failure if the requested operating mode cannot be completed. When the ACKNAK tag is zero the request was successful, non-zero indicates an error occurred. If for example, a request to enter the execute mode actually results in error mode, the MESSAGE tag will display a message indicating why this occurred and the Bailey block that caused the error.

For security, it is highly recommended that once an OPC client has completed its use of the OPERATION tag, it should lock it by sending an invalid password to the PASSWORD tag. Note that OPC90 will automatically invalidate the PASSWORD tag after 60 minutes transpires with no OPC client write activity to the OPC90 BLK block.

7.3.5 Writing Bailey Controller Blocks

To write Bailey function blocks to a controller it must be in the configure mode of operation. See the preceding section to understand how to change Bailey controller modes of operation. There are five easy steps an OPC client must follow to write a Bailey function block. First it writes the function code number of the intended new block to the FC tag. Second it writes the new block number to the ADDR_BLOCK tag. Third it requests the default specification settings for the function code by setting the DEFAULT tag to TRUE. The number of specifications is returned in the SPEC_COUNT tag, the default specification values in the S01_VALUE through S63_VALUE tags and the specification descriptors in the S01 through S63 tags. Completion of the read default request is signaled when the DEFAULT tag is reset to FALSE. The MESSAGE tag will also return a text message indicating completion of the read default operation or the reason for failure if it cannot be completed. When the ACKNAK tag is zero the request was successful, non-zero indicates an error occurred. The fourth step is to change the appropriate specifications from their default values to values that are pertinent to the new block about to be written. This is accomplished by writing to the S01_VALUE through S63_VALUE tags. Note that these tags are always written as floating point values. OPC90 will automatically take care of translating the values to the appropriate types required by the Bailey function block. The fifth and last step is to request OPC90 to actually write the block to the Bailey controller. This is accomplished when the WRITE tag is set TRUE. The value of the S01_VALUE through S63_VALUE tags appropriate for the block function code are translated to the correct data types required for the Bailey function code and the block write occurs. Completion of the write operation is flagged when the WRITE tag is reset to FALSE. The MESSAGE tag will also return a text message indicating completion of the write operation or the reason for failure if the write cannot be completed. When the ACKNAK tag is zero the request was successful, non-zero indicates an error occurred.

7.3.6 Modifying Bailey Controller Blocks

To modify a Bailey function block, the controller must be in the configure mode of operation. See section 7.3.4 to understand how to change Bailey controller modes of operation. There are three easy steps an OPC client must follow to modify a Bailey function block. First it must read the function block to be modified. See section 7.3.1 to understand how to read a block. The second step is to change the appropriate specifications from their current values to the values to be modified. This is accomplished by writing to the S01_VALUE through S63_VALUE tags. Note that these tags are always written as floating point values. OPC90 will automatically take care of translating the values to the appropriate types required by the Bailey function block. The third and last step is to request the block modification by setting the WRITE tag TRUE. The value of the S01_VALUE through S63_VALUE tags appropriate for the block function code are translated to the correct data types required for the Bailey function code and the block modification occurs. Completion of the modification operation is flagged when the WRITE tag is reset to FALSE. The MESSAGE tag will also return a text message indicating completion of the modification operation or the reason for failure if the modification cannot be completed. When the ACKNAK tag is zero the request was successful, non-zero indicates an error occurred.

7.3.7 Deleting Bailey Controller Blocks

To delete a Bailey function block, the controller must be in the configure mode of operation. See section 7.3.4 to understand how to change Bailey controller modes of operation. There are two easy steps an OPC client must follow to delete a Bailey function block. First it must read the function block to be deleted. See section 7.3.1 to understand how to read a block. The second step is to request the block deletion by setting the DELETE tag to a value of TRUE. Completion of the delete is flagged when the DELETE tag is reset to FALSE. The MESSAGE tag will also return a text message indicating completion of the delete operation or the reason for failure if the deletion cannot be completed. When the ACKNAK tag is zero the request was successful, non-zero indicates an error occurred.

7.3.8 Configuration Command Processing

The COMMAND tag allows the client to perform a variety of Bailey configuration related activities using simple text commands. The client sends the text command to the COMMAND tag. It can monitor completion of the requested command using the COMMAND_ACT tag. The MESSAGE tag will contain a text message showing the result of the command when it has finished. The following table presents an overview of the supported commands:

Command	**Arguments**	**Description**
OPERATION	RESET or 1 or CONFIGURE or 2 or EXECUTE or 3 or INITIALIZE or 4 <RING> <NODE> <MODULE>	Changes a Bailey controller mode of operation.
SAVE	<FILE_NAME> <RING> <NODE> <MODULE>	Saves a Bailey controller configuration to a file.
LOAD	<FILE_NAME> <RING> <NODE> <MODULE>	Restores a Bailey controller configuration from a file.
CANCEL	none	Cancels the currently active command.
READ	<BLOCK> <RING> <NODE> <MODULE>	Reads a function block configured in a Bailey controller.
GET	<FUNCTION_CODE> <BLOCK> <RING> <NODE> <MODULE>	Gets the default specifications for a Bailey controller function code.
WRITE	<START_BLOCK> <NUMBER_BLOCKS> <BLOCK_INCREMENT> <RING> <NODE> <MODULE>	Writes a function block to a Bailey controller.
MODIFY	<START_BLOCK> <NUMBER_BLOCKS> <BLOCK_INCREMENT> <RING> <NODE> <MODULE>	Modifies an existing function block within a Bailey controller.
DELETE	<START_BLOCK> <END_BLOCK>	Deletes one or more blocks within

	<RING> <NODE> <MODULE>	a Bailey controller.

The command syntax is simple. The commands and arguments are case insensitive. Each argument must be separated by one or more spaces (not commas). Note that the < > characters are not part of the above arguments. They indicate the argument is optional. If an optional argument is omitted the arguments following it cannot be included in the command.

Note that the italicized commands are under password control. **WARNING**, execution of these commands can cause a plant trip or major outage to occur. They require the correct password to be sent to the PASSWORD tag before the command can be executed. When the OPC90 BLK is configured, a case sensitive password is assigned to it. Before OPC90 will accept protected command writes to the COMMAND tag, the OPC Client must first write the correct password to the PASSWORD tag. The PASSWORD tag returns the text "????????" when the password has never been received or the received password is incorrect. The PASSWORD tag returns the text "********" when the correct password has been received. For security, it is highly recommended that once an OPC client has completed its use of the COMMAND tag, it should lock it by sending an invalid password to the PASSWORD tag. Note that OPC90 will automatically invalidate the PASSWORD tag after 60 minutes transpires with no OPC client write activity to the OPC90 BLK block.

Operation Command

Use this command to change the current operating mode of a controller. See section 7.3.2 entitled "Changing Bailey Controller Module Modes" for a detailed discussion on these modes. The command argument can be the name of the mode or its corresponding mode number. If the address arguments are omitted the current address specified in the ADDR_RING, ADDR_NODE, ADDR_MODULE tags will be used as the destination address for the operation. Following are some example operation commands:

Command	**Action**
OPERATION CONFIGURE	Changes currently addressed module to configure mode.
OPERATION CONFIGURE 1 3 6	Changes ring 1 node 3 module 6 to configure mode.
OPERATION 2	Changes currently addressed module to configure mode.
OPERATION 2 1 3 7	Changes ring 1 node 3 module 7 to configure mode.
OPERATION EXECUTE 1 3 7	Changes ring 1 node 3 module 7 to execute mode.
OPERATION INITIALIZE 1 3 6	Initializes the configuration of ring 1 node 3 module 6.

Save Command

Use this command to save a Bailey module function block configuration to a file. Note that only the function blocks are saved. BASIC programs or C programs with any associated data files are not included in the save. Contact RoviSys if your needs include saving programs. Any file name can be specified. If the filename contains spaces it must be enclosed in double quotes. If the file name is excluded, OPC90 will automatically name the file based on the current address specified in the ADDR_RING, ADDR_NODE and ADDR_MODULE tags. For example assume these tags are currently set to the corresponding values of 1, 2 and 3. The file name will be “00100203.C90” or “10203.CFG”. This convention makes it easy to identify what Bailey module the file corresponds with. OPC90 can save the configuration in one of two file formats. The FILE_TYPE tag selects the file format to utilize. When FILE_TYPE is reset (0), OPC90 will save the Bailey function block configuration data in files that have a “C90” extension. This is the OPC90 file format. When the file name is included in the command, OPC90 will automatically append the “C90” extension if it is missing. Including the “C90” extension in the file name will override the current FILE_TYPE tag setting. The “C90” files are stored in the “ABB” subdirectory unless an alternative directory path is included as part of the file name. When FILE_TYPE is set (1), OPC90 will save the Bailey function block configuration data into files that have a “CFG” extension. These files must already exist and are of the format generated by the ABB Bailey CADEWS software and its derivatives. When the file name is included in the command, OPC90 will automatically append the “CFG” extension if it is missing. Including the “CFG” extension in the file name will override the current FILE_TYPE tag setting. The “CFG” files are also stored in the “ABB” subdirectory unless an alternative directory path is included as part of the file name. If the save command is cancelled or it fails, the file will not be generated and any original file of that name that had been previously saved will remain unchanged. Following are some example save commands:

Command	Action
SAVE	Saves currently addressed module.
SAVE MFP01	Saves currently addressed module to a file called “MFP01.C90”.
SAVE MFP01.CFG	Saves currently addressed module to a file called “MFP01.CFG”.
SAVE DIGESTER 1 3 5	Saves ring 1 node 3 module 5 to a file called “DIGESTER.C90”.

Load Command

Use this command to load a Bailey module function block configuration from a previously saved file. Remember the module must first be in configure mode before it can be loaded with a new configuration. It should also be initialized before loading the new configuration (see OPERATION command). BASIC programs or C programs with any associated data files are not included in the load. Contact RoviSys if your needs include loading of programs. Any file name can be specified. If the file name includes spaces it must be enclosed in double quotes. If the file name is excluded, OPC90 will automatically load a file name based on the current address specified in the ADDR_RING, ADDR_NODE and ADDR_MODULE tags. For example assume these tags are currently set to the corresponding values of 1, 4 and 5. The file name that will be loaded is “00100405.C90” or “10405.CFG”. OPC90 can load the configuration from one of two file formats. The FILE_TYPE tag selects the file format to utilize. When FILE_TYPE is reset (0), OPC90 will load Bailey function block configuration data from files that have a “C90” extension. This is the OPC90 file format. When the file name is included in the command, OPC90 will automatically append the “C90” extension if it is missing. Including the “C90” extension in the file name will override the current FILE_TYPE tag setting. The “C90” files are loaded from the “ABB” subdirectory unless an alternative directory path is included as part of the file name. When FILE_TYPE is set (1), OPC90 will load the Bailey function block configuration data from files that have the "CFG" extension. These files are of the format generated by the ABB Bailey CADEWS software and its derivatives. When the file name is included in the command, OPC90 will automatically append the "CFG" extension if it is missing. Including the "CFG" extension in the file name will override the current FILE_TYPE tag setting. The "CFG" files are loaded from the "ABB" subdirectory unless an alternative directory path is included as part of the file name. Following are some example load commands:

Command	**Action**
LOAD	Load currently addressed module.
LOAD SLC	Load currently addressed module from a file called "SLC.C90".
LOAD SLC.CFG	Load currently addressed module from a file called "SLC.CFG".
LOAD ROLLER 1 4 6	Load ring 1 node 4 module 6 from a file called "ROLLER.C90".

Cancel Command

Use this command to cancel a previously started command. Some commands like SAVE or LOAD might take minutes to complete. The cancel command can be sent to cancel the previously started command.

Command	**Action**
CANCEL	Cancels the previously entered and active command.

Read Command

Use this command to read an existing function block configured in a Bailey module. Following are some example read commands:

Command	**Action**
READ	Read currently addressed function block.
READ 30	Read function block 30 from currently addressed module.
READ 40 1 10 20	Read function block 40 from ring 1 node 10 module 20.

Get Command

Use this command to read default function block data for the any function code supported by a given Bailey module. Note that for some older Bailey modules, the get request must include a block number value that is consistent with the function code number. For example with a Bailey COM module specifying function code 21 for block 0 will return an error because configuring function code 21 at block 0 is illegal. More current modules will return the default data even if the function code could not be configured at the indicated block number. Following are some example get commands:

Command	**Action**
GET	Get default specifications for currently addressed function code, block and address.
GET 80	Get default specifications for function code 80 for current address.
GET 30 1 32 30	Get default specifications for function code 30 for ring 1 node 32 module 30.

Write Command

Use this command to write a new function block to a Bailey module. Remember the module must first be in configure mode before a new block can be written. The steps involved when writing a new function block is to first define it and then write it. First define it by using the READ command to read an existing function block of the same type or using the GET command to read the default settings for the desired function block type. Next change the specification settings by writing to the S01_VALUE through S63_VALUE tags. After the specifications have been changed to the desired values enter this command. Following are some example write commands:

Command	**Action**
WRITE	Write one function block to the currently addressed module.
WRITE 200	Write one function block at block 200 to the currently addressed module.
WRITE 100 10	Starting at block 100 write ten function blocks to the currently addressed module.
WRITE 500 3 6	Starting at block 500 write three function blocks incrementing the written block number by 6 for each write to the currently addressed module. This end result is writing blocks 500, 506 and 512.
WRITE 1000 20 2 1 4 6	Starting at block 1000 write twenty function blocks incrementing the written block number by 2 for each write to ring 1 node 4 module 6.

Modify Command

Use this command to modify an existing function block in a Bailey module. Remember the module must first be in configure mode before a block can be modified. First use the READ command to read the block to be modified. Next change the specification settings by writing to the S01_VALUE through S63_VALUE tags. After the specifications have been changed to the desired new values enter this command. Following are some example modify commands:

Command	**Action**
MODIFY	Modify one function block in the currently addressed module.
MODIFY 300	Modify one function block at block 300 in the currently addressed module.
MODIFY 50 5	Starting at block 50 modify five function blocks in the currently addressed module.
MODIFY 750 4 3	Starting at block 750 modify four function blocks incrementing the modifying block number by 3 for each modification in the currently addressed module. This end result is modifying blocks 750, 753, 756 and 759.
MODIFY 800 10 3 1 10 7	Starting at block 800 modify ten function blocks incrementing the modifying block number by 3 for each modification in ring 1 node 10 module 7.

Delete Command

Use this command to delete one or more existing function blocks configured in a Bailey module. Remember the module must first be in configure mode before blocks can be deleted. Following are some example delete commands:

Command	**Action**

DELETE	Delete currently addressed function block.
DELETE 30	Delete function block 30 from currently addressed module.
DELETE 30 40	Delete function blocks 30 through 40 from currently addressed module.
DELETE 100 120 1 10 20	Delete function blocks 100 through 120 from ring 1 node 10 module 20.

7.3.9 ABB Bailey Controller Configuration Faceplate

The BLK block includes a faceplate that allows the user to configure ABB Bailey controller logic. It incorporates many of the features found in the Bailey TXTEWS and CLS programs. To display the faceplate, right click on the BLK block and select “Faceplate”. The following faceplate will be displayed:

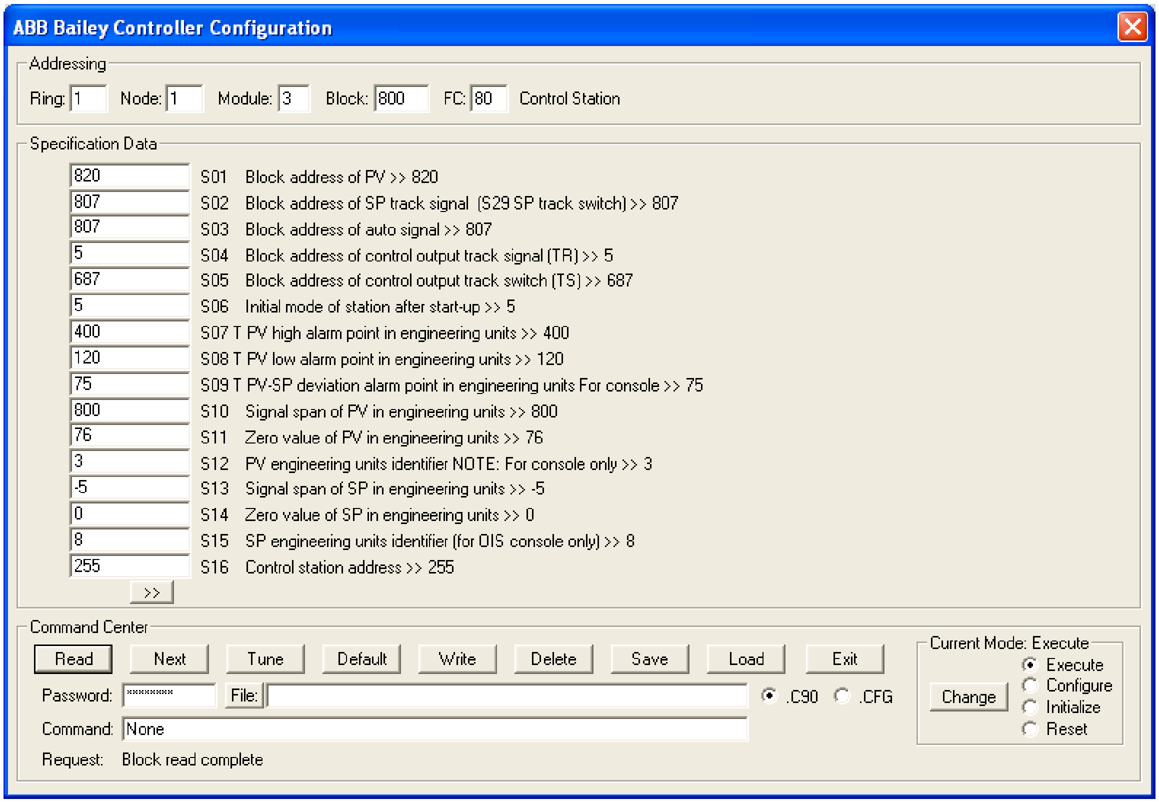


ABB Bailey Controller Configuration

Addressing

Ring: 1 Node: 1 Module: 3 Block: 800 FC: 80 Control Station

Specification Data

820	S01	Block address of PV >> 820
807	S02	Block address of SP track signal (S29 SP track switch) >> 807
807	S03	Block address of auto signal >> 807
5	S04	Block address of control output track signal (TR) >> 5
687	S05	Block address of control output track switch (TS) >> 687
5	S06	Initial mode of station after start-up >> 5
400	S07 T	PV high alarm point in engineering units >> 400
120	S08 T	PV low alarm point in engineering units >> 120
75	S09 T	PV-SP deviation alarm point in engineering units For console >> 75
800	S10	Signal span of PV in engineering units >> 800
76	S11	Zero value of PV in engineering units >> 76
3	S12	PV engineering units identifier NOTE: For console only >> 3
-5	S13	Signal span of SP in engineering units >> -5
0	S14	Zero value of SP in engineering units >> 0
8	S15	SP engineering units identifier (for OIS console only) >> 8
255	S16	Control station address >> 255

Command Center

Password: ******** File: ● .C90 ○ .CFG

Command: None

Request: Block read complete

Current Mode: Execute

● Execute
○ Configure
○ Initialize
○ Reset

WARNING, incorrect use of this faceplate can cause a plant trip or major outage to occur. Make sure you understand ABB Bailey configuration principles and are aware of the current plant operating conditions before using some features of this faceplate.

The faceplate contains three major sections. The boxes with white background indicate possible user input areas, based on a particular configuration activity.

The first section is “Addressing”. This section is used to specify the address of an ABB Bailey module to be configured. The example shows configuration data for a Station (Function Code 80) read from Ring 1, Node 1, Module 3 and Block 800.

The second section is “Specification Data”. This section displays the current specification values and associated descriptions. Tunable specifications are indicated with a “T” following the specification number. Also notice the description includes the current specification value. This is useful when tuning or modifying an existing function block. As a new specification value is typed, the current value is still visible as part of the description. Pressing the <Enter> key will abandon entry of a specification value and reset it back to its original value. Otherwise, it will be updated to the new value after the tune or block write is requested. This section can display up to 16 specifications at a time. For function blocks with more than sixteen specifications, click on the forward and backward (not shown in example) arrow buttons to scroll to the next set of sixteen block specifications.

The last section is “Command Center”. This section is used to request the various configuration activities. Some configuration activities are under password control. The “Password” area is used to enter the password assigned to the BLK block. It displays “????????” to indicate the password has not been entered and “********” when it has. The “Command” area allows expert users to bypass the button commands. See the preceding section entitled “Configuration Command Processing” for details on what commands can be entered. Most users will use the button commands described by the following table.

BUTTON	Description
READ	Enter the address of a block in the addressing section and click on this button to read the function block data.
NEXT	Click on this button to read the next function block data from the currently addressed block.
TUNE	Enter new tunable specification values in the specification data section and click on this button to tune those values within the ABB Bailey controller. Note the module must be “Execute” mode when tuning blocks.
DEFAULT	Enter a function code number in the addressing section and click on this button to retrieve the default specification settings for that function code.
WRITE	Enter the desired specification settings for the function block in the specification data section and click on this button to write the function block data to the ABB Bailey controller. If the block already exists, it will be modified. Note the module must be in “Configure” mode when writing blocks.
DELETE	Enter the address of a block in the addressing section and click on this button to delete it from the ABB Bailey controller. Note the module must be in “Configure” mode to delete blocks.
SAVE	Click on this button to save the currently addressed module. If no file name is entered in the “File” area, the file name will automatically be based on the current ring, node and module address. For the above example it will be “00100103.C90”. If the “CFG” radio button is selected it will be “10103.CFG” (to match Bailey CADEWS naming syntax). This convention makes it easy to identify what Bailey module the file corresponds with. Configuration data can be saved in one of two file formats. The format is selected with the “C90” and “CFG” radio buttons. When the “C90” radio button is selected, the function block configuration data is saved into files that have a “C90” extension. This is the OPC90 file format. The “C90” files are stored in the “ABB” subdirectory unless an alternative directory path is included as part of a user inputted file name. When the “CFG” radio button is selected, the function block data is saved into files that have a “CFG” extension. These files must

	already exist and are of the format generated by the ABB Bailey CADEWS software and its derivatives. The "CFG" files are also stored in the "ABB" subdirectory unless an alternative directory path is included as part of a user inputted file name. Click on the STOP button to stop the file save operation. If the save command is stopped or it fails, the file will not be generated and any original file of that name remains unchanged. Note that if a user inputted file name or directory path is entered that contains spaces, it must be enclosed within quotes ("C:\Program Files\OPC90 Server\ABB\Name With Spaces"). When a user file name is entered it is not necessary to include its extension. The default extension selected by the "C90 / CFG" radio button will automatically be appended to the file. Including the "C90" or "CFG" file extension overrides the default type.
LOAD	Click on this button to load the currently addressed module. If no file name is entered in the "File" area, the file name will automatically be based on the current ring, node and module address. For the above example it will be "00100103.C90". If the "CFG" radio button is selected it will be "10103.CFG" (to match Bailey CADEWS naming syntax). This convention makes it easy to identify what Bailey module the file corresponds with. Configuration data can be loaded from one of two file formats. The format is selected with the "C90" and "CFG" radio buttons. When the "C90" radio button is selected, the function block configuration data is loaded from files that have a "C90" extension. This is the OPC90 file format. The "C90" files are found in the "ABB" subdirectory unless an alternative directory path is included as part of a user inputted file name. When the "CFG" radio button is selected, the function block data is loaded from files that have a "CFG" extension. These files must already exist and are of the format generated by the ABB Bailey CADEWS software and its derivatives. The "CFG" files are also found in the "ABB" subdirectory unless an alternative directory path is included as part of a user inputted file name. Click on the STOP button to stop the load operation. Note that if a user inputted file name or directory path is entered that contains spaces, it must be enclosed within quotes ("C:\Program Files\OPC90 Server\ABB\Name With Spaces"). When a user file name is entered it is not necessary to include its extension. The default extension selected by the "C90 / CFG" radio button will automatically be appended to the file. Including the "C90" or "CFG" file extension overrides the default type.
CHANGE	Click on this button to change the operating mode of the currently addressed module to the mode indicated by the radio buttons. The current operating mode of the module is displayed below the mode selection radio buttons.
FILE	Click on this button to open a configuration file open dialog that allows selection of existing .C90 or .CFG files stored in the "C:\Program Files\OPC90 Server\ABB" directory.

7.4 Data Acquisition Analog (DAANG)

The DAANG OPC90 block is used to retrieve the exception reported output from Bailey Data Acquisition Analog blocks (function code 177).

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
COMMAND	VT_I2	Read/Write	Command attribute to request Bailey DAANG block as follows (only valid when mode is Auto): 0-Use Auto Input 1-Use Calculated Input 2-Suppress Alarms 3-Un-suppress Alarms 4-Turn Scan Off 5-Turn Scan On
ALARM_CTRL	VT_R4	Read/Write	Alarm control (see FC 177, S20).
SIG_CHANGE	VT_R4	Read/Write	Significant change to force an exception report (see FC 177, S30).
TBA_PERIOD	VT_R4	Read/Write	Time based alarm period (see FC 177, S31).
HI_RATE	VT_R4	Read/Write	High rate of change value (see FC 177, S32).
LO_RATE	VT_R4	Read/Write	Low rate of change value (see FC 177, S33).
TSA_COUNT	VT_R4	Read/Write	Time sequence alarm count (see FC 177, S34).
OUT_HI_LIM	VT_R4	Read	OUT high limit.
OUT_LO_LIM	VT_R4	Read	OUT low limit.
OUT	VT_R4	Read/Write	Current output value received from Bailey.
EU	VT_I2	Read	Engineering Units Code.
EU_TEXT	VT_BSTR	Read	Engineering Units String.
MODE	VT_I2	Read/Write	The mode of the Bailey block. 0 - Manual 1 - Auto
RED_CMD	VT_BSTR	Read/Write	Red tag command (see red tag users section).
RED_TAG	VT_BOOL	Read	Red tag indicator (0 – no, 1 – yes).
RED_USERS	VT_BSTR	Read	Red tag users (current user names or codes).
HI_HI_HI_ACT	VT_BOOL	Read	High high high alarm active indicator.
HI_HI_ACT	VT_BOOL	Read	High high alarm active indicator.
HI_ACT	VT_BOOL	Read	High alarm active indicator.
HI_RATE_ACT	VT_BOOL	Read	High alarm rate active indicator.
LO_RATE_ACT	VT_BOOL	Read	Low alarm rate active indicator.
LO_ACT	VT_BOOL	Read	Low alarm active indicator.
LO_LO_ACT	VT_BOOL	Read	Low low alarm active indicator.
LO_LO_LO_ACT	VT_BOOL	Read	Low low low alarm active indicator.
DVLIM	VT_R4	Read/Write	Deviation alarm limit.

DV_HI_ACT	VT_BOOL	Read	Deviation high alarm active indicator.
DV_LO_ACT	VT_BOOL	Read	Deviation low alarm active indicator.
HI_HYS	VT_R4	Read/Write	The amount the alarm value must lower below the current high alarm level limit before the associated active current alarm condition clears.
HI_HI_HI_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the high high high alarm condition.
HI_HI_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the high high alarm condition.
HI_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the high alarm condition.
LO_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the low alarm condition.
LO_LO_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the low low alarm condition.
LO_LO_LO_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the low low low alarm condition.
LO_HYS	VT_R4	Read/Write	The amount the alarm value must raise above the current low alarm level limit before the associated active current alarm condition clears.
NEXT_HI	VT_R4	Read	Next high alarm limit to be reached.
NEXT_LO	VT_R4	Read	Next low alarm limit to be reached.
LIMITED	VT_BOOL	Read	Value is limited indicator.
CALC	VT_BOOL	Read	Using calculated input indicator.
OUT_RANGE	VT_BOOL	Read	Out of range detected indicator.
SCAN_OFF	VT_BOOL	Read	Scan disabled indicator.
RATE_ACT	VT_BOOL	Read	Rate alarm indicator.
SUP_ACT	VT_BOOL	Read	Suppress alarm indicator.
VAR_ACT	VT_BOOL	Read	Variable alarm indicator.
HW_FAIL_IND	VT_BOOL	Read	Hardware Failure indicator.
HI_REF	VT_R4	Read	High display reference value (DAANG S1).
MID_REF	VT_R4	Read	Middle display reference value (DAANG S2).
LO_REF	VT_R4	Read	Low display reference value (DAANG S3).
HI_CONST	VT_R4	Read	High constraint limit (DAANG S4).
LO_CONST	VT_R4	Read	Low constraint limit (DAANG S5).

7.5 Data Acquisition Digital (DADIG)

The DADIG OPC90 block is used to retrieve the exception reported output from Bailey Data Acquisition Digital blocks (function code 211).

Restrictions: This OPC90 block cannot be used with NETWORK 90 interfaces. It is valid for all INFI 90 interface types.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
OUTLSD0	VT_BSTR	Config/Read	Output state zero logic state descriptor.
OUTLSD1	VT_BSTR	Config/Read	Output state one logic state descriptor.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
FACE_TYPE	VT_I2	Read	Faceplate type (value of DADIG block S17).
ALARM	VT_BOOL	Read	Alarm active indicator.
ALARM_TOGGLE	VT_BOOL	Read	Return alarm toggle indicator.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
COMMAND	VT_I2	Read/Write	Bailey DADIG block control as follows (note 1): 0-Reset custom input, 1-Set custom input, 2-Select custom input, 3-Select primary input, 4-Select alternate input, 5-Enable alarm suppression, 6-Disable alarm suppression, 7-Clear alarm latch, 8-Disable exception reports from this block, 9-Enable exception reports from this block, 10-Force an exception report from this block.
IN_CTRL	VT_R4	Read/Write	Input conditioning mode control (see FC 211, S6).
IN_TREF	VT_R4	Read/Write	Input conditioning time reference, seconds (see FC 211, S7).
IN_CREF	VT_R4	Read/Write	Input conditioning digital filter count reference (see FC 211, S8).
ALARM_CTRL	VT_R4	Read/Write	Alarm mode control (see FC 211, S9).
ALARM_TREF	VT_R4	Read/Write	Alarm time reference, seconds (see FC 211, S10).
ALARM_TCOUNT	VT_R4	Read/Write	Alarm digital filter transition count reference (see FC 211, S11).
RTP_REF	VT_R4	Read/Write	Return alarm/de-alarm time period reference (see FC 211, S12).
OUT	VT_BOOL	Read	Bailey discrete output value.
OUT_TEXT	VT_BSTR	Read	Bailey discrete output value as a string.
OVR_STATUS	VT_BOOL	Read	Status override indicator.
SUSPECT	VT_BOOL	Read	Alarm suspect indicator.
E_STOP	VT_BOOL	Read	Emergency stop indicator.

IN_SELECT	VT_BOOL	Read	Input is selectable indicator (note 2).
IN_ALTERNATE	VT_BOOL	Read/Write	Alternate input active indicator / request (note 2).
IN_CUSTOM	VT_BOOL	Read/Write	Custom input active indicator / request (note 2).
IN_PRIMARY	VT_BOOL	Read/Write	Primary input active indicator / request (note 2).
LATCH	VT_BOOL	Read/Write	Alarm latch indicator / reset request (note 3).
SUPPRESS	VT_BOOL	Read/Write	Alarm suppress indicator / set / reset (note 4).
XRP_OFF	VT_BOOL	Read/Write	Exception report off indicator / set / reset / request (note 5).

Notes:

1.) The COMMAND attribute can be used to send various commands to the Bailey DADIG block. Specifically, it allows selection of the CUSTOM input state, what input should currently be used, control of alarm suppression, resetting the alarm latch and control of exception reporting. Note that writing to the attributes that report the current state of that block feature can also control these features (notes 2 – 5).

2.) When the IN_SELECT attribute is TRUE (1), the DADIG block can be commanded to use its various inputs. The IN_ALTERNATE, IN_CUSTOM and IN_PRIMARY attributes indicate the current input being used by the block. They can also be used to command the block to use a different input. For example assume the current input is primary, then IN_PRIMARY will be one, IN_ALTERNATE and IN_CUSTOM will be zero. When a one is written to IN_ALTERNATE, the DADIG block will begin using the alternate input. Note that writes will be rejected if the IN_SELECT attribute is not TRUE (1).

3.) The DADIG block alarm latch is indicated by this attribute. By writing FALSE (0) to this attribute, the latch will be cleared.

4.) This attribute indicates alarm suppression is in effect. It can also be used to set or reset alarm suppression (only if enabled by the DADIG block configuration) by writing a respective TRUE (1) or FALSE (0) to this attribute.

5.) This attribute indicates whether or not exception reporting for this block has been disabled. If XRP_OFF is TRUE (1), exception reporting is disabled. This attribute can be used to turn exception reporting off or on. Write TRUE (1) to it to turn exception reporting off. Write FALSE (0) to it to enable exception reporting. When exception reporting is off and TRUE (1) is written to this attribute, an exception report force command will be sent. This message causes the block to exception report once but still leave exception reporting off.

7.6 Data Block (DATA)

The purpose of the OPC90 DATA block is to enable OPC clients to communicate information with each other through values they read / write to the various tags supported by this block. The DATA block supports VT_BOOL, VT_I1, VT_I2, VT_I4, VT_UI1, VT_UI2, VT_UI4, VT_R4, VT_R8 and VT_BSTR tag values. It also includes a general purpose high resolution timer function and Boolean swap state timer function. The high resolution timer units can be setup for seconds, minutes, hours or days. It can also be setup as an up or down timer that automatically restarts or must be manually restarted. The Boolean swap state timer flops its value between true and false at the specified period (seconds). All of these timer functions are controllable from client accessible OPC tags. Whenever the database is saved, the current OPC client timer settings are included in the saved data and will be restored when OPC90 is restarted.

Restrictions: This OPC90 block counts against the total block license but does not consume any space or bandwidth within the Bailey interface.

TAGNAME	TYPE	ACCESS	DESCRIPTION
BOOL	VT_BOOL	Read/Write	Boolean, VT_BOOL (0 = false, not zero = true).
BSTR	VT_BSTR	Read/Write	String, VT_BSTR.
I1	VT_I1	Read/Write	Signed I1, VT_I1 (-128 to 127).
I2	VT_I2	Read/Write	Signed I2, VT_I2 (-32,768 to 32,767).
I4	VT_I4	Read/Write	Signed I4, VT_I4 (-2,147,483,648 to 2,147,483,647).
UI1	VT_UI1	Read/Write	Unsigned I1, VT_UI1 (0 to 255).
UI2	VT_UI2	Read/Write	Unsigned I2, VT_UI2 (0 to 65,535).
UI4	VT_UI4	Read/Write	Unsigned I4, VT_UI4 (0 to 4,294,967,295).
R4	VT_R4	Read/Write	Real 4, VT_R4.
R8	VT_R8	Read/Write	Real 8, VT_R8.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
TIMER	VT_R8	Read/Write	Running timer (in units setup by TIMER_CTRL).
TIMER_CTRL	VT_UI1	Read/Write	Timer control (+0 secs, +1 mins, +2 hours, +3 days, +4 auto reset, +8 down timer).
TIMER_ALARM	VT_BOOL	Read	Timer alarm indicator (true = timed out).
TIMER_LIMIT	VT_R8	Read/Write	Timer limit.
SWAP	VT_BOOL	Read/Write	Swaps state between true / false.
SWAP_TIME	VT_R8	Read/Write	Time between each state swap (seconds).

7.7 Device Driver (DD)

The DD OPC90 block is used to retrieve and control the exception reported output from Bailey Device Driver blocks (function code 123).

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
F1LSD0	VT_BSTR	Config/Read	Feedback 1 state zero logic state descriptor.
F1LSD1	VT_BSTR	Config/Read	Feedback 1 state one logic state descriptor.
F2LSD0	VT_BSTR	Config/Read	Feedback 2 state zero logic state descriptor.
F2LSD1	VT_BSTR	Config/Read	Feedback 2 state one logic state descriptor.
OUTLSD0	VT_BSTR	Config/Read	Output state zero logic state descriptor.
OUTLSD1	VT_BSTR	Config/Read	Output state one logic state descriptor.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
FACE_TYPE	VT_I2	Read	Faceplate type (value of DD block S10).
DISC_ACT	VT_BOOL	Read	Alarm active indicator.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
OUT	VT_BOOL	Read/Write	Bailey discrete output value.
OUT_TEXT	VT_BSTR	Read/Write	Bailey discrete output value as a string (see note 1).
MODE	VT_I2	Read/Write	The mode of the Bailey block. 0 - Manual 1- Auto
MODE_LOCK	VT_BOOL	Read	Indicates mode is locked in auto (0-no, 1-yes).
RED_CMD	VT_BSTR	Read/Write	Red tag command (see red tag users section).
RED_TAG	VT_BOOL	Read	Red tag indicator (0 – no, 1 – yes).
RED_USERS	VT_BSTR	Read	Red tag users (current user names or codes).
F1	VT_BOOL	Read	State of feedback number 1.
F1_TEXT	VT_BSTR	Read	State of feedback number 1 as a string.
F2	VT_BOOL	Read	State of feedback number 2.
F2_TEXT	VT_BSTR	Read	State of feedback number 2 as a string.
BAD_FEEDBACK	VT_BOOL	Read	Feedback bad indicator.
OVR_STATUS	VT_BOOL	Read	Override status indicator.

Notes:

1.) Text strings can be written to this tag to control the DD output. Valid text strings are the OUTLSD0 and OUTLSD1 settings along with “0”, “1”, “Off”, “On”, “Reset”, “Set”, “Zero”, “One”, “False” and “True”. Writing any of these strings is case insensitive.

7.8 Device Definition Block (DEVICE)

The DEVICE Definition OPC90 block is used to declare an instance of the Bailey driver and define its interfacing data. This block must be defined for each Bailey interface or redundant pair of interfaces that the OPC90 Server is to communicate with. The DEVICE block has a number of tags used to monitor driver communication health and statistics. Italicized names indicate attributes configured within the OPC90 Server, which cannot be connected to via OPC. These attributes are the device properties. Device properties are configured when the block is first added. They are also be changed by "right clicking" on the device block and selecting properties.

ATTRIBUTE/ **TAGNAME**	**TYPE**	**ACCESS**	**DESCRIPTION**
SCHEME	8 Bit UINT	Config	Desired communication scheme (see note 1): Single interface, Single interface redundant channels, Dual interfaces.
Primary Port	String	Config	Name of the COM or SCSI (see SCSI communication sub-section) port attached to the primary interface channel.
Secondary Port	String	Config	Name of the COM or SCSI (see SCSI communication sub-section) port attached to the secondary interface channel. Note that this attribute is ignored if the SCHEME attribute is set to single interface.
MAX OUTPUTS	16 Bit UINT	Config	Maximum number of output blocks (AOLs, DOLs, ODDs, OMSDD, ORCMs, ORMCs, ORMSCs and OSTNs) the driver should reserve point indices (block numbers) for within the Bailey interface device. It is important to note that these indices are specified as part of the AOLs, DOLs, ODDs, OMSDD, ORCMs, ORMCs, ORMSCs and OSTNs block definition and must always fall in the range of one to the maximum outputs defined by this attribute.
WATCHDOG	8 Bit UINT	Config	Desired watchdog timer to be initiated between the driver and Bailey interface device. The timer is expressed in 2.5 second counts. A value of zero disables the watchdog timer. The maximum value is 255 which is equivalent to 637.5 seconds. When the watchdog timer is enabled, the Bailey interface device will remove itself from the communication loop if the elapsed time in which the driver communicates with it exceeds the watchdog timer value. Driver output block values (AOLs, DOLs, ODDs, OMSDD, ORCMs, ORMCs, ORMSCs and OSTNs) being received by Bailey controllers will thereafter automatically be marked as bad quality by the Bailey system.
INPUT XRP UPDATE	32 Bit UINT	Config	Frequency in milliseconds at which exception report availability is read from the Bailey interface device. Settings in the range of 500 to 3000 milliseconds are common.

OUTPUT XRP UPDATE	32 Bit UINT	Config	Frequency in milliseconds at which output exception reports are written to the Bailey interface device. Output exception reports are values written to AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC and OSTN blocks by OPC clients. Settings in the range of 500 to 3000 milliseconds are common.
MIN SPEC UPDATE RATE	32 Bit UINT	Config	Minimum update rate in milliseconds at which STN and SPEC block specifications will be read. A value equal to the larger of this setting or the total number of STN and SPEC blocks in the database times 1000 is actually used by the server.
LOCK	Boolean	Config	Supervisory control write lock. When True (1), locks out all operator write requests (supervisory control write) from the other OPC90 Server blocks that support write capability.
ESTABLISH ONLINE	Boolean	Config	Commands interface on-line before establishing the points. Use this option for heavily loaded Network 90 systems. It only needs to be enabled when PCUs are observed to toggle between the online and offline state when OPC90 Server is starting.
SCREENING	Boolean	Config	Utilize the interface exception report screening option. This option helps increase throughput by instructing the interface to not report unchanged exception reports received from the sender as a result of its maximum exception report time limit expiring.
ENHANCED ANALOG PRECISION	Boolean	Config	Enables analog data exchange with AIL and AOL blocks using REAL4 representation instead of REAL3. REAL4 representation increases the accuracy of analog values to 7 digits. REAL3 values have an accuracy of 5 digits. Enabling this option is only valid for INFI90 systems. It is ignored when the detected system type is NETWORK 90 or Command Series. This option adds an extra byte to each analog value exchanged with the CIU. The result is a very slight reduction in the maximum number of exception reports that can be exchanged per second. Most users should enable this option. It has been made optional to maintain compatibility with existing OPC90 installations.
MSDD PULSE OUT HANDLING	Boolean	Config	Enables additional logic that handles MSDD blocks configured for pulsed output operation. The MSDD pulse output time specification (S22) is read on startup. If non-zero, whenever changes to the requested state are made, the OPC90 MSDD block REQ_STATE tag will be reset to zero after the configured pulse output time has transpired. Remember, any changes made to MSDD block pulse output times after startup of OPC90 are not recognized until OPC90 is restarted.
TIME SYNCING	Boolean	Config	Supports defining the type of ABB Bailey system and time syncing related options (see note 2).
STN FAST Update	32 Bit	Config	Defines the fast update interval in minutes and poll

	UINT		rate in milliseconds for all STN blocks belonging to this device. When a STN.K* attribute is written or STN.KFAST (see STN block description) is set the server automatically polls for STN.PV and STN.CO values for the interval and rate defined by this setting. This feature is very useful for loop tuning software. Setting the fast update interval to zero will disable it.
Set .KFAST on K tag writes*	Boolean	Config	When set, any write to the PID tuning tags (.K*, OUT_HI_LIM AND OUT_LO_LIM) will automatically turn .KFAST on.
NON-KEYED STN FAST UPDATE	Boolean	Config	When STN block fast update is in effect, the process variable and control output are received by polling instead of exception reporting. This option causes the poll messages to be sent as non-keyed messages. It should only be enabled when the communication scheme is redundant channel. Try enabling this option if the STN fast update poll rate is not being achieved using normally keyed messaging.
Represent STN Mode As 0 - 5	Boolean	Config	Normally the STN block represents mode in the range of 0 – 2 where 0 = manual, 1 = auto and 2 = cascade / ratio. This representation is the same regardless of the current station operating level (local or computer). The station level is monitored and controlled using the STN_LEVEL tag. Setting this option changes the STN mode representation to be in the range 0 – 5 where 0 = local manual, 1 = local auto, 2 = local cascade / ratio, 3 = computer manual, 4 = computer auto and 5 = computer cascade / ratio. This option allows clients to control STN mode and level via the STN.MODE tag.
AUTOMATIC SEND STN CPU_OK	Boolean	Config	Instructs OPC90 to send CPU_OK messages to any STN block that is in computer level control. The frequency of these messages will be ¾ of the current STN block computer watchdog time setting.
NODE01 to NODE63	Array of 8 Bit UINTs	Config	Defines the node map required for ABB Bailey Network 90 systems when the time synchronization option has been enabled (see note 2). For each possible node number, one of the following choices must be selected; Vacant, 1.4K Tag OIU, PCU, CIU01, Other. The node map must be accurately defined for time synchronization to function correctly on Network 90 based systems. These attributes are ignored when time synchronization is disabled or an Infi 90 system has been specified or detected.
SIMULATION	Boolean	Config	Two types of simulation can be selected. Selecting “Device and input blocks”, simulates communication with the interface and reception of values. The type of value simulation is configurable for each block attribute by right clicking on the attribute and selecting properties and than the simulation signal type. The selections are sine, ramp, random and constant. Selecting the “AOL and DOL block input” simulation option

			causes communication with the interface to occur normally with the input values to the AOL and DOL blocks to be automatically updated with simulated values that would normally be provided by an OPC client. This simulation option also allows configuration of the percent of the total values to change per second.
TAG STARTUP	Array	Config	Picks the initial OPC status that will be reported to OPC clients for all of the tag values until the Bailey interface has been initialized with the configured database and has begun to report the actual values.
STARTUP Complete	Boolean	Config	Normally the STARTUP device tag resets when all of the points are established in the CIU. Setting this option delays the STARTUP reset condition until after all of the blocks receive initial values from the ABB Bailey DCS.
Set Bad Output Quality on Max Exception Timeout	Boolean	Config	The QUALITY tag will indicate bad for AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC and OSTN blocks when writes to the input tags do not occur within the block's exception report output max time setting. When this occurs the bad quality condition is also written to the CIU and therefore propagated to the users of these data points in the ABB Bailey system. This property should only be used when OPC clients writing the input values to these blocks does so on a regular basis even when the value has not changed (see next property).
Any Input Write Applies to All Output Blocks	Boolean	Config	With this option set, an input write to any AOL, DOL, ODD, OMSDD, ORCM, ORMC, PRMSC and OSTN block reset the internal bad quality maximum timer for all of these blocks. This option is useful when digitals are not changing and therefore not being written on a regular basis whereas analogs usually are. A write to any input value becomes the indicator the OPC client is still alive.
CONTINUOUS OPC UPDATES	Boolean	Config	Instructs OPC90 to report all data change tags at the data change cycle even when they have not changed from the last reported value. This option is useful when interfacing to OPC clients that mark OPC data stale or bad when it is not received on a regular basis. Most clients do not need this option to be set.
XRP WRITE CONFIRM	Boolean	Config	Supervisory control writes to DD, MSDD, RCM, RMC, RMSC and STN blocks are sent directly to the Bailey system without updating the OPC tag database. The OPC tag database gets updated when the Bailey exception report is received confirming the write was received and accepted. This option may be useful when implementing OPC client supervisory control ramping functions. Also some Bailey block logic could have supervisory control locks in place. These locks prevent the block from completing the request but no exception report is generated indicating the request was rejected.

GROUP WRITES	Boolean	Config	When set, output exception reports generated from AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC and OSTN blocks will be written using the output group commands. Up to fifty values per command can be written. OPC90 automatically determines the group size based on current loads and output block updates. This setting optimizes output exception reporting and should be used when large numbers of output bocks are configured. When this option is not set, each value is sent with individual commands. The rate at which outputting occurs is also configurable. See the OUT XRP UPDATE setting.
DEBUG LOG	Boolean Array	Config	Selected by right clicking on the DEVICE block. Enables various logging features that may be useful for diagnosing driver operational performance. When any of the logging features are enabled, daily log files are generated in the OPC90 program directory. Leaving all but the error option enabled for extended periods of time can consume a lot of disk space. The four logging options supported are: Errors – post miscellaneous errors Events – post communication events Sends – post messages sent to interface. Receives – post messages received from interface.
LOG_DAYS	VT_I4	Config	Number of days the debug logs should be retained. Logs older than the number of days indicated by this setting will be automatically deleted.
MESSAGE	VT_BSTR	Read	Text message indicating overall status of the device.
POINT_TOTAL	VT_I4	Read	Total blocks this DEVICE block has been requested to exchange data with the Bailey system.
PRI_STATUS	VT_I4	Read	Primary communication channel status. A value of zero indicates good and one means bad.
SEC_STATUS	VT_I4	Read	Secondary communication channel status. A value of zero indicates good and one means bad or not used.
MSG_TOTAL	VT_I4	Read	Running count of total messages being exchanged with the Bailey interface.
MSG_RATE	VT_I4	Read	Messages per second being exchanged with the Bailey interface.
XRPS_TOTAL	VT_I4	Read	Running count of total exception report specifications received from the Bailey interface.
XRP_TOTAL	VT_I4	Read	Running count of total exception reports exchanged with the Bailey interface.
XRP_RATE	VT_I4	Read	Exception reports per second being exchanged with the Bailey interface.
POLL_TOTAL	VT_I4	Read	Running count of total values polled from the Bailey interface.
POLL_RATE	VT_I4	Read	Polled values per second being read from the Bailey interface.
NAK_TOTAL	VT_I4	Read	Running count of total negative acknowledgments received from the Bailey Interface.

MY_DEVICE	VT_BSTR	Read	Text message indicating the ABB Bailey interface type (i.e. INICI03, CIC01, etc) and firmware revision.
MY_RING	VT_I4	Read	Ring address of the Bailey interface.
MY_NODE	VT_I4	Read	Node address of the Bailey interface.
SHADOW_OK	VT_BOOL	Read	Shadowing OK (0-Good, 1-Bad or Disabled)
SHADOW_MASTER	VT_BOOL	Read	Currently Shadow Master (0-No, 1-Yes)
SHADOW_PRI_STATUS	VT_I4	Read	Shadowed CIU primary communication channel status. A value of zero indicates good and one means bad or not used.
SHADOW_SEC_STATUS	VT_I4	Read	Shadowed CIU secondary communication channel status. A value of zero indicates good and one means bad.
SHADOW_MY_RING	VT_I4	Read	Shadowed CIU ring address of the Bailey interface.
SHADOW_MY_NODE	VT_I4	Read	Shadowed CIU node address of the Bailey interface.
SHADOW_MY_DEVICE	VT_BSTR	Read	Text message indicating the shadowed ABB Bailey interface type (i.e. INICI03, CIC01, etc) and firmware revision.
SYNC_DCS	VT_BOOL	Read/Write	Set this tag to request the DCS to be time synced to the current PC clock time (see note 2).
SYNC_RING	VT_I4	Read	Ring address of current time sync master (see note 2).
SYNC_NODE	VT_I4	Read	Node address of current time sync master (see note 2).
IMPORT_FILE	VT_BSTR	Read/Write	CSV file to import (see note 3)
IMPORT_READ	VT_BOOL	Read/Write	CSV file import control flag (see note 3)
IMPORT_RESULT	VT_BSTR	Read	Result of CSV import request (see note 3)

Notes:

1.) The DEVICE Definition block is designed to support communication on one or two RS232 ports to a single Bailey interface or two RS232 or SCSI ports to redundant Bailey interfaces. The first redundant scheme is single interface redundant channel. This scheme provides two RS232 communication paths to a single Bailey interface. All Bailey interfaces except (SPM, CPM, CIC, CIU01, INPCI01 and INICI03) have two RS232 ports available for communication. The second port is switch selectable between a “utility” port and computer communication port. Setting it to a computer communication port allows it to be used for the single interface redundant channel communication scheme. With single interface redundant channel, the driver issues exception report read requests to both channels resulting in increased throughput. If loop tuning software has one or more STN blocks in fast update mode, exception report reading on the second channel is temporarily stopped and instead it is used for polling the STN block process variable and control outputs. This feature helps facilitate tuning of fast loops that typically require 4 or more updates per second even when the active database is very large. When the STN blocks are taken out of fast update mode, exception report collection on the second channel will resume. The second redundant scheme is dual interfaces single channel. This scheme utilizes two Bailey interfaces. Each Bailey interface can be assigned the same node address on the Bailey communication highway or given unique addresses. When the Bailey interfaces are configured for the same node address, the driver commands the primary interface online to the Bailey communication loop and commands the secondary interface offline. The database is downloaded to both interfaces so the secondary can be considered to be in a “warm” standby mode, ready to be commanded online if the primary interface fails. When the Bailey interfaces are configured for different node addresses the driver commands both interfaces online receiving exception report data from each. This increases the effective data throughput. The decision of Bailey node address assignment should be based on whether or not any OPC90 Server AOLs, DOLs, ODDs, OMSDD, ORCMs, ORMCs, ORMSCs or OSTNs blocks are to be utilized. When they are used, the Bailey interfaces should be assigned the same node address. Otherwise, when AOLs, DOLs, ODDs, OMSDD, ORCMs, ORMCs, ORMSCs and OSTNs are not used, unique node addresses should be assigned to take advantage of the extra throughput. When the interfaces are assigned unique addresses, exception report collection will be temporarily stopped on the secondary interface when loop tuning software has one ore more STN blocks in fast update mode. This allows the use of that interface for the required STN fast update poll commands. This feature helps facilitate tuning of fast loops that typically require 4 or more updates per second even when the active database is very large. When the STN blocks are taken out of fast update mode, exception report collection on the second interface will resume.

2.) The DEVICE definition block support selection of several time syncing options. Note that the ability for time syncing to function correction depends on several factors. The most important being that the ABB Bailey interface supports the time syncing feature. Those interfaces that do not support time syncing are NSPM01, IMSPM01, IMCPM02, NCIU01 and INPCI01. Note also that time syncing will not work properly on Network 90 systems that have 1400 tag OIUs present on the ABB Bailey Plant Loop. The SYNC_DCS, SYNC_RING and SYNC_NODE tags are only updated when one of the following time sync options are enabled. When they are, the SYNC_DCS tag can be used to force the DCS to be time synced to the PC clock time. This also automatically occurs when the PC clock is changed by more than 2 minutes.

a.) To enable time syncing the ABB Bailey system type must first be specified. Choices are Infi 90 and Network 90. When the system type is Network 90 the system node map must also be configured. This node map defines the addresses and type of nodes present on the ABB Bailey Plant Loop. Failure to completing and accurately configure the node map could result in malfunction of the time syncing feature. Note that it is not necessary to configure the node map when the system type is Infi 90. Also note that the Infi 90 system type should be specified when the interface is a NCIC01.

b.) Two time syncing options are available. The first is “PC Get & Set Bailey System Time”. This option enables OPC90 to both set the ABB Bailey DCS time to match the PC time and also set the PC time to match the current DCS time. When OPC90 starts up with this option set it determines if another ABB Bailey node is currently considered the time sync master. If another master exists, OPC90 sets the PC time equal to the current DCS time. When it is determined that no node is currently the time sync master, OPC90 becomes the master by setting the DCS time equal to the PC time. OPC90 continues to monitor the PC clock for changes in time that exceed 2 minutes. When that occurs OPC90 will become the time sync master by setting the DCS time to the PC time. The second time syncing option is “PC Get Bailey System Time”. This option enables OPC90 to keep the PC time equivalent to the DCS time but keeps OPC90 from ever setting the DCS time. This option is handy for keeping the PC time equal to the DCS time that is being maintained by another time sync source.

c.) When the ABB Bailey DCS is an Infi 90 system and either time syncing option is selected, the “Use DCS Timestamp” option may also be enabled. This option causes the OPC time stamps associated with each data value to be set to the time stamp generated within the DCS. Normally per the OPC foundation specification, OPC90 generates the OPC value time stamp when the value is sent to the OPC client. This option allows more precise time stamping data to be associated with each value. It should be noted this occurs at the expense of slightly reduced exception report throughput since each exception reported value received from the interface will also include a 6 byte DCS time stamp. This option provides sub second time stamp accuracy versus the 1-2 second time stamp accuracy when not enabled. The “Allow DCS timestamp Override” option can be enabled to comply with OPC foundation specification concerning sync reads. When enabled, OPC90 overrides the DCS timestamps to the current PC timestamp for all points read by OPC clients using the sync read function.

d.) The “Y2k Time Warping” option allows the PC time to remain in the present (year 2000 through 2021) while time syncing the ABB Bailey DCS to calendar years prior to year 2000 in the range of 1980 to 1999. OPC90 will set the DCS time to pre 2000 years that have calendars that match the present day calendar. This option is useful for ABB Bailey systems having controller firmware that is not Y2k compatible but having control events that must occur based on a specific day of the week (Monday, Tuesday, Wednesday, etc). Note that this option is mutually exclusive with the “use DCS Timestamp” option previously discussed. There are two important factors that must be considered when using this option. The first is that it must be enabled for all PCs running OPC90 that have the time syncing option enabled. The second is its use is not recommended for systems that also have other nodes present (like ABB Bailey consoles) that are configured to participate in time syncing or are using the ABB Bailey distributed trending functionality. The following table presents the time warping algorithm used by this option:

Present Year	Mapped to Past Year
2000, 2006, 2017	1995
2001, 2007, 2018	1990
2002, 2013, 2019	1991
2003, 2014	1997
*2004	1999, 1998
2005, 2011	1994
2008	1980
2009, 2015	1998
2010	1999
2012	1984
2016	1988
2020	1992
2021	1999

* 1/1/2004 thru 2/28/2004 are mapped to 1998 calendar year,
2/29/2004 is mapped to 3/1/1998 (matches day of the week),
3 /1/2004 thru 12/31/2004 are mapped to 1999 calendar year.

3.) An OPC client can use the these tags to import a CSV file into the OPC90 database. The CSV file can only contain new blocks to be added within an existing device. Lines that reference existing blocks or new devices will be ignored. The file to be imported is specified by the IMPORT_FILE tag. The default directory of C:\Program Files\OPC90 Server\CSV will be assumed unless otherwise specified with the file name. Setting the IMPORT_READ tag will request the CSV file to be imported. OPC90 will reset this flag when the import has been completed. The result of the import will be will be written to the IMPORT_RESULT tag. A log file that summarizes the result of the import will also be generated. It is stored in the same directory as the CSV file imported. It has the same name as the CSV file but with a “.LOG” extension. The log file is a standard text file that can be viewed using

NOTEPAD. After completion of the import, the OPC90 database is automatically saved.

7.8.1 SCSI Communication

The DEVICE definition block supports SCSI communication with the INICI03. When a device block is configured, OPC90 will automatically detect the currently installed SCSI bus adapter(s) and search each adapter bus for INICI03 devices. Detected devices will appear in the primary and secondary port list boxes that are part of the DEVICE block properties. They are listed as devices like S0001:, S0002: etc. The 'S' indicates SCSI followed by the adapter card number, adapter bus number, adapter logical unit number and INICI03 SCSI target ID. Note that the target ID is the value set by switches on the Bailey INICI03 INICI03A module. The INICI03 must be powered up, configured to utilize its SCSI communication channel and attached to a PC SCSI host adapter card.

Just about any PC SCSI card that supports external connection to the INICI03 IMMPIO1 module's 50 pin SCSI socket should work ok with the exception of cards designed for use as raid controllers. RoviSys validated SCSI communication using Adaptec model 2930, 29160 and Domex model 3194U SCSI controller cards.

Note that for PCIX based PCs, the Adaptec 29320A ***does not work,*** use the 29160.

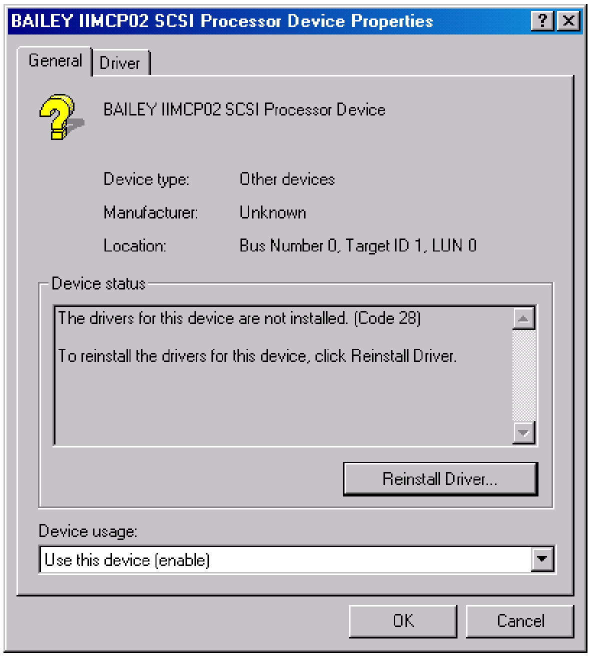
Adjustment to the SCSI BIOS might be necessary. The BIOS setup can be configured when the PC is booting. Following are general guidelines for typical settings. Depending on the type of SCSI card, all of these settings or the terminology might be different.

* SCSI Parity Checking: Enabled
* Host Adapter SCSI Termination: Automatic
* Initiate Sync Negotiation: Yes (IDs 0 - 7)
* Max Sync Transfer Rate: 20 MB/Sec (IDs 0 - 7)
* Enable Disconnect: Yes (IDs 0 - 7)
* Send Start Unit Command: No (IDs 0 - 7)
* BIOS Multiple LUN Support: No (IDs 0 - 7)
* Include in bios scan Yes (IDs 0 - 7)
* Plug and Play SCAM support: Disabled
* Reset SCSI Bus at IC Init: Disabled
* Extended bios Translate for DOS ICs: Enabled
* BIOS support for Int 13 extensions: Enabled

Depending on the operating system, OPC90 utilizes the Advanced SCSI Programming Interface (ASPI) or SCSI Pass Through Interface (SPTI) to communicate with the INICI03 via the host controller driver. If your system does not have ASPI it can be loaded by double clicking on the ASPI32.EXE file installed in the same directory as OPC90. Do NOT install ASPI32.EXE with

Windows 2000, Windows ME, Windows XP, Easy CD Creator 4.x, or with Windows Media Player 7.0. If you have one of these applications (or operating systems), you will be using a different ASPI layer that will conflict with the one provided in this file.

The only other driver that needs to be loaded is the standard manufacturer driver provided with the SCSI card or the resident driver recommended by Windows. It is not necessary to load the Bailey semAPI driver. Note that for some plug and play systems, the INICI03 will be listed as "Another Device" when the system is first booted up. This is normal. Accept it as another device and request it to be used (enabled) even though a specific driver for that device has not been loaded. The properties for this other device will list the INICI03 as follows:


BAILEY IIMCP02 SCSI Processor Device Properties

BAILEY IIMCP02 SCSI Processor Device

Device type: Other devices
Manufacturer: Unknown
Location: Bus Number 0, Target ID 1, LUN 0

Device status

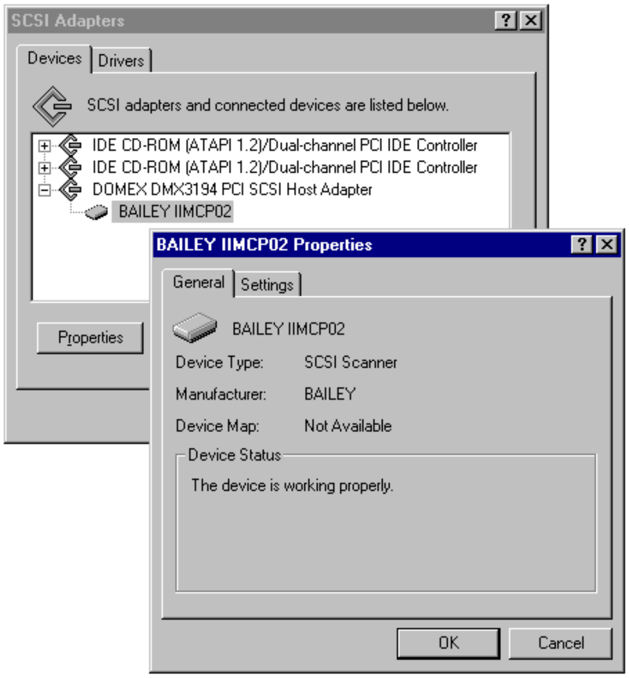
The drivers for this device are not installed. (Code 28)

To reinstall the drivers for this device, click Reinstall Driver.

Device usage: Use this device (enable)

Notice that the INICI03 identifies itself to the SCSI adapter card as "BAILEY IIMCP02 SCSI Processor Device". Again this is normal. You do not need to reinstall a driver for this device type. Also notice the location of the device is given by the above dialog. For this example the OPC90 will assigned "S0001:" as the device identity.

For systems that don't support plug and play (default NT installations), the INICI03 device will appear under control panel, SCSI Adapters as follows:



SCSI Adapters

SCSI adapters and connected devices are listed below.

- IDE CD-ROM (ATAPI 1.2)/Dual-channel PCI IDE Controller
- IDE CD-ROM (ATAPI 1.2)/Dual-channel PCI IDE Controller
- DOMEX DMX3194 PCI SCSI Host Adapter
  - BAILEY IIMCP02

BAILEY IIMCP02 Properties

BAILEY IIMCP02

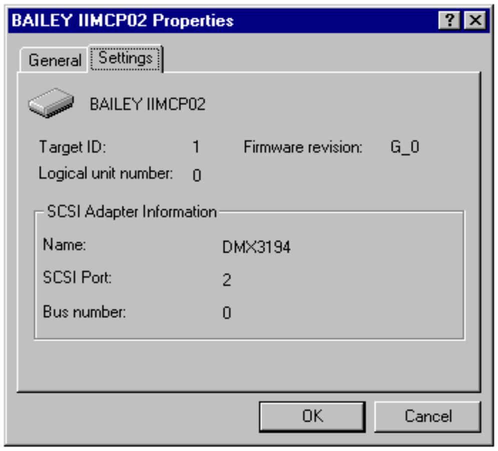
Device Type: SCSI Scanner

Manufacturer: BAILEY

Device Map: Not Available

Device Status

The device is working properly.



BAILEY IIMCP02 Properties

BAILEY IIMCP02

Target ID: 1 Firmware revision: G_0

Logical unit number: 0

SCSI Adapter Information

Name: DMX3194

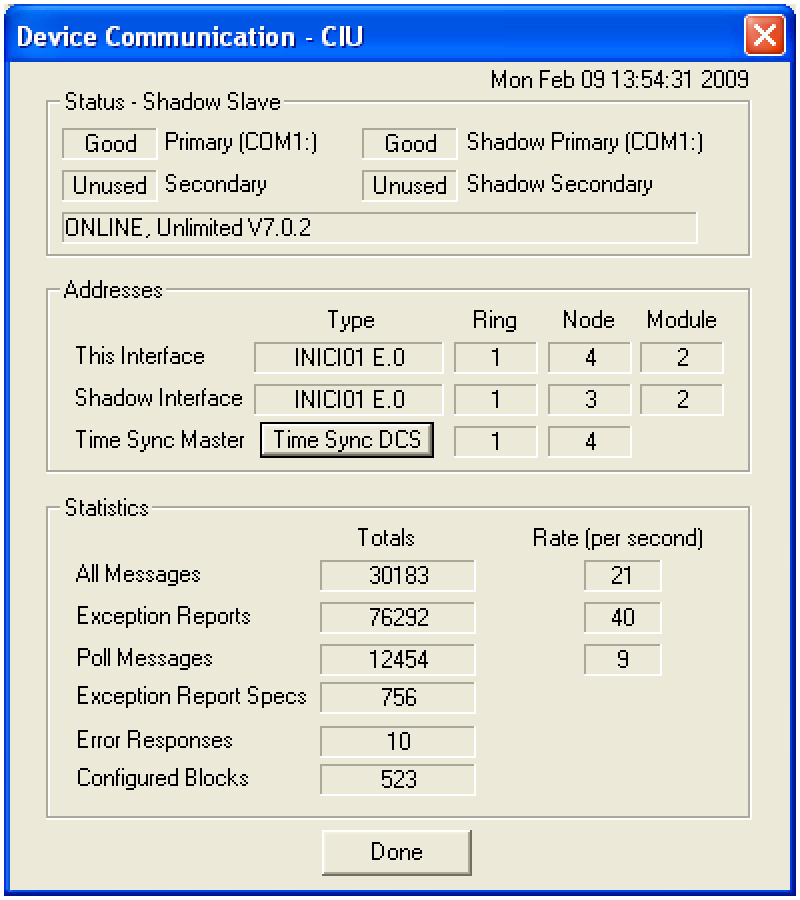
SCSI Port: 2

Bus number: 0

Notice that the INICI03 identifies itself to the SCSI adapter card as “BAILEY IIMCP02 SCSI Scanner” This is normal. The location of the device is given in the settings property dialog. For this example OPC90 will assigned “S2001:” as the device identity.

7.8.2 Device Communication Faceplate

The DEVICE block includes a faceplate that summarizes important communication information associated with the device block. To display the faceplate, right click on the DEVICE block and select “Faceplate”. The following faceplate will be displayed:



Device Communication - CIU

Mon Feb 09 13:54:31 2009

Status - Shadow Slave

Good	Primary (COM1:)	Good	Shadow Primary (COM1:)
Unused	Secondary	Unused	Shadow Secondary

ONLINE, Unlimited V7.0.2

Addresses

	Type	Ring	Node	Module
This Interface	INICI01 E.0	1	4	2
Shadow Interface	INICI01 E.0	1	3	2
Time Sync Master	Time Sync DCS	1	4	

Statistics

	Totals	Rate (per second)
All Messages	30183	21
Exception Reports	76292	40
Poll Messages	12454	9
Exception Report Specs	756	
Error Responses	10	
Configured Blocks	523	

Note that the “Time Sync DCS” button shown on this faceplate only appears if the Device block has been setup to participate in time syncing. It will appear grey while waiting for the proper conditions needed to request a DCS time sync to occur. The CIU must be communicating, not in standby operation, and the current time sync master has been determined. This is indicated by a non-zero node number appearing for the current time sync master.

7.9 ← Digital Input Loop (DIL)

The DIL OPC90 block is used to retrieve the exception reported output from Bailey Digital Output / Loop blocks (function code 45). It can also be used to retrieve digital inputs defined within Bailey Logic Master Modules Group I/O definitions.

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
OUTLSD0	VT_BSTR	Config/Read	Output state zero logic state descriptor.
OUTLSD1	VT_BSTR	Config/Read	Output state one logic state descriptor.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
DISC_LIM	VT_UI2	Read	Discrete alarm state.
DISC_ACT	VT_BOOL	Read	Alarm active indicator.
OUT	VT_BOOL	Read	Bailey discrete output value.
OUT_TEXT	VT_BSTR	Read	Bailey discrete output value as a string.

7.10 → Digital Output Loop (DOL)

The DOL OPC90 block is used to send an exception reported output generated by updates to the block input tag (IN). The exception reports can be received by a Bailey console digital tag, Bailey Digital Input / Loop blocks (function code 42) and Digital Input / Infinet blocks (function code 122). Note that this block does not received data from a DOL (FC 45) block running in a Bailey controller. Use the OPC90 DIL block for that purpose. The OPC90 DOL block will automatically generate the appropriate quality, and alarming status based on the value presented at the block input.

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02) and computer interface command series (CIC).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey CIU ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey CIU node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey CIU module address.
ADDR_BLOCK	VT_I2	Config/Read	Block number to establish this point at within the Bailey interface (see note 1).
MAX_TIME	VT_I4	Config/Read	If IN never changes, it will be reported at the maximum time interval (seconds) defined by this attribute.
ALARM_STATE	VT_BOOL	Config/Read	The setting for the Bailey alarm limit used to derive the alarm condition (see note 2).
INIT_VALUE	VT_BOOL	Config/Read	The IN value used to send initially when MAX_TIME is exceeded if an OPC Client has not written to it.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
IN	VT_BOOL	Read/Write	Discrete input value to be exception reported to Bailey.
QUALITY	VT_BOOL	Read/Write	Current quality (see note 3) of Bailey values (0-good, 1-bad).
DISC_LIM	VT_UI2	Read	OPC90 discrete alarm state.
DISC_ACT	VT_BOOL	Read	Alarm active indicator.
OUT	VT_BOOL	Read	Last discrete input value reported to Bailey.

Notes:

1.) Make sure the block number attribute is unique with respect to the other other DOL, AOL, ODD, OMSDD, ORCM, ORMC, ORMSC and OSTN OPC90 blocks associated with the same Bailey Interface Definition block. The block number attribute must also be defined within the range of 1 to maximum number of allowed outputs set up within the associated OPC90 Interface DEVICE block. The Bailey system will receive data from this block at the ring and node address of the Bailey CIU interface, module two and block number defined by the BLOCK attribute.

2.) This attribute is used to setup output alarming states. A value of 0 indicates flag alarm when output state is zero. A value of 1 indicates flag alarm when output state is one. A value of 2 indicates never flag an alarm.

3.) When the Device block “Set bad quality of max exception timeout” property is enabled, the QUALITY tag of this block will be set bad if writes to the block input(s) do not occur within the Exception Report Output Max Time setting of the block. When this occurs, bad quality will also be written to the CIU and therefore propagated to the users of the block data within the ABB Bailey system. The quality can also be set bad by writing a one (1) to this tag.

7.11 Harmony Analog Input (HAI)

The HAI OPC90 block is used to retrieve the exception reported output from Bailey Harmony Analog Input (function code 222) blocks.

Restrictions: This OPC block is only valid for Bailey interface types INICI03, INICI12 and INICI13.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
CHAN_NAME	VT_BSTR	Read	Channel name assigned to this point
CHAN_TYPE	VT_I2	Read	Channel type code
CHAN_STATE	VT_BOOL	Read	Channel state (0-Ok, 1-Open, 2-Short, 3-Overdrive)
ALARM_CODE	VT_I2	Read	Alarm code
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
QUAL_PROP	VT_BOOL	Read	Propogated Quality (0-Good, 1-Bad)
OUT	VT_R4	Read	Current output value from Bailey.
HIGH	VT_R4	Read	High signal value in Engineering Units.
LOW	VT_R4	Read	Low signal value in Engineering Units.
SIG_CHANGE	VT_R4	Read	Significant change in % of range
EU	VT_I2	Read	Engineering Units Code.
EU_TEXT	VT_BSTR	Read	Engineering Units String.
HI_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the high alarm condition. Writing a new value to this attribute automatically tunes the alarm limit of the associated Bailey block.
LO_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the low alarm condition. Writing a new value to this attribute automatically tunes the alarm limit of the associated Bailey block.
HI_ACT	VT_BOOL	Read	High alarm active indicator.
LO_ACT	VT_BOOL	Read	Low alarm active indicator.
OVR_ENABLE	VT_BOOL	Read	Override allowed (0-No, 1-Yes)
OVR_VALUE	VT_R4	Read	Override value
OVR_STATUS	VT_BOOL	Read	Value overridden (0-No, 1-Yes)
STAT_INHIBT	VT_BOOL	Read	Status inhibit (0-No, 1-Yes)
SUSPECT	VT_BOOL	Read	Value suspect (0-No, 1-Yes)
DRIVEN_LO	VT_BOOL	Read	Low overdriven value (0-No, 1-Yes)
DRIVEN_HI	VT_BOOL	Read	High overdriven value (0-No, 1-Yes)
CONFIG_ERR	VT_BOOL	Read	Configuration error exists (0-No, 1-Yes)
READBACK	VT_BOOL	Read	Readback status (0-Good, 1-Bad)
REFERENCE	VT_BOOL	Read	Reference status (0-Good, 1-Bad)
CALIBRATION	VT_BOOL	Read	Calibration status (0-Good, 1-Bad)
SIM_ENABLE	VT_BOOL	Read	Simulation enable indicator
SIM_BLOCK	VT_I2	Read	Simulation value block number

7.12 Harmony Analog Output (HAO)

The HAO OPC90 block is used to retrieve the exception reported output from Bailey Harmony Analog Output (function code 223) blocks.

Restrictions: This OPC block is only valid for Bailey interface types INICI03, INICI12 and INICI13.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
CHAN_NAME	VT_BSTR	Read	Channel name assigned to this point
CHAN_TYPE	VT_I2	Read	Channel type code
CHAN_STATE	VT_BOOL	Read	Channel state (0-Ok, 1-Open, 2-Short, 3-Overdrive)
ALARM_CODE	VT_I2	Read	Alarm code
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
QUAL_PROP	VT_BOOL	Read	Propogated Quality (0-Good, 1-Bad)
OUT	VT_R4	Read	Current output value from Bailey.
HIGH	VT_R4	Read	High signal value in Engineering Units.
LOW	VT_R4	Read	Low signal value in Engineering Units.
SIG_CHANGE	VT_R4	Read	Significant change in % of range
EU	VT_I2	Read	Engineering Units Code.
EU_TEXT	VT_BSTR	Read	Engineering Units String.
HI_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the high alarm condition. Writing a new value to this attribute automatically tunes the alarm limit of the associated Bailey block.
LO_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the low alarm condition. Writing a new value to this attribute automatically tunes the alarm limit of the associated Bailey block.
HI_ACT	VT_BOOL	Read	High alarm active indicator.
LO_ACT	VT_BOOL	Read	Low alarm active indicator.
OVR_ENABLE	VT_BOOL	Read	Override allowed (0-No, 1-Yes)
OVR_VALUE	VT_R4	Read	Override value
OVR_STATUS	VT_BOOL	Read	Value overridden (0-No, 1-Yes)
STAT_INHIBT	VT_BOOL	Read	Status inhibit (0-No, 1-Yes)
SUSPECT	VT_BOOL	Read	Value suspect (0-No, 1-Yes)
DRIVEN_LO	VT_BOOL	Read	Low overdriven value (0-No, 1-Yes)
DRIVEN_HI	VT_BOOL	Read	High overdriven value (0-No, 1-Yes)
CONFIG_ERR	VT_BOOL	Read	Configuration error exists (0-No, 1-Yes)
READBACK	VT_BOOL	Read	Readback status (0-Good, 1-Bad)
REFERENCE	VT_BOOL	Read	Reference status (0-Good, 1-Bad)
CALIBRATION	VT_BOOL	Read	Calibration status (0-Good, 1-Bad)
SIM_ENABLE	VT_BOOL	Read	Simulation enable indicator
SIM_BLOCK	VT_I2	Read	Simulation value block number

7.13 Harmony Digital Input (HDI)

The HDI OPC90 block is used to retrieve the exception reported output from Bailey Harmony Digital Input (function code 224) blocks.

Restrictions: This OPC block is only valid for Bailey interface types INICI03, INICI12 and INICI13. This OPC block does not support the reception of Harmony digital input sequence of events data.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
OUTLSD0	VT_BSTR	Config/Read	Output state zero logic state descriptor.
OUTLSD1	VT_BSTR	Config/Read	Output state one logic state descriptor.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
CHAN_NAME	VT_BSTR	Read	Channel name assigned to this point
CHAN_STATE	VT_BOOL	Read	Channel state (0-Ok, 1-Open, 2-Short, 3-Overdrive)
ALARM_CODE	VT_I2	Read	Alarm code
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
QUAL_PROP	VT_BOOL	Read	Propogated Quality (0-Good, 1-Bad)
OUT	VT_R4	Read	Current output value from Bailey.
OUT_TEXT	VT_BSTR	Read	Discrete Output Value as Text
DISC_LIM	VT_UI2	Read	Discrete alarm state.
DISC_ACT	VT_BOOL	Read	Alarm active indicator.
OVR_ENABLE	VT_BOOL	Read	Override allowed (0-No, 1-Yes)
OVR_VALUE	VT_BOOL	Read	Override value
OVR_STATUS	VT_BOOL	Read	Value overridden (0-No, 1-Yes)
STAT_INHIBT	VT_BOOL	Read	Status inhibit (0-No, 1-Yes)
SUSPECT	VT_BOOL	Read	Value suspect (0-No, 1-Yes)
CONFIG_ERR	VT_BOOL	Read	Configuration error exists (0-No, 1-Yes)
READBACK	VT_BOOL	Read	Readback status (0-Good, 1-Bad)
SIM_ENABLE	VT_BOOL	Read	Simulation enable indicator
SIM_BLOCK	VT_I2	Read	Simulation value block number

7.14 Harmony Digital Output (HDO)

The HDO OPC90 block is used to retrieve the exception reported output from Bailey Harmony Digital Output (function code 225) blocks.

Restrictions: This OPC block is only valid for Bailey interface types INICI03, INICI12 and INICI13.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
OUTLSD0	VT_BSTR	Config/Read	Output state zero logic state descriptor.
OUTLSD1	VT_BSTR	Config/Read	Output state one logic state descriptor.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
CHAN_NAME	VT_BSTR	Read	Channel name assigned to this point
CHAN_STATE	VT_BOOL	Read	Channel state (0-Ok, 1-Open, 2-Short, 3-Overdrive)
ALARM_CODE	VT_I2	Read	Alarm code
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
QUAL_PROP	VT_BOOL	Read	Propogated Quality (0-Good, 1-Bad)
OUT	VT_R4	Read	Current output value from Bailey.
OUT_TEXT	VT_BSTR	Read	Discrete Output Value as Text
DISC_LIM	VT_UI2	Read	Discrete alarm state.
DISC_ACT	VT_BOOL	Read	Alarm active indicator.
OVR_ENABLE	VT_BOOL	Read	Override allowed (0-No, 1-Yes)
OVR_VALUE	VT_BOOL	Read	Override value
OVR_STATUS	VT_BOOL	Read	Value overridden (0-No, 1-Yes)
STAT_INHIBT	VT_BOOL	Read	Status inhibit (0-No, 1-Yes)
SUSPECT	VT_BOOL	Read	Value suspect (0-No, 1-Yes)
CONFIG_ERR	VT_BOOL	Read	Configuration error exists (0-No, 1-Yes)
READBACK	VT_BOOL	Read	Readback status (0-Good, 1-Bad)
SIM_ENABLE	VT_BOOL	Read	Simulation enable indicator
SIM_BLOCK	VT_I2	Read	Simulation value block number

7.15 ♥ Module Status (MODSTAT)

The MODSTAT OPC90 block is used to retrieve module status summary information and detailed module problem reports. This block is designed to work with all Bailey node and module types.

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address (note 1).
ADDR_NODE	VT_I2	Config/Read	Bailey node address (note 1).
ADDR_MODULE	VT_I2	Config/Read	Bailey module address (note 1).
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
COLUMNS	VT_I2	Read/Write	Number of columns (characters) per line to use when generating problem report text. Values from 50 to 130 are allowed.
READ	VT_BOOL	Read/Write	Set this attribute to request module problem reports to be read for the Bailey module status defined for this block. The problem reports are written to the LINE01 to LINE50 attributes. The driver will reset this attribute when the read request is completed.
NEXT	VT_BOOL	Read/Write	Set this attribute to request a read of the next group of problem reports. The problem reports are written to the LINE01 to LINE50 attributes. The driver will reset this attribute when the next problem report read request is completed.
LINES	VT_I2	Read/Write	Number of lines to utilize when generating problem report text. Values from 2 to 50 are allowed.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
OUT	VT_BOOL	Read	Indicates whether or not the Bailey module is currently experiencing any errors. A value of zero indicates no errors. A value of one indicates one or more errors. They can be determined by examining the STATUS_TEXT attribute and requesting problem reports.
LINE01 to LINE50	VT_BSTR	Read	Requested problem report text strings are written to these attributes.
STATUS_TEXT	VT_BSTR	Read	Overview status of the addressed Bailey module (see note 2).
STAT_BYTE01 to STAT_BYTE16	VT_I2	Read	Bailey module status bytes. Only the first 5 are valid for Command Series and Network 90 systems. All sixteen are valid for Infi 90 systems.
STAT_BYTE01_BIT0 to STAT_BYTE16_BIT7	VT_BOOL	Read	Bailey module status bytes broken apart into individual bits. All eight bits are

			presented for all sixteen module status bytes. Bit 0 is the least significant bit.

Notes:

1.) When retrieving the module status of a CIU interface special attention must be given to the settings of ring, node and module. For all CIU interfaces except the CIU01, the ring must match the ring address of the CIU, node must match the node address of the CIU and module must be set to a value of two. For the CIU01 interface, ring and node must be set to a value of zero and module to a value of two. Failure to follow these rules will result in improper or no module status returned for the CIU interface.

2.) The status of the Bailey module is returned as a string in the following format "<Type>, <State>, <Errors>" where type indicates the module type (AMM, MFC, COM, etc), state indicates its current state of operation (Execute, Configure, Error) and errors are a summary of any current errors it is experiencing. The text for module state and type are defined in the OPC90_BLY.INI file stored in the windows base directory. It may be edited to customize message generation. The [MODULE STATE] section defines the text for module state. The [MODULE TYPE] section defines the text for module type. You may edit the names or add new type codes and associated names that correspond to new Bailey modules introduced after any given revision to the OPC90 Connect - Bailey.

7.16 Multi-State Device Driver (MSDD)

The MSDD OPC90 block is used to retrieve and control the exception reported output from Bailey Multi-State Device Driver blocks (function code 129).

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
F1LSD0	VT_BSTR	Config/Read	Feedback 1 state zero logic state descriptor.
F1LSD1	VT_BSTR	Config/Read	Feedback 1 state one logic state descriptor.
F2LSD0	VT_BSTR	Config/Read	Feedback 2 state zero logic state descriptor.
F2LSD1	VT_BSTR	Config/Read	Feedback 2 state one logic state descriptor.
F3LSD0	VT_BSTR	Config/Read	Feedback 3 state zero logic state descriptor.
F3LSD1	VT_BSTR	Config/Read	Feedback 3 state one logic state descriptor.
F4LSD0	VT_BSTR	Config/Read	Feedback 4 state zero logic state descriptor.
F4LSD1	VT_BSTR	Config/Read	Feedback 4 state one logic state descriptor.
GSLSD0	VT_BSTR	Config/Read	Good state zero logic state descriptor.
GSLSD1	VT_BSTR	Config/Read	Good state one logic state descriptor.
GSLSD2	VT_BSTR	Config/Read	Good state two logic state descriptor.
GSLSD3	VT_BSTR	Config/Read	Good state three logic state descriptor.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
FACE_TYPE	VT_I2	Read	Faceplate type (value of MSDD block S18).
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
DISC_ACT	VT_BOOL	Read	Alarm active indicator.
OUT	VT_BOOL	Read	Discrete output value of Bailey MSDD first control output signal.
MODE	VT_I2	Read/Write	The mode of the Bailey block. MODE can be: 0 – Manual 1 – Auto
RED_CMD	VT_BSTR	Read/Write	Red tag command (see red tag users section).
RED_TAG	VT_BOOL	Read	Red tag indicator (0 – no, 1 – yes).
RED_USERS	VT_BSTR	Read	Red tag users (current user names or codes).
F1	VT_BOOL	Read	State of feedback number 1.
F1_TEXT	VT_BSTR	Read	State of feedback number 1 as a string.
F2	VT_BOOL	Read	State of feedback number 2.
F2_TEXT	VT_BSTR	Read	State of feedback number 2 as a string.
F3	VT_BOOL	Read	State of feedback number 3.
F3_TEXT	VT_BSTR	Read	State of feedback number 3 as a string.
F4	VT_BOOL	Read	State of feedback number 4.
F4_TEXT	VT_BSTR	Read	State of feedback number 4 as a string.
GOOD_STATE	VT_I4	Read	Good state (see note 1).
GS_TEXT	VT_BSTR	Read	Good state as a string.
REQ_STATE	VT_I4	Read/Write	Requested state (see note 1).

RS_TEXT	VT_BSTR	Read/Write	Requested state as a string (see note 2).
TRAVEL	VT_BOOL	Read	Travel indicator (see note 3).
OVR_CONTROL	VT_BOOL	Read	Override control indicator.
OVR_STATUS	VT_BOOL	Read	Override status indicator.

Notes:

1.) The GOOD_STATE and REQ_STATE (requested state) attributes are used to view current operating state of the block and command its requested state. Valid values are: (zero = default, one = state 1, two = state 2, and three = state 3). Writing any of these values to REQ_STATE commands the MSDD to that associated state. If the controller MSDD block has pulsed outputs enabled (S22 non-zero), the REQ_STATE will automatically reset to the default state (0) when the pulsed outputs return to the default state. This feature can be disabled by turning off the OPC90 Device block “MSDD Pulse Out Handling” property.

2.) Text strings can be written to this tag to control the MSDD requested state. Valid text strings are the GSLSD0, GSLSD1, GSLSD2 and GSLSD3 settings along with “Default”, “0”, “1”, “2”, “3”, “State 0”, “State 1”, “State 2”, “State 3”, “State0”, “State1”, “State2” and “State3”. Writing any of these strings is case insensitive.

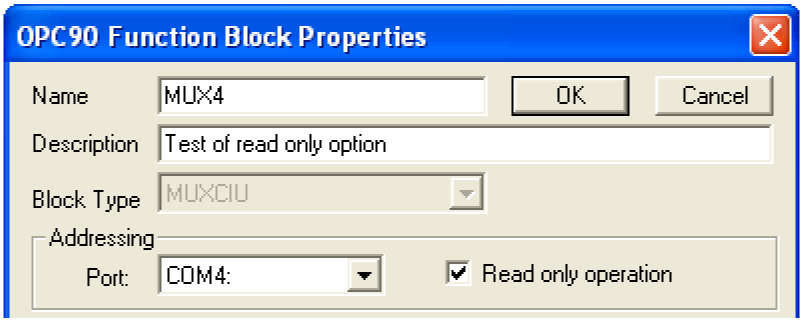
3.) Travel indicator is not actually received from Bailey but composed by the driver for display indication purposes. It is set for the interval of time between commanding a new requested state and waiting for the good state to arrive at the requested state while no alarm has been flagged by the Bailey MSDD block.

7.17 Multiplex CIU (MUXCIU)

The MUXCIU OPC90 block allows a configuration utility program, requiring communication access to the Bailey system, to share the CIU device associated with the OPC90 DEVICE block. This block does not support programs that need to establish points in the CIU. Use this block to allow the Bailey CADEWS or Composer software to communicate with the Bailey system via the OPC90 DEVICE block driver.

To accomplish this task, connect a RS232 serial cable between the COM port specified by the MUXCIU PORT attribute and the COM port to which the configuration utility program expects the Bailey CIU interface to be attached. Note that this connection must be made with a null modem cable. The MUXCIU block receives CIU commands sent by the configuration utility program via the assigned serial port. It channels those commands to the Bailey system through the OPC90 DEVICE block driver. The CIU reply is then returned to the configuration utility program via the assigned serial port. All commands not associated with points established in the Bailey interface are supported.

Configuration of this block includes an option that filters commands that make changes in the ABB Bailey DCS. This option can be enabled by clicking on the “Read only operation” as shown by the following block properties dialog.



Name: MUX4
Description: Test of read only option
Block Type: MUXCIU
Addressing
Port: COM4:
☑ Read only operation

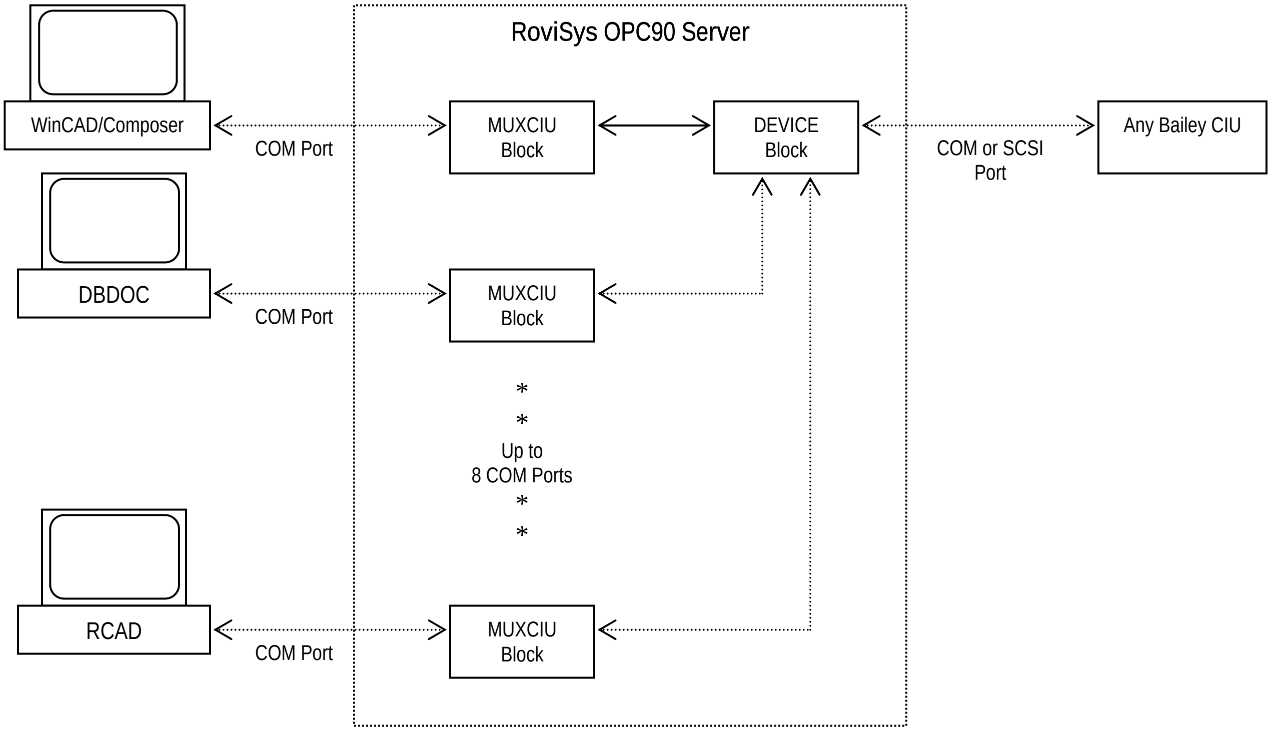
This option should be enabled when using this block with DBDOC. Do not enable it when using with Bailey CADEWS or Composer software.

Commands that would be detrimental to the operation of OPC90 communication with the Bailey interface are handled directly by the MUXCIU block. For example, a common command that a configuration utility program typically sends upon initially starting up, is the CIU RESTART command. The MUXCIU block intercepts this command and does not actually send it to the OPC90 DEVICE driver. Instead it simply returns the response originally received when the OPC90 DEVICE block driver had previously sent the CIU RESTART command. The MUXCIU block has attributes to monitor communication health and statistics. Italicized names indicate attributes configured within the OPC90 Server, which cannot be connected to via OPC.

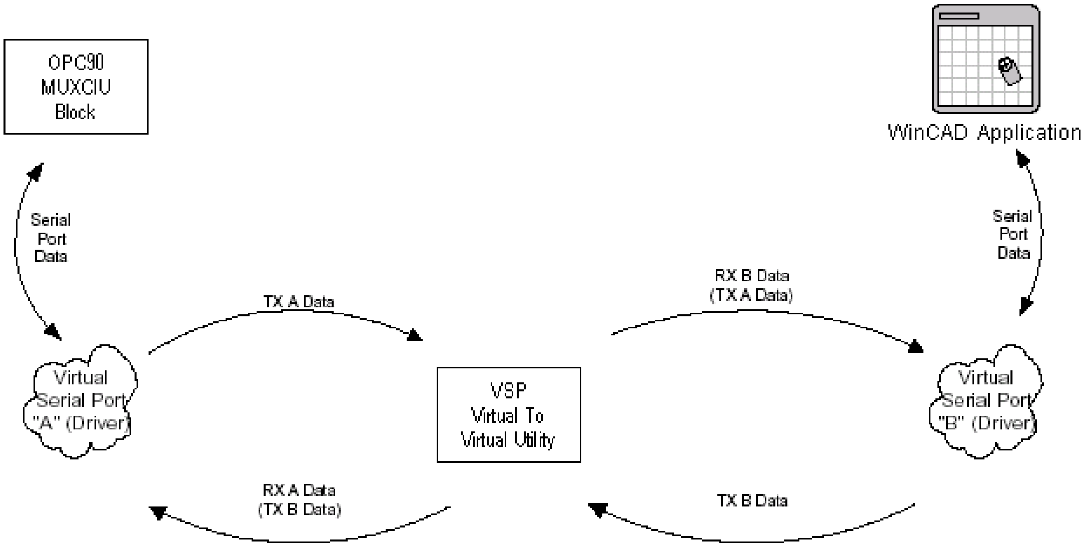
Restrictions: None.

TAGNAME	TYPE	ACCESS	DESCRIPTION
Port	VT_BSTR	Config	Name of the COM port to be multiplexed as a CIU port.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
COMM_STATUS	VT_I4	Read	Communication channel status. A value of zero indicates good and one means bad.
MSG_TOTAL	VT_I4	Read	Running count of total messages being exchanged with the external Bailey configuration software.
MSG_RATE	VT_I4	Read	Messages per second being exchanged with the external Bailey configuration software.
NAK_TOTAL	VT_I4	Read	Running count of total negative acknowledgments sent to the external Bailey configuration software.

The following diagram shows the logical connections when utilizing the MUXCIU block.



When applications that need to share the Bailey interface are running on the same PC as OPC90, it may be possible to utilize a virtual serial port product (VSP). VSP products set up virtual serial ports that can be logically connected, thus avoiding the need to add physical serial ports. The following diagram shows the VSP virtual connections.



To find a VSP product do a Google search for “Virtual Serial Port”.

The following table lists most of the Bailey interface commands supported by the MUXCIU block. All other commands not supported or listed in this table will receive a “Command Not Supported” (NAK-3) response. When the “Read only operation” option is enabled, commands that cause changes in the ABB Bailey DCS will not be sent to the CIU and a “Command Not Supported” (NAK-3) response will be generated.

Command	Command Code	Response
RE-READ REPLY	9	Resends the last command response.
MODULE OPERATION	12	ACK/NAK code indicating requested result.
READ BLOCK	13	Returns requested block data.
READ NEXT BLOCK	14	Returns next block requested block data.
READ DEFAULT BLOCK	15	Returns default block data.
WRITE BLOCK	16	ACK/NAK code indicating requested result.
TUNE BLOCK	17	ACK/NAK code indicating requested result.
DELETE BLOCK	18	ACK/NAK code indicating requested result.
READ BLOCK OUTPUT	20	Returns value of requested block output.
READ PROBLEM REPORT	26	Returns requested problem report data.
DEMAND MODULE STATUS	27	Returns requested module status.
READ EXTENDED PROBLEM REPORT	46	Returns requested extended problem report data.
TREND DATA POLL	48	Returns requested trend block data.
CIU RESTART	19	Returns response from when OPC90 DEVICE block driver originally issuing this command.
READ WORK FLAG	34	Always return ACK and flags indicating no additional work is required.
ENVIRONMENT	69	Returns response from when OPC90 DEVICE block driver originally issuing this command.
READ SYSTEM TIME/DATE	43	Returns requested time/date response. Time Stamp and Wall Clock offset are always zero.
SET SYSTEM TIME/DATE	60	Always returns a ACK response.
DEQUEUE	25	Always returns a ACK response.
CIU CALLUP	41	Always returns a ACK response.
CIU HANGUP	42	Always returns a ACK response.
CIU ONLINE / OFFLINE	44	Always returns a ACK response.
CANCEL KEY COMMAND	50	Always returns a ACK response.
DEFINE SYSTEM NODE	61	Always returns a ACK response.

7.18 Output Device Driver (ODD)

The ODD OPC90 block interfaces with Bailey consoles as a Bailey Device Driver block (function code 123). Note that this block does not received data from a DD block running in a Bailey controller. Use the OPC90 DD block for that purpose. The ODD is used to indicate on/off control of a discrete device with one or two feedback signals. The operating mode of the device can be reported as auto (controlled by logic) or manual (under operator control).

Restrictions: This OPC block can be utilized with all Bailey interface types except CIU01, serial port module (SPM, CPM02 & CPM03) and computer interface command series (CIC).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey CIU ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey CIU node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey CIU module address.
ADDR_BLOCK	VT_I2	Config/Read	Block number to establish this point at within the Bailey interface (see note 1).
DD_TYPE	VT_I2	Config/Read	Bailey DD type code to use when establishing this point (see note 2).
MAX_TIME	VT_I4	Config/Read	If OUT never changes, it will be reported at the maximum time interval (seconds) defined by this attribute.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read/Write	Current quality (see note 3) of Bailey values (0-good, 1-bad).
MODE	VT_I2	Read/Write	Mode of this control loop expressed as 0 – Manual, 1 – Auto.
OUT	VT_BOOL	Read/Write	Value of discrete output.
RED_TAG	VT_BOOL	Read/Write	Device red tag indicator.
ALARM	VT_BOOL	Read/Write	Indicates alarm condition.
F1	VT_BOOL	Read/Write	Current state of first feedback signal.
F2	VT_BOOL	Read/Write	Current state of second feedback signal.
FB_STATUS	VT_BOOL	Read/Write	Current state of feedback status 0 – good, 1 - bad.
OVR_STATUS	VT_BOOL	Read/Write	Current state of override status condition.

1.) Make sure the block number attribute is unique with respect to the other AOL, DOL, ODD, ORCM, ORMC, ORMSC and OSTN OPC90 blocks associated with the same OPC90 DEVICE block. The block number attribute must also be defined within the range of 1 to maximum number of allowed outputs set up within the associated OPC90 DEVICE block. The Bailey system will receive data from this block at the ring and node address of the Bailey CIU interface, module two and block number defined by the block attribute.

2.) The DD type code is a number used by the Bailey consoles to identify characteristics of its DD faceplate display. Currently a value of zero is the only valid code.

3.) When the Device block “Set bad quality of max exception timeout” property is enabled, the QUALITY tag of this block will be set bad if writes to the block input(s) do not occur within the Exception Report Output Max Time setting of the block. When this occurs, bad quality will also be written to the CIU and therefore propagated to the users of the block data within the ABB Bailey system. The quality can also be set bad by writing a one (1) to this tag.

Application: The OUT tag reports the state of the device as off (0) or on (1). The RED_TAG tag allows the client to indicate the device is currently under a red tag condition. This block supports mode. When in auto mode, logic controls the state of the OUT tag, therefore, operator commands are ignored. In manual mode the operator writes the requested state of OUT. OPC90 will receive the write request from the Bailey system and transfer this request to the client by writing the new requested state to the OUT tag. When a state change occurs, the client must update the feedback tags (F1 and F2) to reflect successful arrival of the device at the requested state. If feedback cannot be confirmed, the client must set the ALARM tag. Likewise, the client must reset the ALARM flag when a new device state transition is requested and only set it again if feedback cannot be confirmed. The Bailey implementation of the DD block defines the required states of the feedback signals for the device off and on condition and has a feedback wait time. This is the amount of time to wait for feedback confirmation for the commanded state. Therefore, a delay in the setting of the ALARM tag by the client when feedback is not confirmed is acceptable. The client must also set the ALARM tag if good feedback for the current state is lost sometime after it had been confirmed. The FB_STATUS tag gives an immediate indication as to whether the current state of the feedback signals matches the device state indicated by OUT. The FB_STATUS tag is similar to the ALARM tag but without the associated feedback waiting time. In other words, the client uses the FB_STATUS tag as a cycle to cycle indication that the feedback signals match or do not match the device state indicated by OUT. The ALARM tag indicates a mismatch condition only after a feedback waiting time expires after the device transition. The Bailey DD block logic includes a condition in which feedback status is essentially ignored and always considered good regardless of its actual state in comparison to the OUT tag. The client indicates this condition by setting the OVR_STATUS tag.

7.19 Output Multi-State Device Driver (OMSDD)

The OMSDD OPC90 block interfaces with Bailey consoles as a Bailey Multi-State Device Driver block (function code 129). Note that this block does not received data from a MSDD block running in a Bailey controller. Use the OPC90 MSDD block for that purpose. The OMSDD is used to indicate multiple state control of discrete devices having up to four runtime states reported by up to four feedback signals. The operating mode of the device can be reported as auto (controlled by logic) or manual (under operator control).

Restrictions: This OPC block can be utilized with all Bailey interface types except CIU01, serial port module (SPM, CPM02 & CPM03) and computer interface command series (CIC).

TAGNAME	**TYPE**	**ACCESS**	**DESCRIPTION**
ADDR_RING	VT_I2	Config/Read	Bailey CIU ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey CIU node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey CIU module address.
ADDR_BLOCK	VT_I2	Config/Read	Block number to establish this point at within the Bailey interface (see note 1).
MSDD_TYPE	VT_I2	Config/Read	Bailey MSDD type code to use when establishing this point (see note 2).
MAX_TIME	VT_I4	Config/Read	If OUT never changes, it will be reported at the maximum time interval (seconds) defined by this attribute.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read/Write	Current quality (see note 3) of Bailey values (0-good, 1-bad).
MODE	VT_I2	Read/Write	Mode of this control loop expressed as 0 – Manual, 1 – Auto.
RED_TAG	VT_BOOL	Read/Write	Device red tag indicator.
GOOD_STATE	VT_I2	Read/Write	Current good state (see note 4).
REQ_STATE	VT_I2	Read/Write	Current requested state (see note 4).
OUT	VT_BOOL	Read/Write	Value of discrete output.
ALARM	VT_BOOL	Read/Write	Indicates alarm condition.
F1	VT_BOOL	Read/Write	Current state of first feedback signal.
F2	VT_BOOL	Read/Write	Current state of second feedback signal.
F3	VT_BOOL	Read/Write	Current state of third feedback signal.
F4	VT_BOOL	Read/Write	Current state of fourth feedback signal.
OVR_CONTROL	VT_BOOL	Read/Write	Current state of control override.
OVR_STATUS	VT_BOOL	Read/Write	Current state of override status condition.

1.) ORCM, ORMC, ODD and OMSDD OPC90 blocks associated with the same OPC90 DEVICE block. The block number attribute must also be defined within the range of 1 to maximum number of allowed outputs set up within the associated OPC90 DEVICE block. The Bailey system will receive data from this block at the ring and node address of the Bailey CIU interface, module two and block number defined by the block attribute.

2.) The MSDD type code is a number used by the Bailey consoles to identify characteristics of its MSDD faceplate display. Currently a value of zero is the only valid code.

3.) When the Device block “Set bad quality of max exception timeout” property is enabled, the QUALITY tag of this block will be set bad if writes to the block input(s) do not occur within the Exception Report Output Max Time setting of the block. When this occurs, bad quality will also be written to the CIU and therefore propagated to the users of the block data within the ABB Bailey system. The quality can also be set bad by writing a one (1) to this tag.

4.) The GOOD_STATE and REQ_STATE tags are used to indicate the actual (GOOD_STATE) state of the device and its last requested state (REQ_STATE). The states are indicated as numbers in the range of 0 through 3. By definition, the zero state is considered the default or safe state of the device. States 1 through 3 are considered the operational states of a device like slow, medium and fast. An operator request to go to a given state is written to the REQ_STATE tag. Writing the REQ_STATE tag value to the GOOD_STATE tag value indicates arriving at the requested state. The two tags not being equal and the ALARM tag not being set indicate a travel condition.

Application: The Bailey implementation of the MSDD block contains three discrete outputs used as control signals to a field device typically having more than two states. For example a variable speed motor might have a stopped, slow, medium and fast states. By definition, the MSDD has four device states. These states are the default condition and states one through three. Setup of the MSDD block defines the output values of the three discrete outputs for each of the four device states. For example the default state typically defines the three outputs to be reset, state one could be the first output set and the other two reset and state 3 might be all three outputs are set. For compatibility with the Bailey exception report format this block has an OUT tag, which reports the output value of the first of the three discrete outputs. This output is essentially useless for determining the actual device state but is included for compatibility with existing Bailey implementation. Instead, the Bailey console uses the GOOD_STATE and REQ_STATE tags to determine the actual device state and its new requested state. The client writes the actual device state to the GOOD_STATE tag as a number 0 – 3. A request for a new device state occurs by a write to the REQ_STATE tag. The RED_TAG tag allows the client to indicate the device is currently under a red tag condition. This block supports mode. When in auto mode, logic (the client) controls the state change requests written to the REQ_STATE tag with operator commands to this tag being ignored. In manual mode the operator writes the REQ_STATE tag. OPC90 will receive the write request from the Bailey system and transfer this request to the client by writing the new requested state to the REQ_STATE tag. When the client detects a state change has been requested (GOOD_STATE <> REQ_STATE), the client must update the feedback tags (F1 through F4) and GOOD_STATE tag to reflect successful arrival of the device at the requested state. If feedback cannot be confirm, the client must set the ALARM tag and leave the GOOD_STATE unmodified. Likewise, the client must reset the ALARM flag when a new device state transition is requested and only set it again if feedback cannot be confirmed. The Bailey implementation of the MSDD block defines the required states of the feedback signals for the four possible device states along with a feedback wait time. The feedback wait time is the amount of time to wait before doing feedback confirmation for the requested new state. Therefore, a delay in the setting the ALARM tag, by the client when feedback is not confirmed is acceptable. The client must also set the ALARM tag if good feedback for the current state is lost sometime after it had been confirmed. The Bailey MSDD block includes a feature that allows a block input to cause a control override condition. This condition overrides operator control, transferring control to logic even when the mode is manual. (Options are available in the MSDD to also transfer the mode to auto when the override control input sets.) The client must indicate the override condition by setting the OVR_CONTROL tag. The Bailey MSDD block logic includes another condition in which feedback status is essentially ignored and always considered good regardless of its actual state in comparison to the OUT tag. The client indicates this condition by setting the OVR_STATUS tag.

7.20 Output Remote Control Memory (ORCM)

The ORCM OPC90 block interfaces with Bailey consoles as a Remote Control Memory block (function code 62). Note that this block does not received data from a RCM block running in a Bailey controller. Use the OPC90 RCM block for that purpose. The ORCM is used to indicate on/off control of a simple discrete device with a single feedback signal.

Restrictions: This OPC block can be utilized with all Bailey interface types except CIU01, serial port module (SPM, CPM02 & CPM03) and computer interface command series (CIC).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey CIU ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey CIU node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey CIU module address.
ADDR_BLOCK	VT_I2	Config/Read	Block number to establish this point at within the Bailey interface (see note 1).
ADDR_RING	VT_I2	Config/Read	Bailey CIU ring address.
RCM_TYPE	VT_I2	Config/Read	Bailey RC, type code to use when establishing this point (see note 2).
MAX_TIME	VT_I4	Config/Read	If OUT never changes, it will be reported at the maximum time interval (seconds) defined by this attribute.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read/Write	Current quality (see note 3) of Bailey values (0-good, 1-bad).
OUT	VT_BOOL	Read/Write	Value of discrete output.
RED_TAG	VT_BOOL	Read/Write	Device red tag indicator.
ALARM	VT_BOOL	Read/Write	Indicates alarm condition.
F1	VT_BOOL	Read/Write	Current state of feedback signal.
SET_PERM	VT_BOOL	Read/Write	Set permissive (see note 4).
SET_INPUT	VT_BOOL	Read/Write	Indicates state of set input.
RESET_INPUT	VT_BOOL	Read/Write	Indicates state of reset input.
OVR_STATUS	VT_BOOL	Read/Write	Indicates override status condition.

1.) Make sure the block number attribute is unique with respect to the other AOL, DOL, ODD, ORCM, ORMC, ORMSC and OSTN OPC90 blocks associated with the same OPC90 DEVICE block. The block number attribute must also be defined within the range of 1 to maximum number of allowed outputs set up within the associated OPC90 DEVICE block. The Bailey system will receive data from this block at the ring and node address of the Bailey CIU interface, module two and block number defined by the block attribute.

2.) The RCM type code is a number used by the Bailey consoles to identify characteristics of its RCM faceplate display. Valid codes can be the sum of: 1 – Output value not displayed, 2 – Feedback signal to be displayed.

3.) When the Device block “Set bad quality of max exception timeout” property is enabled, the QUALITY tag of this block will be set bad if writes to the block input(s) do not occur within the Exception Report Output Max Time setting of the block. When this occurs, bad quality will also be written to the CIU and therefore propagated to the users of the block data within the ABB Bailey system. The quality can also be set bad by writing a one (1) to this tag.

4.) SET_PERM will default to a value of set. The OPC Client can disable the ability of Bailey consoles to set the OUT tag by resetting the value of SET_PERM.

Application: The OUT tag reports the state of the device as off (0) or on (1). The RED_TAG tag allows the client to indicate the device is currently under a red tag condition. This block does not support mode. It is always considered to be in manual mode. Both operators and logic can simultaneously control this block. The operator is allowed to command the OUT tag set when the SET_PERM tag has been set by the client. OPC90 will receive the write request from the Bailey system and transfer this request to the client by writing the new requested state to the OUT tag. When a state change occurs, the client must update the F1 (feedback) tag to reflect successful arrival of the device at the requested state. F1 must be set when OUT is set and F1 is reset when OUT is reset. The client must set the ALARM tag to indicate the feedback does not agree with the requested device state. Likewise, the client must reset the ALARM flag when a new device state transition is requested and only set it again if feedback cannot be confirmed. The client reports the state of the set and reset logic inputs using the respective SET_INPUT and RESET_INPUT tags. The Bailey RCM block includes a feature that allows a block input to control the output value based on the occurrence of a control override condition. This condition occurs when the SET_PERM, SET_INPUT and RESET_INPUT tags are all in the set state. The client indicates the override state condition by setting the OVR_STATUS tag.

7.21 Output Remote Motor Control (ORMC)

The ORMC OPC90 block interfaces with Bailey consoles as a Remote Motor Control block (function code 136). Note that this block does not received data from a RMC block running in a Bailey controller. Use the OPC90 RMC block for that purpose. The ORMC is used to indicate on/off control of a discrete device with interlock signals, up to two reported start permissive signals and up to two reported feedback signals. It also reports bad start conditions due to lack of proper interlock signals and a fault condition upon loss of feedback signals after the device is enabled.

Restrictions: This OPC block can be utilized with all Bailey interface types except CIU01, serial port module (SPM, CPM02 & CPM03) and computer interface command series (CIC).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey CIU ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey CIU node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey CIU module address.
ADDR_BLOCK	VT_I2	Config/Read	Block number to establish this point at within the Bailey interface (see note 1).
RMC_TYPE	VT_I2	Config/Read	Bailey RMC type code to use when establishing this point (see note 2).
MAX_TIME	VT_I4	Config/Read	If OUT never changes, it will be reported at the maximum time interval (seconds) defined by this attribute.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read/Write	Current quality (see note 3) of Bailey values (0-good, 1-bad).
OUT	VT_BOOL	Read/Write	Value of discrete output.
RED_TAG	VT_BOOL	Read/Write	Device red tag indicator.
ALARM	VT_BOOL	Read/Write	Indicates alarm condition.
F1	VT_BOOL	Read/Write	Current state of first feedback signal.
F2	VT_BOOL	Read/Write	Current state of second feedback signal.
PERM1	VT_BOOL	Read/Write	Current state of first start permissive signal.
PERM2	VT_BOOL	Read/Write	Current state of second start permissive signal.
BAD_START	VT_BOOL	Read/Write	Indicates a bad start condition.
FAULT	VT_BOOL	Read/Write	Indicates a fault has occurred.
ERR_CODE	VT_I2	Read/Write	Indicates error code for bad start and fault conditions (see note 4).
HOLD_STATUS	VT_BOOL	Read/Write	Indicates control status holding state due to an ALARM or FAULT condition.
FAULT_ACK	VT_BOOL	Read/Write	Fault acknowledgment.

1.) Make sure the block number attribute is unique with respect to the other AOL, DOL, ODD, ORCM, ORMC, ORMSC and OSTN OPC90 blocks associated with the same OPC90 DEVICE block. The block number attribute must also be defined within the range of 1 to maximum number of allowed outputs set up within the associated OPC90 DEVICE block.

The Bailey system will receive data from this block at the ring and node address of the Bailey CIU interface, module two and block number defined by the block attribute.

2.) The RMC type code is a number used by the Bailey consoles to identify characteristics of its RCM faceplate display. Currently a value of zero is the only valid code.

3.) When the Device block “Set bad quality of max exception timeout” property is enabled, the QUALITY tag of this block will be set bad if writes to the block input(s) do not occur within the Exception Report Output Max Time setting of the block. When this occurs, bad quality will also be written to the CIU and therefore propagated to the users of the block data within the ABB Bailey system. The quality can also be set bad by writing a one (1) to this tag.

4.) The RMC ERR_CODE codes are defined as: 0 – no error, 1 – stopped by logic, 2 – interlock one is not set, 3 – interlock two is not set, 4 – interlock three is not set, 5 – interlock four is not set, 6 – feedback one is not reset, 7 – feedback two is not reset, 8 – feedback one is set, 9 feedback two is set. The appropriate error code must be written when a bad start or fault condition occurs.

Application: The OUT tag reports the state of the device as off (0) or on (1). This block does not support mode. The RED_TAG tag allows the client to indicate the device is currently under a red tag condition. It is always considered to be in manual mode and under both logic and operator control. Before a device can be commanded to the on state its four interlock inputs and two start permissive inputs must all be set. The interlock inputs are implied to the block operation but are not reported to the Bailey consoles. The start permissive inputs are reported. The client indicates their state using the PERM1 and PERM2 tags. When the device is commanded on without the interlocks or permissive inputs being set, this is considered a bad start. The client indicates a bad start condition using the BAD_START tag. A bad start can also occur when the feedback signals do not set after the device has been commanded on and a feedback waiting time has expired. The client must also indicate this condition as a bad start using the BAD_START tag. The client indicates the two feedback signals writing to the F1 and F2 tags. If any interlock or feedback signals are lost after a successful start, the device is considered to be in fault and de-energized. The client indicates this condition by writing a zero to the OUT tag and setting the FAULT tag. When either a bad start or fault condition occurs, the client must use the ERR_CODE tag to indicate the reason for the condition. Bailey predefines the error codes as indicated in the above note concerning the ERR_CODE tag. The Bailey implementation of the RMC block defines a hold condition that optionally applies when a bad start arises. The choices are no hold, hold bad start and error indicators until successful start or hold but reset bad start and error indicators on next stop or start request. The client indicates the hold condition by setting the HOLD_STATUS tag. It should be reset on the next start request. The client uses the FAULT_ACK tag to indicate a fault has occurred and receive an acknowledgment of that fault when the Bailey console writes a value of zero to FAULT_ACK.

7.22 Output Remote Manual Set Constant (ORMSC)

The ORMSC OPC90 block interfaces with Bailey consoles as a Remote Manual Set Constant block (function code 68). Note that this block does not received data from a RMSC block running in a Bailey controller. Use the OPC90 RMSC block for that purpose. The ORMSC is used to indicate an operator settable analog set point value. Operators can only write set point values to this block within the range specified by its attributes. A set point track indicator indicates logic determination of the set point value.

Restrictions: This OPC block can be utilized with all Bailey interface types except CIU01, serial port module (SPM, CPM02 & CPM03) and computer interface command series (CIC).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey CIU ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey CIU node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey CIU module address.
ADDR_BLOCK	VT_I2	Config/Read	Block number to establish this point at within the Bailey interface (see note 1).
EU_CODE	VT_I2	Config/Read	Bailey engineering units code to use when establishing this point (see note 2).
ZERO	VT_R4	Config/Read	Zero of SP value in engineering units.
SPAN	VT_R4	Config/Read	Span of SP value in engineering units.
SIG_CHANGE	VT_R4	Config/Read	Amount that SP must change, cycle to cycle before it will be reported to Bailey. Expressed as a percentage of the SPAN.
MAX_TIME	VT_I4	Config/Read	If SP never changes significantly, it will be reported at the maximum time interval (seconds) defined by this attribute.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read/Write	Current quality (see note 3) of Bailey values (0-good, 1-bad).
SP	VT_R4	Read/Write	Set point.
SP_TRACKING	VT_BOOL	Read/Write	Indicates set point tracking when set.

1.) Make sure the block number attribute is unique with respect to the other AOL, DOL, ODD, ORCM, ORMC, ORMSC and OSTN OPC90 blocks associated with the same OPC90 DEVICE block. The block number attribute must also be defined within the range of 1 to maximum number of allowed outputs set up within the associated OPC90 DEVICE block. The Bailey system will receive data from this block at the ring and node address of the Bailey CIU interface, module two and block number defined by the block attribute.

2.) The engineering units code is a number used by the Bailey consoles to index into a table of text strings representing the engineering units of the set point value.

3.) When the Device block “Set bad quality of max exception timeout” property is enabled, the QUALITY tag of this block will be set bad if writes to the block input(s) do not occur within the Exception Report Output Max Time setting of the block. When this occurs, bad quality will also be written to the CIU and therefore propagated to the users of the block data within the ABB Bailey system. The quality can also be set bad by writing a one (1) to this tag.

Application: The client uses the SP tag to report the current block value. The operator is allowed to command the SP to a new value as long as the SP_TRACKING tag is not set. OPC90 will receive the write request from the Bailey system and transfer it to the client by writing the new requested value to the SP tag. The client is responsible for indicating set point tracking by setting the SP_TRACKING tag. While in SP_TRACKING the client also updates the SP tag to the currently tracked value. Updates to the SP tag will be constrained between the configured set point zero and span.

7.23 Output Station Control (OSTN)

The OSTN OPC90 block interfaces with Bailey consoles as a Bailey Station block (function codes 21, 22, 23, & 80). Note that this block does not received data from a STN block running in a Bailey controller. Use the OPC90 STN block for that purpose. The OSTN is used to indicate control of an analog PID control loop. The operating mode of the PID control loop can be reported as manual (operator writes the set point and control output values), auto (operator writes the set point value with the control output calculated by the PID algorithm) or cascade (logic determines the set point value with the control output calculated by the PID algorithm).

Restrictions: This OPC block can be utilized with all Bailey interface types except CIU01, serial port module (SPM, CPM02 & CPM03) and computer interface command series (CIC). The other Bailey interfaces do not support being the source of PID tuning parameters. Therefore, PID loop tuning of this point from Bailey consoles is not possible.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey CIU ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey CIU node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey CIU module address.
ADDR_BLOCK	VT_I2	Config/Read	Block number to establish this point at within the Bailey interface (see note 1).
EU_CODE	VT_I2	Config/Read	Bailey engineering units code to use when establishing this point (see note 2).
STN_TYPE	VT_I2	Config/Read	Bailey station type code to use when establishing this point (see note 3).
ZERO	VT_R4	Config/Read	Zero of PV and SP values in engineering units.
SPAN	VT_R4	Config/Read	Span of PV and SP values in engineering units.
SIG_CHANGE	VT_R4	Config/Read	Amount that PV or SP must change, cycle to cycle before it will be reported to Bailey. Expressed as a percentage of the SPAN.
MAX_TIME	VT_I4	Config/Read	If PV, SP or OUT never changes significantly, it will be reported at the maximum time interval (seconds) defined by this attribute.
HI_LIM	VT_R4	Config/ Read/Write	The setting for the process variable alarm limit used to derive the high alarm condition (see note 4).
LO_LIM	VT_R4	Config/ Read/Write	The setting for the process variable alarm limit used to derive the low alarm condition (see note 4).
DV_LIM	VT_R4	Config/ Read/Write	The setting for the deviation alarm limit between the process variable and set point used to derive the deviation alarm condition (see note 4).
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.

QUALITY	VT_BOOL	Read/Write	Current quality (see note 5) of Bailey values (0-good, 1-bad).
HI_ACT	VT_BOOL	Read	PV High alarm active indicator (see note 6).
LO_ACT	VT_BOOL	Read	PV Low alarm active indicator (see note 6).
DV_HI_ACT	VT_BOOL	Read	High deviation alarm active indicator (see note 6).
DV_LO_ACT	VT_BOOL	Read	Low deviation alarm active indicator (see note 6).
MODE	VT_I2	Read/Write	Mode of this control loop expressed as 0 – Manual, 1 – Auto, 2 – Cascade.
MODE_LOCK	VT_BOOL	Read/Write	Indicates locked into current mode when set.
PV	VT_R4	Read/Write	Process variable.
OUT	VT_R4	Read/Write	Control output (range is limited to –5.0 to 105.0).
OUT_TRACKING	VT_BOOL	Read/Write	Indicates output tracking when set.
RED_TAG	VT_BOOL	Read/Write	Device red tag indicator.
SP	VT_R4	Read/Write	Set point.
SP_TRACKING	VT_BOOL	Read/Write	Indicates set point tracking when set.
RI	VT_R4	Read/Write	Ratio index (only used for ratio station types).
AO_BYPASS	VT_BOOL	Read/Write	Indicates analog output bypass when set.
DS_BAD	VT_BOOL	Read/Write	Indicates bad digital control station (Bailey hard DCS station) when set.

1.) Make sure the block number attribute is unique with respect to the other AOL, DOL, ODD, ORCM, ORMC, ORMSC and OSTN OPC90 blocks associated with the same OPC90 DEVICE block. The block number attribute must also be defined within the range of 1 to maximum number of allowed outputs set up within the associated OPC90 DEVICE block. The Bailey system will receive data from this block at the ring and node address of the Bailey CIU interface, module two and block number defined by the block attribute.

2.) The engineering units code is a number used by the Bailey consoles to index into a table of text strings representing the engineering units of the process variable and set point values.

3.) The station type code is a number used by the Bailey consoles to identify characteristics of its station faceplate display. Valid codes are: 1 – Basic with SP, 2 – Ratio, 4 – Cascade, 8 – Basic without SP and 16 – Basic with Bias.

4.) This attribute is normally configured when the block is first defined. Since it is associated with the alarm limits of value an OPC Client is permitted to write new alarm limits in run time. Care should be taken to not continuously change the limit value since each change necessitates dis-establishing the point from the ABB Bailey interface and than re-establishing it with the new limit value.

5.) When the Device block "Set bad quality of max exception timeout" property is enabled, the QUALITY tag of this block will be set bad if writes to the block input(s) do not occur within the Exception Report Output Max Time setting of the block. When this occurs, bad quality will also be written to the CIU and therefore propagated to the users of the block data within the ABB Bailey system. The quality can also be set bad by writing a one (1) to this tag.

6.) The alarm active indicators are automatically calculated based on the last process variable and set point value written by the client.

Application: Bailey implements analog control loops as a combination of two function blocks. One block is the actual PID algorithm and the other is called a station block (STN) that handles interaction of the PID control values to Bailey consoles. Typical loop variables such as set point, process variable, control output and mode are involved with this interaction. Bailey also makes available a number of auxiliary values associated with the typical values that are also included in the OSTN implementation. The RED_TAG tag allows the client to indicate the device is currently under a red tag condition. The client reports the mode of the control loop via the MODE tag. Valid modes are manual (0), auto (1) and cascade (2). OPC90 will receive mode write request from the Bailey system and transfer it to the client by writing the new requested mode value to the MODE tag. Bailey logic can lock a control loop into any given mode. The client uses the MODE_LOCK tag to indicate this condition. The PV tag is used by the client to report the process variable of the control loop. This value is in engineering units and will be clamped between the zero and span defined for the process variable. The OUT tag is used by the client to report the current value of the control output. By definition for Bailey systems, OUT has a range of –5.0 to 105.0 that expresses a percentage. OPC90 will receive control output write request from the Bailey system and when the current mode is manual, transfer the control output to the client by writing it to the OUT tag. Bailey logic can enable control output tracking while in manual mode. The client uses the OUT_TRACKING tag to indicate this condition. The SP tag is used by the client to report the current value of the set point. This value is in engineering units and will be clamped between the zero and span defined for the set point. OPC90 will receive set point write request from the Bailey system and when the current mode is manual or auto, transfer the set point to the client by writing it to the SP tag. Bailey logic can enable set point tracking while in manual or auto mode. The client uses the SP_TRACKING tag to indicate this condition. A Bailey STN block can be configured to be a ratio station. Ratio stations are similar to a cascaded loop but differs in its method of set point generation when in cascade mode. The cascaded set point input (wild variable) is multiplied by a ratio adjustment factor (called the ratio index) to determine the actual set point value. The RI tag is used by the client to report the current value of the ratio index. By definition for Bailey systems, the ratio index has a valid range of 0.05 to 10.0. OPC90 will receive ratio index write request from the Bailey system and when the current mode is cascade, transfer the ratio index to the client by writing it to the RI tag. Some older Bailey systems using the station block have also included a “hand held” station called a Digital Control Station that allows plant personnel to take direct control of the loop output. The client uses the AO_BYPASS tag to indicate this condition has occurred. Likewise, the client uses the DS_BAD tag to also indicate that the controller has lost communication with the Digital Control Station hand held station.

7.24 Poll Any Block (POLL)

The POLL OPC90 block is used to retrieve polled output values from any Bailey function block output. This includes blocks that have floating point outputs and discrete outputs. Its primary usage is intended for node level data acquisition when the Bailey interface type is a serial port module, CPM02 or CIC. The POLL block can be used to duplicate the Bailey console ad hoc block output queries. Usage of this block with Bailey interfaces other then serial port modules, CPM or CIC should be limited to those few Bailey block output values not currently being exception reported. Data is obtained by polling. Since Bailey is optimized for exception reporting, polling for Bailey outputs is inefficient and should not be used for a large number of values.

TAGNAME	TYPE	ACCESS	DESCRIPTION
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
ADDR_RING	VT_I2	Config/ Read/Write	Bailey ring address (see note 1).
ADDR_NODE	VT_I2	Config/ Read/Write	Bailey node address (see note 1).
ADDR_MODULE	VT_I2	Config/ Read/Write	Bailey module address (see note 1).
ADDR_BLOCK	VT_I2	Config/ Read/Write	Bailey block address (see note 1).
INTERVAL	VT_I4	Config/ Read/Write	Desired polling interval expressed as milliseconds (see note 1).
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
OUT	VT_R4	Read	The polled Bailey block output value (see note 2).
HI_ACT	VT_BOOL	Read	High alarm active indicator (see note 3).
LO_ACT	VT_BOOL	Read	Low alarm active indicator (see note 3).
HI_DEV_ACT	VT_BOOL	Read	High deviation alarm active indicator (see note 4).
LO_DEV_ACT	VT_BOOL	Read	Low deviation alarm active indicator (see note 4).

Notes:

1.) By writing to these tags, the client can set the address to be polled and how often the value is polled. The server will enforce valid ranges for these tags but it is the client’s responsibility to write valid addresses to which block outputs actually exist. Polling is disabled when the client writes zero to the interval tag. Otherwise, the minimum value that can be written is 100 ms.

2.) Polling discrete Bailey block outputs will be converted to an equivalent floating point value.

3.) Some polled Bailey floating point block outputs also contain high and low alarm active bits. The alarm level of any such polled block will be reflected in the HI_ACT and LO_ACT tags. Some polled Bailey discrete block outputs also contain an alarm active bit. The alarm level of any such polled block will be reflected in the HI_ACT tag.

4.) Some polled Bailey floating point block outputs also contain high and low deviation alarm active bits. The alarm level of any such polled block will be reflected in the HI_DEV_ACT and LO_DEV_ACT attributes.

7.25 Remote Control Memory (RCM)

The RCM OPC90 block is used to retrieve and control the exception reported output from Bailey Remote Control Memory blocks (function code 62).

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
F1LSD0	VT_BSTR	Config/Read	Feedback 1 state zero logic state descriptor.
F1LSD1	VT_BSTR	Config/Read	Feedback 1 state one logic state descriptor.
OUTLSD0	VT_BSTR	Config/Read	Output state zero logic state descriptor.
OUTLSD1	VT_BSTR	Config/Read	Output state one logic state descriptor.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
FACE_TYPE	VT_I2	Read	Faceplate type (value of RCM block S8).
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
DISC_LIM	VT_BOOL	Read	Discrete alarm state.
DISC_ACT	VT_BOOL	Read	Alarm active indicator.
OUT	VT_BOOL	Read/Write	Bailey RCM discrete output value (see note 1).
OUT_TEXT	VT_BSTR	Read/Write	Bailey RCM discrete output value as a string (see note 2).
RED_CMD	VT_BSTR	Read/Write	Red tag command (see red tag users section).
RED_TAG	VT_BOOL	Read	Red tag indicator (0 – no, 1 – yes).
RED_USERS	VT_BSTR	Read	Red tag users (current user names or codes).
F1	VT_BOOL	Read	State of feedback.
F1_TEXT	VT_BSTR	Read	State of feedback number 1 as a string.
SET_PERM	VT_BOOL	Read	Set permissive.
OVR_STATUS	VT_BOOL	Read	Override status indicator.

Notes:

1.) OPC90 uses pulse reset and pulse set commands when commanding the state of the RCM output. When writing a zero to reset the output, a pulse reset command (5) is actually sent to the RCM block by OPC90. Likewise writing one to set the output, a pulse set command (6) is sent. Some older style drivers force the client to sent a 5 and 6 to reset and set the RCM output. For compatibility when converting from such older style drivers to OPC90, it can be configured to also accept values of 5 and 6 for commanding the output reset and set. To enable this ability, the RCM.OUT parameter type must be changed from its default setting of BIT to another multi-bit type such as INT. Right click on the RCM.OUT attribute and select properties to make this change. Note that OPC90 will always report the value of OUT as 0 or 1 regardless of whether it is written as 0, 1, 5 or 6.

2.) Text strings can be written to this tag to control the RCM output. Valid text strings are the OUTLSD0 and OUTLSD1 settings along with “0”, “1”, “5”, “6”, “Off”, “On”, “Reset”, “Set”, “Zero”, “One”, “False” and “True”. Writing any of these strings is case insensitive.

7.26 Remote Motor Control (RMC)

The RMC OPC90 block is used to retrieve and control the exception reported output from Bailey Remote Motor Control blocks (function code 136).

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
F1LSD0	VT_BSTR	Config/Read	Feedback 1 state zero logic state descriptor.
F1LSD1	VT_BSTR	Config/Read	Feedback 1 state one logic state descriptor.
F2LSD0	VT_BSTR	Config/Read	Feedback 2 state zero logic state descriptor.
F2LSD1	VT_BSTR	Config/Read	Feedback 2 state one logic state descriptor.
PERM1LSD0	VT_BSTR	Config/Read	Permissive 1 state zero logic state descriptor.
PERM1LSD1	VT_BSTR	Config/Read	Permissive 1 state one logic state descriptor.
PERM2LSD0	VT_BSTR	Config/Read	Permissive 2 state zero logic state descriptor.
PERM2LSD1	VT_BSTR	Config/Read	Permissive 2 state one logic state descriptor.
OUTLSD0	VT_BSTR	Config/Read	Output state zero logic state descriptor.
OUTLSD1	VT_BSTR	Config/Read	Output state one logic state descriptor.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
FACE_TYPE	VT_I2	Read	Faceplate type (value of RMC block S14).
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
DISC_ACT	VT_BOOL	Read	Alarm active indicator.
OUT	VT_BOOL	Read/Write	The Bailey discrete output value.
OUT_TEXT	VT_BSTR	Read/Write	Bailey RCM discrete output value as a string (see note 1).
RED_CMD	VT_BSTR	Read/Write	Red tag command (see red tag users section).
RED_TAG	VT_BOOL	Read	Red tag indicator (0 – no, 1 – yes).
RED_USERS	VT_BSTR	Read	Red tag users (current user names or codes).
F1	VT_BOOL	Read	State of feedback number 1.
F1_TEXT	VT_BSTR	Read	State of feedback number 1 as a string.
F2	VT_BOOL	Read	State of feedback number 2.
F2_TEXT	VT_BSTR	Read	State of feedback number 2 as a string.
FAULT	VT_BOOL	Read	Fault has occurred indicator.
ERR_CODE	VT_I2	Read	Fault error code (see note 2).
FAULT_ACK	VT_BOOL	Read/Write	Fault acknowledgment (see note 3).
PERM1	VT_BOOL	Read	Permissive #1 indicator.
PERM1_TEXT	VT_BSTR	Read	Permissive #1 indicator as a string.
PERM2	VT_BOOL	Read	Permissive #2 indicator.
PERM2_TEXT	VT_BSTR	Read	Permissive #2 indicator as a string.
BAD_START	VT_BOOL	Read	Bad start indicator.
HOLD_STATUS	VT_BOOL	Read	Status on hold indicator.

Notes:

1.) Text strings can be written to this tag to control the RMC output. Valid text strings are the OUTLSD0 and OUTLSD1 settings along with “0”, “1”, “Off”, “On”, “Reset”, “Set”, “Zero”, “One”, “False” and “True”. Writing any of these strings is case insensitive.

2.) ERR_CODE attribute indicates error codes when a bad start or fault condition arises. The following error codes can be returned:

0 - no error	5 - interlock #4 input
1 - stop input	6 - feedback #1 input is 0
2 - interlock #1 input	7 - feedback #2 input is 0
3 - interlock #2 input	8 - feedback #1 input is 1
4 - interlock #3 input	9 - feedback #2 input is 1

3.) The FAULT_ACK tag should be set true (1) to acknowledge a fault or bad start condition and the Bailey RMC block will reset it to false (0) after acknowledgment is accepted.

7.27 Remote Manual Set Constant (RMSC)

The RMSC OPC90 block is used to retrieve and control the exception reported output from Bailey Remote Manual Set Constant blocks (function code 68).

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

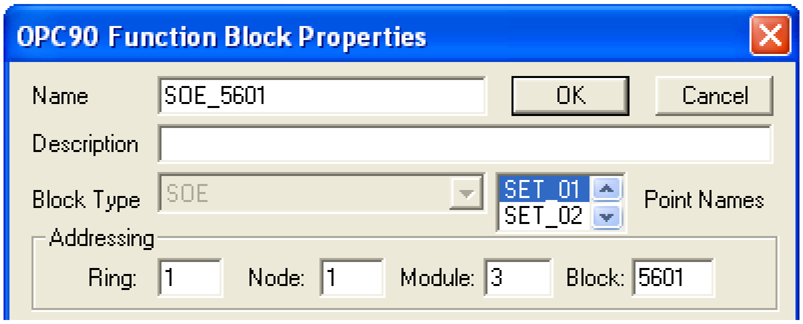
Warning: Do not use a series of these blocks to provide bulk transfer of data between the client and ABB Bailey controller. Instead use the OPC90 AOL block to source the client data and ABB Bailey AI/I (FC 121) or AI/L (FC 26) blocks in the controller to receive the data.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
EU	VT_I2	Read	Engineering Units Code.
EU_TEXT	VT_BSTR	Read	Engineering Units String.
OUT	VT_R4	Read/Write	Current output value received from Bailey.
OUT_HI_LIM	VT_R4	Read	OUT high limit.
OUT_LO_LIM	VT_R4	Read	OUT low limit.
SP_TRACKING	VT_BOOL	Read	Set point is tracking indicator.

7.28 SOE Sequence of Events (SOE)

The SOE OPC90 block is used to monitor and retrieve sequence of events data from Bailey Sequence of Events Log blocks (function codes 99 and 243). OPC90 supports up to four ABB Bailey sequence of events recorders by allowing definition of four SOE point sets. Each point set consists of 512 points. The Edit->SOE Point Names menu selection is used to define the SOE point sets.

Configuration of this block includes selection of the SOE point name set it is to be associated with.



OPC90 Function Block Properties

Name: SOE_5601
Description:
Block Type: SOE
SET_01
SET_02
Point Names

Addressing
Ring: 1
Node: 1
Module: 3
Block: 5601

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
BLOCK_TYPE	VT_BSTR	Read	Type of SOE log block (‘Undefined’, ‘Standard’, ‘Summary’, ‘Pre-fault’, ‘Post-fault’ and ‘Snap-shot’).
QUALITY	VT_BOOL	Read	Current quality of Bailey sequence of events recorder (0-good, 1-bad). A value of 0 indicates good, otherwise the point address is wrong, the Bailey controller is not communicating with the RA-3800 SER or INSEM01 module.
SOE_DATA	VT_BOOL	Read/Write	Indicates whether or not the SOE block has newly captured SOE data present (0 – empty waiting for a capture event, 1 – capturing data).
OFLOW	VT_BOOL	Read	The SOE data overflowed the Bailey SOE block buffer capacity.
COUNT	VT_I4	Read	Total points logged to the currently selected SOE capture file.
EVENT	VT_BOOL	Read/Write	Signals that a SOE event has been captured (0-armed and waiting, 1-captured and locked).

FILE	VT_BSTR	Read/Write	Indicates / selects the current file name for the captured SOE data.
NEXTFILE	VT_BOOL	Read/Write	Flag used to sequence through the most recent to oldest SOE capture files.
NEXTREC	VT_BOOL	Read/Write	Flag used to sequence through the records of the currently selected SOE capture file..
RECORD	VT_I4	Read/Write	Indicates / selects a record (1 – COUNT) for the currently selected capture file.
POINT_TYPE	VT_BSTR	Read	Point type (‘Undefined’, ‘Standard’, ‘Summary’, ‘Pre-fault’, ‘Post-fault’ and ‘Snap-shot’) for current record of selected SOE file.
POINT_NUM	VT_I4	Read	Point number (0 - 511) for current record of selected SOE file.
POINT_NAME	VT_BSTR	Read	Point name for current record of selected SOE file.
POINT_SCAN	VT_BOOL	Read	Point scan state (0 on scan, 1 off scan) for current record of selected SOE file.
POINT_DATE	VT_BSTR	Read	Point capture date month/day/year for current record of selected SOE file.
POINT_TIME	VT_BSTR	Read	Point capture time hour:minute:second.millisecond for current record of selected SOE file.
POINT_Q	VT_BOOL	Read	Point quality (0 good, 1 bad) for current record of selected SOE file.
POINT_ALARM	VT_BOOL	Read	Point alarm state (0 no, 1 yes) for current record of selected SOE file.
POINT_VALUE	VT_BOOL	Read	Point value (0 or 1) for current record of selected SOE file.

Application: This block is used to monitor and retrieve sequence of events data from Bailey function code 99 and 243 blocks. Bailey function code 99 blocks can be any block number within the controller block range. On startup, OPC90 reads the Bailey SOE block data to determine its type (FC 99 or 243) and based on the type setup the OPC90 SOE.BLOCK_TYPE tag. Bailey function code 243 is the INSEM01 executive block. Its base address is always 5000 and is used to retrieve “Standard” sequence of events. Its 5001 block address is used to retrieve “Summary” sequence of events.

The SOE.SOE_DATA tag indicates the Bailey system is capturing an SOE event when it goes to the one state. When this occurs, OPC90 will read the sequence of event data and store it in SOE files automatically generated within the C:\Program Files\OPC90 Server\SOE directory. The SOE.OFLOW tag indicates the Bailey SOE block experienced an overflow condition (when 1) and the block buffer size must be increased to clear this condition.

SOE.SOE_DATA will reset when the SOE event capture is complete. The current capture file can be closed and a new one opened by writing a zero to this tag. Note that a value of one can only be written to the SOE.SOE_DATA tag when the SOE block type is ‘Summary’ requesting a summary report to be generated. If OPC90 device simulation is enabled, a one and then zero can be written regardless of the SOE block type. This will cause a simulated SOE log file to be generated

By definition file names are the system address of the block (ring, node, module, block separated with an underscore character ‘_’) followed by date of capture followed by a two digit (01 – 99) sequence code. The capture file types are ‘STD’, ‘SUM’, ‘PRE’, ‘POS’ or ‘SNP’ which corresponds to standard, summary, pre-fault, post-fault and snapshot type logs. Note that Bailey blocks based on FC 243 generated by the INSEM01 module only support standard and summary type events.

Consider the following examples:

1.) 1_2_3_100_0420200702.STD
2.) 1_2_3_101_0228200701.SUM
3.) 1_2_3_102_0308200701.PRE
4.) 1_2_3_103_0308200701.POS
5.) 1_2_3_104_1225200699.SNP

Example 1 is the 2nd standard SOE log captured on April 20, 2007 by the SOE block at ring 1, node 2, module 3 and block address 100.

Example 2 is the 1st summary SOE log captured on February 28, 2007 by the SOE block at ring 1, node 2, module 3 and block address 101.

Example 3 is the 1st pre-fault SOE log captured on March 8, 2007 by the SOE block at ring 1, node 2, module 3 and block address 102.

Example 4 is the 1st post-fault SOE log captured on March 8, 2007 by the SOE block at ring 1, node 2, module 3 and block address 103.

Example 5 is the 99th snapshot SOE log captured on December 25th, 2006 by the SOE block at ring 1, node 2, module 3 and block address 104.

Note that this naming convention supports up to 99 capture files (a_a_a_a_xxxxxxxx01.STD – a_a_a_a_xxxxxxxx99.STD) for each given log type to be recorded per day. After generation of the 99th log file (a_a_a_a_xxxxxxxx99.STD) it will wrap back around to the beginning (a_a_a_a_xxxxxxxx01.STD). The capture files are stored in the C:\Program Files\OPC90 Server\SOE directory. This directory is also included in the OPC90 database shadowing feature.

The data in the log file is stored in a space separated ASCII format. The first line is a count of the number of SOE records contained by the file. Each subsequent line is a SOE record containing the point number, date string, time string, its quality, alarm state, scan state, value, point type string and point name string. Consider the following example data stored in the file "1_2_3_102_0201200701.PRE":

```
4
1  2/01/2007  23:23:50.120 0 0 0 1 Pre-fault  Pump_A
2  2/01/2007  23:23:50.125 0 0 1 0 Pre-fault  Pump_B
6  2/01/2007  23:23:50.203 0 1 0 1 Pre-fault  Compressor_1
9  2/01/2007  23:23:50.987 1 0 0 0 Pre-fault  Compressor_2
```

The log is the first one to occur on February 1, 2007 for pre-faulted data points. It contains four SOE records as indicated by the first line.

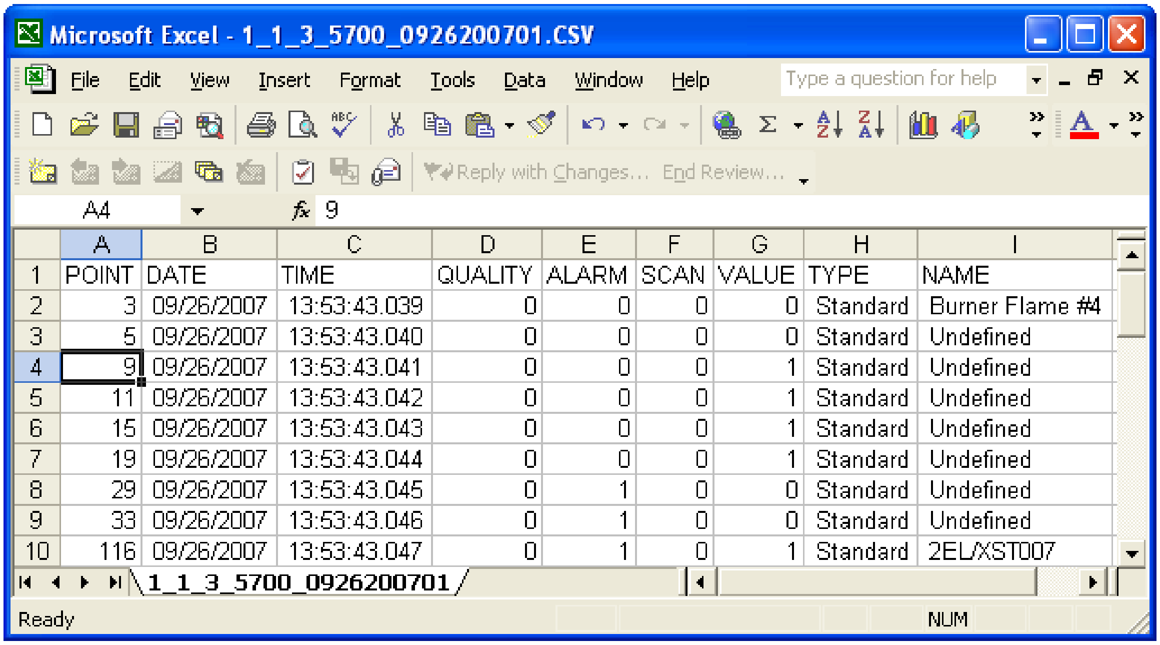
The first record is point #1 which was logged by the Bailey block on February 1, 2007 at 23:23:50.120. It has good quality, its not in alarm, has not been deleted from the scan and has a value of one. The point type is pre-fault and it called "Pump_A".

The second record is point #2 which was logged by the Bailey block on February 1, 2007 at 23:23:50.125. It has good quality, its not in alarm, has been deleted from the scan and has a value of zero. The point type is pre-fault and it called "Pump_B".

The third record is point #6 which was logged by the Bailey block on February 1, 2007 at 23:23:50.203. It has good quality, its in alarm, has not been deleted from the scan and has a value of one. The point type is pre-fault and it called "Compressor_1".

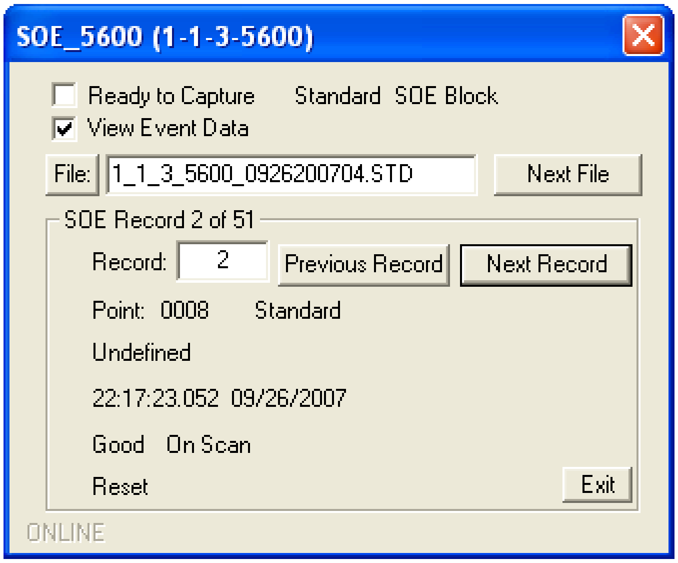
The fourth record is point #9 which was logged by the Bailey block on February 1, 2007 at 23:23:50.987. It has bad quality, its not in alarm, has not been deleted from the scan and has a value of zero. The point type is pre-fault and it called "Compressor_2".

In addition to the above file format, a CSV (comma separated variable) file for each SOE block is generated. The format of this file is compatible for opening by Microsoft Excel. The file name is the system address of the block (ring, node, module, block separated with an underscore character '_') followed by date of capture followed by a two digit (01 – 99) sequence code with an extension of '.CSV'. The number of points logged is implied by the total lines within the file. Also the first line is the titles for the columns within the file. The CSV capture files are stored in the C:\Program Files\OPC90 Server\SOE directory. This directory is also included in the OPC90 database shadowing feature. Consider the following example CSV file opened with Excel.



	A	B	C	D	E	F	G	H	I
1	POINT	DATE	TIME	QUALITY	ALARM	SCAN	VALUE	TYPE	NAME
2	3	09/26/2007	13:53:43.039	0	0	0	0	Standard	Burner Flame #4
3	5	09/26/2007	13:53:43.040	0	0	0	0	Standard	Undefined
4	9	09/26/2007	13:53:43.041	0	0	0	1	Standard	Undefined
5	11	09/26/2007	13:53:43.042	0	0	0	1	Standard	Undefined
6	15	09/26/2007	13:53:43.043	0	0	0	1	Standard	Undefined
7	19	09/26/2007	13:53:43.044	0	0	0	1	Standard	Undefined
8	29	09/26/2007	13:53:43.045	0	1	0	0	Standard	Undefined
9	33	09/26/2007	13:53:43.046	0	1	0	0	Standard	Undefined
10	116	09/26/2007	13:53:43.047	0	1	0	1	Standard	2EL/XST007

The SOE.EVENT tag is used control browsing of SOE log files. The client sets this tag to indicate its need to look at SOE log file data. When SOE.EVENT is set, the most current SOE log file for the given log type is automatically opened. Note that if the client has not set SOE.EVENT and a Bailey SOE block capture event occurs, the SOE.EVENT tag will automatically set. The SOE.FILE tag indicates the currently opened file, SOE.COUNT the number of records in that file, SOE.RECORD the current record number and SOE_POINT_* provides all of the point information contained by that record. The SOE.NEXTREC tag can be set to advance to the next record within the current file or SOE.RECORD written to a specific record number within the file. The SOE.NEXTFILE tag can be set to advance to the next oldest SOE log file or SOE.FILE can be written to look at a specific file. Note that writes to SOE.FILE do not require path information but can be included if the SOE log files have been moved to an alternative location. Note also that SOE.NEXTREC and SOE.NEXTFILE will automatically reset to indicate the requested action has been completed. All of these tags are utilized to implement the following OPC90 SOE block faceplate.



SOE_5600 (1-1-3-5600)

□ Ready to Capture   Standard SOE Block

☑ View Event Data

File: 1_1_3_5600_0926200704.STD

SOE Record 2 of 51

Record: 2

Point: 0008   Standard

Undefined

22:17:23.052 09/26/2007

Good   On Scan

Reset

ONLINE

7.29 SPEC Specification Block (SPEC)

The SPEC OPC90 block is used to retrieve block specification data for any configured Bailey function block. This block is similar to the OPC90 Server block BLK with the exception that the client does not have to send a command to read the specifications and cannot browse blocks using a NEXT tag. The SPEC block retrieves block specification information through background polling activity. The block address is configured in the RING, NODE, MODULE and BLOCK attributes of this block in the OPC90 Server configuration and thus cannot be changed by OPC Clients. Each time the Bailey block data is polled, the specification values returned are copied to the S01_VALUE through S63_VALUE tags. Specification text description data is returned in the corresponding S01 to S63 tags.

Restrictions: None, this OPC90 block can be utilized with all Bailey interface types.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/ Read/Write	Bailey ring address.
ADDR_NODE	VT_I2	Config/ Read/Write	Bailey node address.
ADDR_MODULE	VT_I2	Config/ Read/Write	Bailey module address.
ADDR_BLOCK	VT_I2	Config/ Read/Write	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
ACKNAK	VT_I2	Read	Result of the last block read. A non-zero code indicates an error has occurred.
FC	VT_I2	Read	Function code # returned for the block.
FCNAME	VT_BSTR	Read	Function code name returned for the block.
SX_COUNT	VT_I2	Read	Number of valid specifications for block.
SPEC_FORMAT	VT_I2	Read/Write	Determines how specification data is to be formatted (see note 1).
S01 to S63	VT_BSTR	Read	Text description data for specifications 1 through 63.
S01_VALUE to S63_VALUE	VT_R4	Read/Write	Value for specifications 1 through 63.

Since Bailey function blocks can have up to 63 specifications, tags exist for the maximum number of specifications. The actual number of valid specifications for any given block read can be determined by examining SX_COUNT or the descriptions assigned to them in tags S01 to S63. Null descriptors indicate the specification number is not valid for the block read.

Some Bailey specifications can be modified while the block is executing. These are called tunable specifications and are indicated as such by the specification description having the ‘T’ character in front of it. The tags S01_VALUE through S63_VALUE can be used to change the value of tunable specifications.

Notes:

1.) The format of how the specification data is returned can be selected utilizing the SPEC_FORMAT attribute. The following choices are available:

0 - Sx Name Value	Format includes spec number, its name and current value
1 - Name Value	Format includes spec name and its current value
2 - Sx Name	Format includes spec number, and its name
3 - Name	Format includes just the name of the spec

7.30 Station PID Control (STN)

The STN OPC90 block is used to retrieve and control the exception reported outputs from Bailey Control Station blocks (function codes 21, 22, 23 & 80).

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read	Current quality of Bailey values: 0=good, 1=bad.
STN_TYPE	VT_I2	Read	Station type: 1=Basic, 2=Ratio, 4=Cascade.
STN_LEVEL	VT_BOOL	Read/Write	Station level (see note 1): 0=Local, 1=Computer.
STN_OK	VT_BOOL	Read	Station computer ok indicator (see note 1): 0=Bad, 1=Ok.
STN_TIMER	VT_I4	Read	Station time in seconds since last computer write (see note 1).
MODE	VT_I2	Read/Write	The mode of the Bailey block (see note 1): 0=Manual 1=Auto 2=Cascade
MODE_LOCK	VT_BOOL	Read	Locked into current mode indicator.
EU	VT_I2	Read	Engineering Units Code.
EU_TEXT	VT_BSTR	Read	Engineering Units String
PID_BLOCK	VT_I2	Read/Write	The Bailey PID/SMITH Predictor block address associated with this control station (see note 2).
SP_TRACKING	VT_BOOL	Read	Set point tracking indicator.
SP	VT_R4	Read/Write	Current control station set point.
SP_HI_LIM	VT_R4	Read	SP high limit.
SP_LO_LIM	VT_R4	Read	SP low limit.
PV	VT_R4	Read	Current control station process value.
PV_BLOCK	VT_I2	Read	Process value block address.
RI	VT_R4	Read/Write	Current control station ratio index value.
OUT_TRACKING	VT_BOOL	Read	Control output tracking indicator.
OUT	VT_R4	Read/Write	Current control output value received from Bailey.
OUT_HI_LIM	VT_R4	Read/Write	OUT high limit (see note 3).

OUT_LO_LIM	VT_R4	Read/Write	OUT low limit (see note 3).
RED_CMD	VT_BSTR	Read/Write	Red tag command (see red tag users section).
RED_TAG	VT_BOOL	Read	Red tag indicator (0 – no, 1 – yes).
RED_USERS	VT_BSTR	Read	Red tag users (current user names or codes).
HI_ACT	VT_BOOL	Read	PV High alarm active indicator.
LO_ACT	VT_BOOL	Read	PV Low alarm active indicator.
PV_HI_LIM	VT_R4	Read	PV high limit.
PV_LO_LIM	VT_R4	Read	PV low limit.
HI_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the PV high alarm condition.
LO_LIM	VT_R4	Read/Write	The setting for the alarm limit used to detect the PV low alarm condition.
DV_LIM	VT_R4	Read/Write	PV Deviation limit.
DV_HI_ACT	VT_BOOL	Read	High deviation alarm active indicator.
DV_LO_ACT	VT_BOOL	Read	Low deviation alarm active indicator.
KFAST	VT_BOOL	Read/Write	Indicates PID/SMITH STN block is in fast update mode (see note 5).
KGET	VT_BOOL	Read/Write	Setting this tag requests an immediate read of the PID/SMITH tuning parameters (K tags). It is automatically reset when the read has been completed. This tag cannot be set until after the STN block PID/SMITH function code (.KFC) has been determined.
KFC	VT_R4	Read	PID/SMITH function code number.
KTYPE	VT_BSTR	Read	PID/SMITH type informational string.
KDIR	VT_R4	Read/Write	PID direction switch (see note 4): 0 = reverse acting, SP - PV 1 = direct acting, PV – SP or SMITH predictor external reference flag which can not be written: 0 = normal 1 = use external reference
KIONLY	VT_R4	Read/Write	PID set point modifier (see note 4): 0 = normal 1 = integral only on set point change
K	VT_R4	Read/Write	Overall PID block gain term or SMITH predictor process model gain (see note 4).
KP	VT_R4	Read/Write	PID block proportional gain value (see note 4).
KI	VT_R4	Read/Write	PID block integral action time constant or SMITH Predictor controller tuning time constant (see note 4).
KD	VT_R4	Read/Write	PID block derivative action time constant or SMITH Predictor process model deadtime (see note 4).
KDLAG	VT_R4	Read/Write	Advance PID (only) block derivative lag action time constant or SMITH Predictor process model lag time constant (see note 4).
AO_BYPASS	VT_BOOL	Read	Analog output bypass indicator.
DS_BAD	VT_BOOL	Read	Analog output associated with Digital station (hard DCS station) bad indicator (see note 6).

Notes:

1.) OPC90 can control the STN block in both local and computer level. The STN_LEVEL tag indicates the current STN block level (0 = local, 1 = computer). The STN block level can be commanded to local or computer by writing the respective values 0 or 1 to STN_LEVEL. When a client commands the STN block to the computer level it must satisfy the Bailey STN block computer ok timer. This is accomplished by periodically issuing supervisory control writes of the mode, set point or ratio index values. The client can also periodically write a value of 1 to STN_OK or STN_LEVEL to satisfy the Bailey STN block computer ok timer (see Device block *AUTOMATIC SEND STN CPU_OK* setting to delegate management of computer ok to OPC90). The STN_OK tag reports the status of the Bailey STN block computer ok timer. The client can monitor the STN_TIMER tag to determine the elapsed time that has transpired since the last computer level supervisory control (mode, set point, ratio index), STN_OK or STN_LEVEL write occurred. This timer is active when STN_LEVEL indicates computer level and STN_OK indicates ok. When writing mode, OPC90 first checks the current level of the STN block and sends out the appropriate new mode command based on the current level. So for example if you command the STN block mode to auto by writing a value of 1 and the STN level is currently computer manual, OPC90 will send out the appropriate mode command for computer auto. The important thing to remember is the values used to indicate and control Bailey STN block mode are always 0 = manual, 1 = auto, 2 = cascade regardless of STN block level (local or computer).

2.) The default value of zero instructs the driver to automatically determine the PID/SMITH block number associated with the Bailey control station block. It follows the block input stream starting with the STN S3 input looking for the existence of a PID of type FC 18, 19, 156 or SMITH Predictor (FC 160). If one is found, it's block number is written to this tag. Otherwise, the value is set to -1 to indicate PID/SMITH block not found. This will be the case if a PID/SMITH is not configured or two or more PID/SMITHs are found in the STN input stream. In this circumstance the user must write the associated PID/SMITH block number to this tag to make the other STN.K* tuning items functional. It is important to note that if the other STN.K* tags are not functioning, check the value of this tag, making sure it has a valid PID/SMITH block number. Until an actual PID/SMITH block is determined, the OUT_HI_LIM, OUT_LO_LIM, K, KFC, KTYPE, KDIR, KIONLY, KP, KI, KD and KDLAG remain unknown.

3.) OUT_HI_LIM and OUT_LO_LIM are the high and low limit specifications read from the Bailey PID/SMITH block associated with the Bailey Control Station block. Writing these values from OPC90 causes the driver to automatically tune them in the appropriate Bailey PID/SMITH block specification.

4.) K, KDIR, KIONLY, KP, KI, KD and KDLAG are specifications read from the Bailey PID/SMITH block associated with the Bailey Control Station block. Writing these values from OPC90 causes the driver to automatically tune them in the appropriate Bailey PID/SMITH block specification.

5.) When any of the K, KDIR, KIONLY, KP, KI, KD and KDLAG tags are written (even writing the same value), OPC90 Server automatically puts the STN block into the “fast update” state. This state causes OPC90 Server to acquire the STN.PV and STN.CO values with a polling command instead of exception reporting. This operation is very useful for loop tuning software. The duration for the fast update state and polling interval are device settings (see DEVICE block). The KFAST attribute indicates the fast update state is in effect. The fast update interval can be refreshed by writing a one to the KFAST attribute or writing a new value to any of the other K tags (see note 4). The fast update interval is canceled automatically when the fast update interval for the STN block has transpired or a value of zero is written to the KFAST attribute. Some applications may want to have direct control of the KFAST feature and not have writes to the other K* values automatically turn it on. This can be accomplished by turning off the DEVICE block “Set .KFAST on .K* writes” property.

6.) When the analog output associated with a digital control station is bad, the STN block is locked into manual mode. Attempted mode changes when the DS_BAD value indicates bad will be rejected.

7.31 TXT Text Selector (TXT)

The TXT OPC90 block is used to retrieve the exception reported output from Bailey Text Selector blocks (function code 151).

Restrictions: This OPC90 block can be utilized with all Bailey interface types except serial port module (SPM & CPM02).

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
MSG_OUT	VT_I4	Read	Message number to be displayed.
MSG_OUT_TEXT	VT_BSTR	Read	Message number to be displayed as a string.
COLOR	VT_I2	Read	Color selection for the message.
BLINK	VT_BOOL	Read	Blink the message flag.

7.32 Text String (TEXTSTR)

The TEXTSTR OPC90 block is used to retrieve the exception reported output from Bailey Text String blocks (function code 194).

Restrictions: This OPC block is only valid for Bailey interface types INICI03, INICI12 and INICI13.

TAGNAME	TYPE	ACCESS	DESCRIPTION
ADDR_RING	VT_I2	Config/Read	Bailey ring address.
ADDR_NODE	VT_I2	Config/Read	Bailey node address.
ADDR_MODULE	VT_I2	Config/Read	Bailey module address.
ADDR_BLOCK	VT_I2	Config/Read	Bailey block address.
MESSAGE	VT_BSTR	Read	Provides the block operational message.
TAG	VT_BSTR	Read	Provides the block name.
TAGLONG	VT_BSTR	Read	Provides the block long OPC path name.
TAGDESC	VT_BSTR	Read	Provides the block descriptor.
QUALITY	VT_BOOL	Read	Current quality of Bailey values (0-good, 1-bad).
QUAL_OVR	VT_BOOL	Read	Quality override (0-Off, 1-On).
EU	VT_I2	Read	Engineering Units Code.
EU_TEXT	VT_BSTR	Read	Engineering Units String.
MODE	VT_I2	Read/Write	The mode of the Bailey block. 0 - Manual 1 - Auto
MODE_LOCK	VT_BOOL	Read	Mode lock (0-Off, 1-On).
ALARM	VT_BOOL	Read	Alarm active indicator.
ALARM_REQ	VT_BOOL	Read/Write	Alarm request (0-No, 1-Yes) (see note 1).
TEXTSTR	VT_BSTR	Read/Write	Text string value (see note 2).
TEXTSTR_LOCK	VT_BOOL	Read	Text string lock (0-Off, 1-On).
TEXTSTR_MAX	VT_I2	Read	Maximum text string size allowed.
TEXTSTR_SEQ	VT_I2	Read	Comm system text string sequence number.

Notes:

1.) When ALARM_REQ is set (1) and a write occurs to TEXTSTR, the write will specify the string is in alarm.

2.) The text string value can be written when the block is in manual mode, the text string lock is not on and the TEXTSTR application and / or block configuration supports writes.

8 CSV File Formats

This section is provided to help the user quickly setup an OPC90 Server configuration. A CSV file is an ASCII Text based file containing fields delimited by a comma. Miscrosoft Excel can be used to create this file and simply export it in the CSV file format. Each line (row in Excel) in the file declares exactly one OPC90 block. OPC90 groups and tags are not defined within the file. Groups and tags will be created automatically based on the block name and type. File formats for each line in the CSV file are given below. If you are still unsure about the exact format after reviewing the following tables, consult the SamplePoints.CSV included with the OPC90 installation. You can also configure an example of a block using OPC90 Server itself and than export that database to a CSV file.

In addition to configuring OPC90 blocks, the CSV file supports the definition of the engineering units map and text message map. These maps are normally defined using the OPC90 Edit->Engineering Units and Edit->Text Messages dialogs. Definitions within the CSV file allow bulk definition of these two maps.

The format for defining the maps and block definitions are presented by the following tables.

Map Definition	Fields
EUMAP	EU Text, EUMAP, EU Code (valid range is 0 – 255)
REDUSER	Name, User number (1-128), User Code (1 – 65535)
TEXTMAP	Text Message, TEXTMAP, Text Message Number (valid range is 0 – 10000)
SOEPOINT	Point Name, SOEPOINT, Point Number (0-511), Point Set (1-4)

Block	Fields
AIL	Block Name, Block Type, Location, Description
AOL	Block Name, Block Type, Location (only block #), Description, Max Time, Initial Value, EU code, Zero, Span, Significant Change, High Alarm Limit, Low Alarm Limit
BLK	Block Name, Block Type, Location, Description, Password
DAANG	Block Name, Block Type, Location, Description
DADIG	Block Name, Block Type, Location, Description
DD	Block Name, Block Type, Location, Description, F1LSD0, F1LSD1, F2LSD0, F2LSD1, OUTLSD0, OUTLSD1
DEVICE	Device Name, Block Type, Port, Description, Max Outputs, Watchdog Timer, Import Exception Report Update Rate, Background Poll Rate, STN Fast Update Period, STN Fast Update period, Exception Report Screen Flag, Establish Points Online Flag, System Type Flag (0 = Infi90, 1 = Network 90), Get Set Time Flag, Get Time Flag, Time Warp Flag, Use DCS Time Stamp Flag, Lock Flag, Enable Simulation Flag, Simulate Device Input Blocks Flag, Simulation AOL and DOL Block Inputs, Simulate Factor, Tag Startup Status (1 = Good, 2 = Uncertain, 4 = Bad), Continuous OPC Client Update Flag, Exception Report Write Confirmation flag, Group Output Writes flag, Output Exception Report Update Rate, Log Save Days, Enhanced Analog Precision Flag, MSDD Pulse Out Handling Flag, Override DCS Time Stamp Flag, SOE Save Days, Automatic STN CPU_OK Flag, Extended STN.MODE range, Tag Startup Complete on XRP, Set STN.KFAST on STN.K* Writes, Set Output Block Types QUALITY Bad When No Inputs
DIL	Block Name, Block Type, Location, Description, OUTLSD0, OUTLSD1

DOL	Block Name, Block Type, Location (only block #), Description, Max Time, Initial Value, Alarm State
HAI	Block Name, Block Type, Location, Description
HAO	Block Name, Block Type, Location, Description
HDI	Block Name, Block Type, Location, Description, OUTLSD0, OUTLSD1
HDO	Block Name, Block Type, Location, Description, OUTLSD0, OUTLSD1
MODSTAT	Block Name, Block Type, Location (ring, node, module), Description
MSDD	Block Name, Block Type, Location, Description, F1LSD0, F1LSD1, F2LSD0, F2LSD1, F3LSD0, F3LSD1, F4LSD0, F4LSD1, GSLSD0, GSLSD1, GSLSD2, GSLS3
MUXCIU	Block Name, Block Type, Port, Description, Read Only
ODD	Block Name, Block Type, Location (only block #), Description, Max Time, 0, Faceplate Type
OMSDD	Block Name, Block Type, Location (only block #), Description, Max Time, 0, Faceplate Type
ORCM	Block Name, Block Type, Location (only block #), Description, Max Time, 0, Faceplate Type
ORMC	Block Name, Block Type, Location (only block #), Description, Max Time, 0, Faceplate Type
ORMSC	Block Name, Block Type, Location (only block #), Description, Max Time, EU code, Zero, Span, Significant Change
OSTN	Block Name, Block Type, Location (only block #), Description, Max Time, EU code, Zero, Span, Significant Change, High Alarm Limit, Low Alarm Limit, Deviation Alarm Limit, Station Type
POLL	Block Name, Block Type, Location, Description, Poll Interval
RCM	Block Name, Block Type, Location, Description, F1LSD0, F1LSD1, OUTLSD0, OUTLSD1
RMC	Block Name, Block Type, Location, Description, F1LSD0, F1LSD1, F2LSD0, F2LSD1, PERM1LSD0, PERM1LSD1, PERM2LSD0, PERM2LSD1, OUTLSD0, OUTLSD1
RMSC	Block Name, Block Type, Location, Description
SPEC	Block Name, Block Type, Location, Description
STN	Block Name, Block Type, Location, Description
TEXT	Block Name, Block Type, Location, Description
TEXTSTR	Block Name, Block Type, Location, Description

The following table is a guide to understanding the various block fields used when defining OPC90 blocks

FIELD NAME	FIELD DESCRIPTION	Examples
Block Name	Contains the case-insensitive full block name (not the tagname). The full block name includes the device name followed by all groups followed lastly by the block name. (see notes)	CIU4.Group1.STN1 Device1.DIL23 CIU4 CIU4.Unit1.Boiler.Turbine.Mtr1
Block Type	Specifies the case-insensitive OPC90 Server Block Type as one of the following strings: AIL, AOL, BLK, DEVICE, DAANG, DADIG, DIL, DOL, HAI, HAO, HDI, HDO, MODSTAT, MSDD, ODD, OMSDD, ORCM, ORMC, ORMSC, OSTN, POLL, RCM, RMC, RMSC, SPEC, STN, TXT, TEXTSTR	AIL, Ail, ail, stn, STN, AOL, RMSC
Location	Specifies the Bailey address as: Bailey ring address. Bailey node address. Bailey ring address. Bailey block address. Address fields must be separated by a dot not a comma. For AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC and OSTN blocks simply	1.1.2.1000 “1.1.2.1000” 1.1.4.200 200 (for AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC, OSTN) “200” (for AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC, OSTN)

	require the bailey block #. For MODSTAT blocks simply require the ring.node.module The address can be encased in quotation marks if desired.	1.1.2.200 (for AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC, OSTN where the 1.1.2 is disregarded) COM1: (for DEVICE) 1.1.5 (for MODSTAT) 1.1.5.12 (for MODSTAT where block 12 is disregarded)
Port Description	For DEVICE blocks this field specifies the Com Port such as COM1:, COM2:, COM3: or COM4:.	
Description	User-Defined description of the block. This can be encased in quotation marks if desired they will be parsed out. However, no commas are allowed within the description field.	“Unit 1 Boiler Exhaust Flow” “PID1024” Test Block Description
MaxTime or Interval	Only used for AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC, OSTN and POLL blocks. Specifies the MaxTime (in seconds) for AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC and OSTN blocks.	10
Poll Interval	Used for POLL blocks specifying the polling interval in milliseconds.	1000
Read only	Used for MUXCIU block read only option	0 = no or 1 = yes
InitialValue	Only for AOL and DOL blocks. Specifies the initial value for these blocks. Must be defined as 0 for ODD, OMSDD, ORCM, ORMC block. Must not be defined for ORMSC and OSTN blocks.	12.456 0 or 1 (for DOL)
EU or AlarmState or FaceplateType	Specifies the EU Units integer value for AOL, ORMSC and OSTN blocks. For DOL blocks this field specifies the AlarmState: 0-alarm when 0 1-alarm when 1 2-alarming disabled. For ODD, OMSDD, ORCM and ORMC blocks this field specifies the faceplate type code.	10 0,1 or 2 (for DOL)
Zero	For AOL, ORMSC and OSTN only. Specifies the value of the zero in engineering units.	-1000.0
Span	For AOL, ORMSC and OSTN only. Specifies the value of the span in engineering units.	2000.0
Significant Change	For AOL, ORMSC and OSTN only. Specifies the value of the significant change in engineering units.	1.5
HI LIMIT	For AOL and OSTN only. Specifies the value for the alarm limit used to derive the high alarm condition.	900.0
LO LIMIT	For AOL and OSTN only. Specifies the value for the alarm limit used to derive the low alarm condition.	100.0
DV ALARM	For OSTN only. Specifies the Station deviation alarm (difference between SP and	10.0

	PV).	
Station Type	For OSTN only. Specifies the Station type code as follows: Basic with SP Ratio Cascade Basic without SP Basic with Bias	0

Notes:

1) A line for each DEVICE block should be declared in the CSV file otherwise they will automatically be created given the first field in the Block Name. For example Block name of CIU4.Unit1.Block1 will automatically create a DEVICE block with the name of CIU4 at port COM1: if a line for that device block was not already declared within the file.
2) If the DEVICE block name is missing within the block name field #1 then a DEVICE block will be automatically created with the default name of “Device1”. Thus you can simply enter a name for each block and they will be added under the “Device1” device. You can then change the name of the device block in the configurator. For example, if PID1024 is specified for field 1 then the driver will place it under the “Device1” DEVICE block.
3) Groups should not be included within the CSV file. For example, if there are 200 AIL blocks that need to be imported into the configuration and you wanted to group them you may put them in a single group called AREA1, for example. Block Names such as “CIU4.AREA1.AIL1” to “CIU4.AREA1.AIL200” would be found in the CSV file. However you do not need to add a line for the AREA1 group itself such as “CIU4.AREA1”. The group will be automatically created.
4) If the logic state descriptors associated with digital blocks are not defined they will be defaulted to values of “Off” and “On”.

Example1: File <OPCUnit1.csv>:

Importing the following CSV file will cause the configurator to create a default device block called “Device1”. All the the blocks defined within this file will then be placed under that DEVICE block. Note fields 5 to12 are omitted.

```
1BLKULD,DIL,1.1.4.6003,BLOCK UNIT LOAD DEC,Reset,Set
1BLCKTURBD,DIL,1.1.4.6004,BLOCK TURBINE DEC,Stopped,Running
AFDRSPD,STN,1.1.4.6009,A FEEDER SPEED STATION
1BIDINDEV,DIL,1.1.4.6029,B ID FAN INLT DMPR DEV,Off,On
CFDRSPD,STN,1.1.4.6061,C FEEDER SPEED STATION
1CFDRBCKE,RCM,1.1.4.6068,C FEEDER RUNBACK,BAD,GOOD,Stopped,Run
UNIT_GROSS_MW,AIL,1.1.4.663,UNIT GROSS MW
UNIT_GROSS_MVAR,AIL,1.1.4.664,UNIT GROSS MVAR
GEN_VOLTS,AIL,1.1.4.665,GENERATOR VOLTS
```

Example2: File <OPCUnit2.csv>:

Importing the following CSV file will cause the OPC90 Server configurator to create a DEVICE block called CIU4 configured for port COM2:. All subsequent lines in this file will declare blocks to be added to that device.

```
CIU4,DEVICE,COM1:,Test INICI03,2000,0,1000,60000,10,1000,0,0,0,0,0,0,0,0,
0,1,0,10,4,0,0,1,100,7,1,1,1,3,1
CIU4.AIL1,AIL,1.1.5.31,,0,0,0,0,0,0,0,0
CIU4.AOL1,AOL,40,Test AOL Block,10,13.4,2,-1000,2000,1.5,900,10
CIU4.ODD1.ODD,41,Test ODD Block,60,0,1
CIU4.BLK1,BLK,1.1.3.86,,0,0,0,0,0,0,0,0
CIU4.DAANG1,DAANG,1.1.3.48,,0,0,0,0,0,0,0,0
CIU4.DIL1,DIL,1.1.3.155,,0,0,0,0,0,0,0,0
CIU4.MODSTAT1,MODSTAT,1.1.5,,0,0,0,0,0,0,0,0
CIU4.POLL1,POLL,1.2.3.4,Poll Block #1,2134
CIU4.SPEC2,SPEC,1.1.3.86,Spec Block #2
CIU4.STN1,STN,1.1.3.86,Station #
```

9 Setting up OPC Client Access of OPC90

The RoviSys website (www.rovisys.com) contains additional documents that provide specific instructions on how to setup OPC90 to work with a variety of commercially available OPC clients. If your OPC client is not listed, please consider writing a short "Using OPC90 With …" document and submit to spafford@rovisys.com.

Windows DCOM must be properly configured to allow OPC clients running on the local and / or remote PCs to gain access of OPC90. The Windows program called DCOMCNFG.EXE is used to configure these DCOM settings. This program can be started using the OPC90 Utilities menu item.

Note that depending on the operating environment (Windows Workstation or Server, local user account or domain user account), the exact DCOM settings may vary. The following example sets up the OPC90 settings to "default" which means use those setup for "My Computer". It also assigns the most open settings for "My Computer". If this example does not work for your system or tighter security is required, try different combinations until one is found that works correctly and satisfies the security requirements. For example instead of setting OPC90 to use the "My Computer" default settings, assign it custom settings with a smaller set of authorized users. Running OPC90 as a service will sometimes require additional adjustments depending on the operating system in use, its workgroup / domain residency and whether or not the service is running as a system service or preferably (and required when using the OPC90 "Database Shadowing feature") in a privileged user account. Note that when running as a service, make sure it is stopped and started after any changes to the DCOM settings are made.

The local OPC90 PC and remote PCs that will be running OPC client software must both be setup. The settings presented in this section provide the most open remote OPC client access to OPC90 Server. Once remote access has been setup and validated, the settings can be adjusted for any site specific security needs.

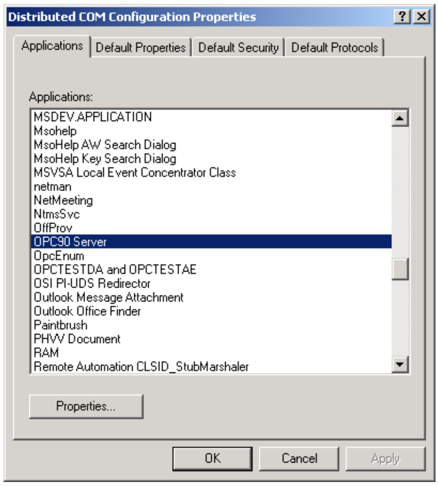
9.1 Configuring DCOM On The Local OPC90 PC

The first step is to select or setup a user account that at a minimum is a member of the "Power Users" group but preferably the "Administrator" group. This account will be used by DCOM to run OPC90 as a service or when an access request is received from a remote OPC client. If such an account does not exist, create one called "OPC90", assign it to the "Administrator" group and assigned a valid Windows password to the account such as "opc90server".

When both local and remote PCs have been setup to exist within a domain, both should use the same domain user account to run OPC90 and the clients that will attach to it. If the PCs are setup in a workgroup, the user account and password selected to run OPC90 on the local PC must be duplicated on the remote PC and the OPC clients on the remote run under that same account.

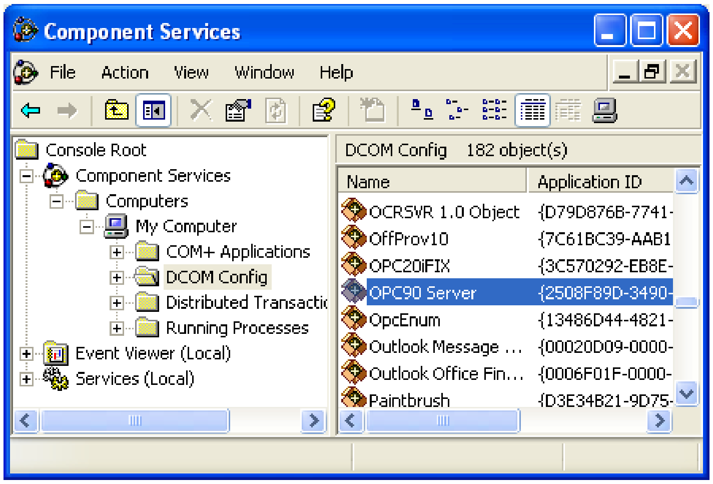
If Windows XP / 2003 Server is being utilized with Service Pack 2 or later and the Windows firewall is enabled, OPC90 and the OPC clients must be added to the list of firewall exceptions for each PC running OPC90 or the OPC client. Also a port named DCOM with port number 135 associated with TCP must be added to the local and remote PCs. This is setup by running ControlPanel | Windows Firewall. For additional information consult the document entitled "OPC With DCOM With XP SP2.PDF". This document has been installed in the C:\Program Files\OPC90 Server directory.

To run DCOMCNFG select "Start | Run" and type in DCOMCNFG (or start it from the OPC90 Utilities menu selection). Based on the Windows operating system being used, one of the two following program windows will be displayed.



Applications:

MSDEV.APPLICATION
Msohelp
MsoHelp AW Search Dialog
MsoHelp Key Search Dialog
MSVSA Local Event Concentrator Class
netman
NetMeeting
NtmsSvc
OffProv
OPC90 Server
OpcEnum
OPCTESTDA and OPCTESTAE
OSI PI-UDS Redirector
Outlook Message Attachment
Outlook Office Finder
Paintbrush
PHVV Document
RAM
Remote Automation CLSID_StubMarshaler

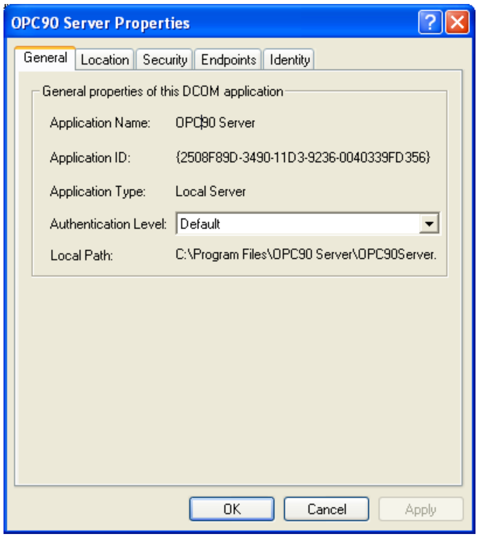


DCOM Config 182 object(s)

Name	Application ID
OCRSVR 1.0 Object	{D79D876B-7741-
OffProv10	{7C61BC39-AAB1
OPC20iFIX	{3C570292-EB8E-
OPC90 Server	{2508F89D-3490-
OpcEnum	{13486D44-4821-
Outlook Message ...	{00020D09-0000-
Outlook Office Fin...	{0006F01F-0000-
Paintbrush	{D3E34B21-9D75-

Select "OPC90 Server" which can be found under the Application tab list box or under "Components | Computers | My Computer | DCOM Config". Click on the properties button (or right click on "OPC90 Server" and select properties) and one of the two following dialogs will appear.

OPC90 not as a Service



General properties of this DCOM application

Application Name: OPC90 Server

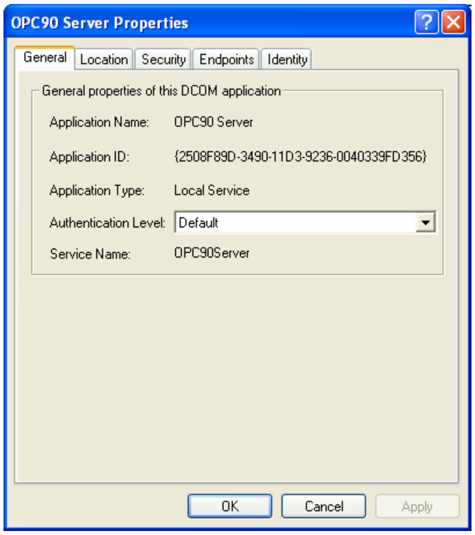
Application ID: {2508F89D-3490-11D3-9236-0040339FD356}

Application Type: Local Server

Authentication Level: Default

Local Path: C:\Program Files\OPC90 Server\OPC90Server.

OPC90 as a Service



General properties of this DCOM application

Application Name: OPC90 Server

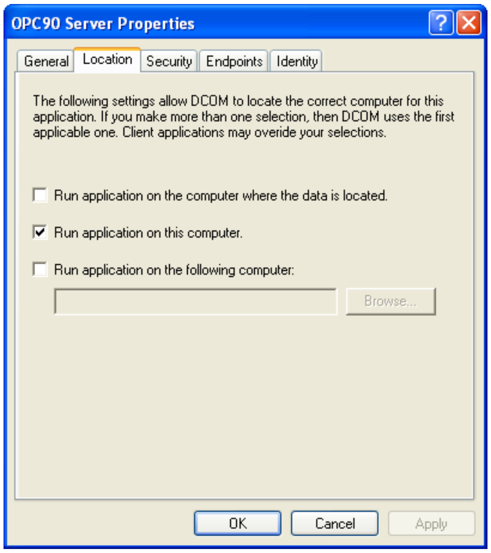
Application ID: {2508F89D-3490-11D3-9236-0040339FD356}

Application Type: Local Service

Authentication Level: Default

Service Name: OPC90Server

Under the General tab set the Authentication Level to (Default). Click on the location tab and the following dialog will appear:



The following settings allow DCOM to locate the correct computer for this application. If you make more than one selection, then DCOM uses the first applicable one. Client applications may overide your selections.

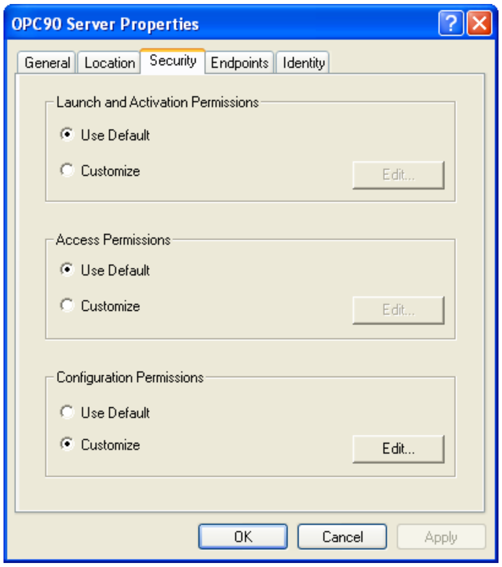
□ Run application on the computer where the data is located.

☑ Run application on this computer.

□ Run application on the following computer:

Enable the “*Run application on this computer*” checkbox.

Click on the Security tab and the following dialog will appear:



OPC90 Server Properties

General | Location | Security | Endpoints | Identity

Launch and Activation Permissions

● Use Default

○ Customize Edit...

Access Permissions

● Use Default

○ Customize Edit...

Configuration Permissions

○ Use Default

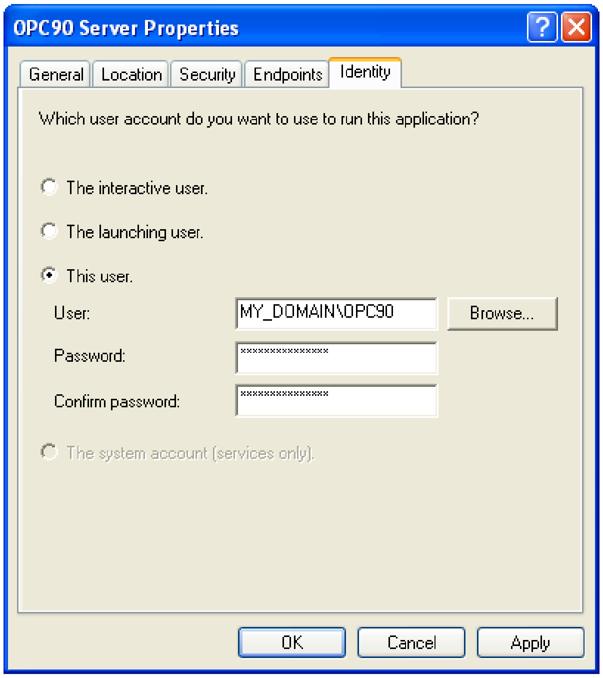
● Customize Edit...

OK Cancel Apply

Make the following selections:

- Use default access permissions,
- Use default launch permissions,
- Use customized configuration permissions

Click on the Identity tab and the following dialog will appear:



OPC90 Server Properties

General | Location | Security | Endpoints | Identity

Which user account do you want to use to run this application?

○ The interactive user.

○ The launching user.

● This user.

User: MY_DOMAIN\OPC90 Browse...

Password: ****************

Confirm password: ****************

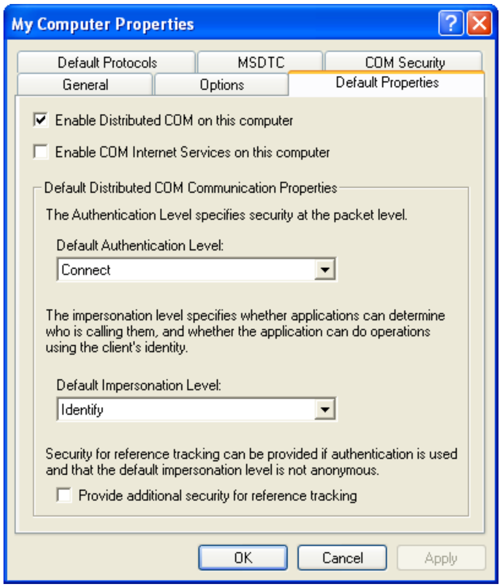
○ The system account (services only).

OK Cancel Apply

Select *this user* and type in the account information that will be used to run the OPC90 application. The account information must include the domain controller computer name (or local PC name for workgroup based systems), backslash character and user account that will be used to run OPC90. This example shows

“MY_DOMAIN\OPC90”. Use the actual domain or workgroup computer name and user account name for the specific system OPC90 has been installed.

Next select the DCOM properties of “My Computer” and set the following default properties:



☑ Enable Distributed COM on this computer

☐ Enable COM Internet Services on this computer

Default Distributed COM Communication Properties

The Authentication Level specifies security at the packet level.

Default Authentication Level: Connect

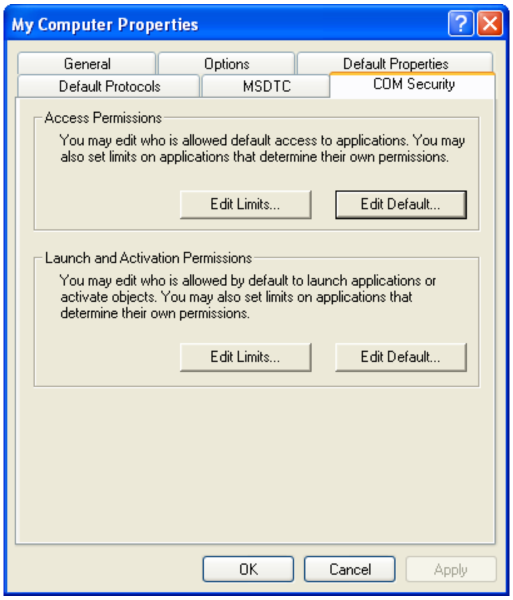
The impersonation level specifies whether applications can determine who is calling them, and whether the application can do operations using the client's identity.

Default Impersonation Level: Identify

Security for reference tracking can be provided if authentication is used and that the default impersonation level is not anonymous.

☐ Provide additional security for reference tracking

Select the COM Security tab shown as follows:



Access Permissions

You may edit who is allowed default access to applications. You may also set limits on applications that determine their own permissions.

Launch and Activation Permissions

You may edit who is allowed by default to launch applications or activate objects. You may also set limits on applications that determine their own permissions.

Click on “Edit Default” for both the Access Permissions and Launch and Activation Permissions and ***add the following list of users***. Make sure “allow access” for both local and remote is enabled for all of these users. For Windows XP SP2 and Windows 2003, also check Edit Limits options for both the Access Permissions and Launch and Activation Permissions and make sure that these accounts are also added.

ANONYMOUS LOGON
Everyone
INTERACTIVE
NETWORK
NETWORK SERVICES *
Self *
SYSTEM
Distributed com users*

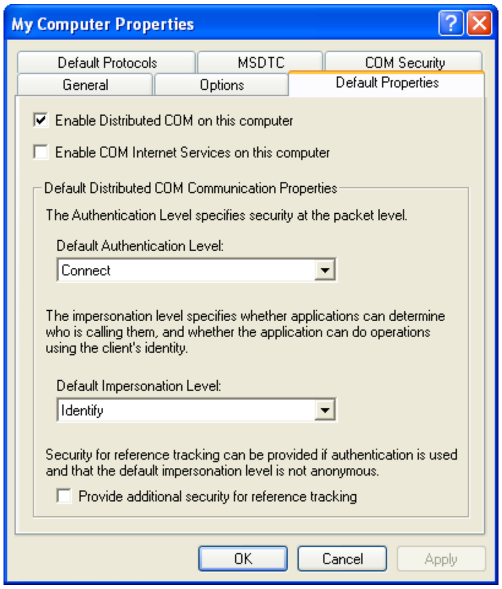
* These users are not supported on earlier Windows operating systems.

Setup of DCOM on the local OPC90 PC is complete. If the OPC client cannot access OPC90 after completing this setup, try rebooting the PC. Depending on the types of changes made to “My Computer” DCOM settings a reboot of the PC may be required.

9.2 Configuring DCOM on the Remote OPC Client PC

Some OPC clients utilize a mechanism called “Data Callbacks” to receive data values from an OPC server. For these types of clients, the remote PC must have its access permissions enabled to receive the callbacks. If an OPC client can attach to the server but not receive data values, this is a sign it relies on callbacks and therefore the PC access permissions must be adjusted. Do the following procedure to make these adjustments.

Run DCOMCNFG and select the DCOM properties of “My Computer” and set the following default properties:



☑ Enable Distributed COM on this computer

□ Enable COM Internet Services on this computer

Default Distributed COM Communication Properties

The Authentication Level specifies security at the packet level.

Default Authentication Level: Connect

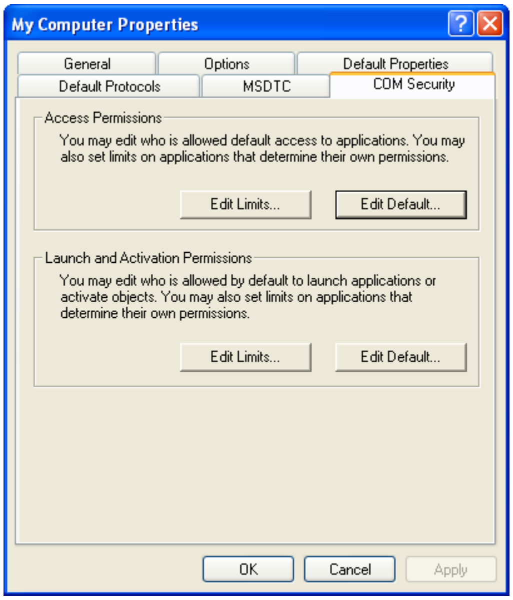
The impersonation level specifies whether applications can determine who is calling them, and whether the application can do operations using the client's identity.

Default Impersonation Level: Identify

Security for reference tracking can be provided if authentication is used and that the default impersonation level is not anonymous.

□ Provide additional security for reference tracking

Select the COM Security tab shown as follows:



Access Permissions

You may edit who is allowed default access to applications. You may also set limits on applications that determine their own permissions.

Launch and Activation Permissions

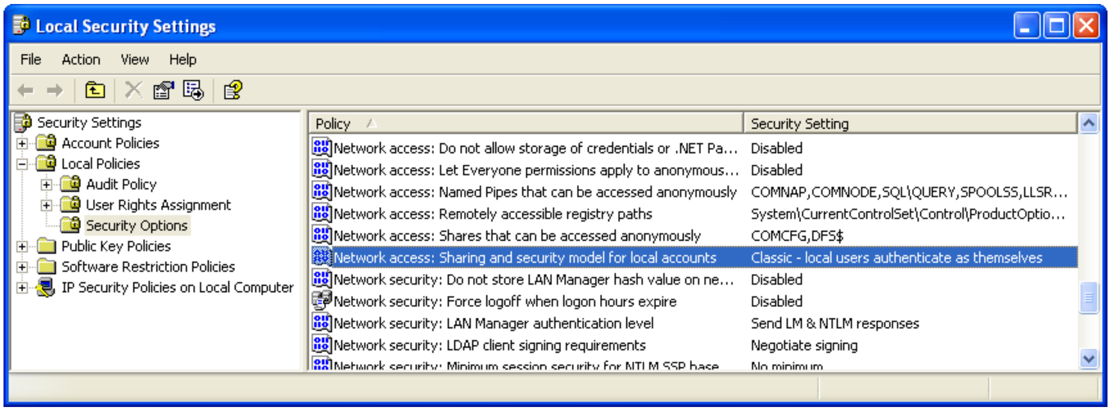
You may edit who is allowed by default to launch applications or activate objects. You may also set limits on applications that determine their own permissions.

Click on “Edit Default” for the Access Permissions and add the following list of users. Make sure “allow access” for both local and remote is enabled for all of these users.

ANONYMOUS LOGON
Everyone
INTERACTIVE
NETWORK
NETWORK SERVICES *
Self *
SYSTEM
Distributed com users*

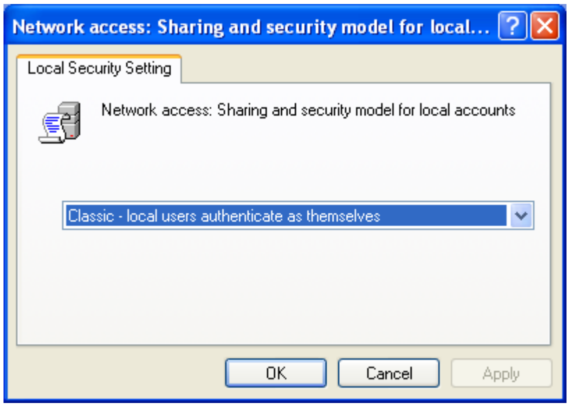
* These users are not supported on earlier Windows operating systems.

Changing the local security policy option might be required when the OPC client PC and OPC90 PC are running different Windows operating systems (i.e. XP and 2000) or using workgroup based PCs. Run Control Panel | Administrative Tools | Local Security Policy and select “Security Options” as displayed by the following.



Policy	Security Setting
Network access: Do not allow storage of credentials or .NET Pa…	Disabled
Network access: Let Everyone permissions apply to anonymous…	Disabled
Network access: Named Pipes that can be accessed anonymously	COMNAP,COMNODE,SQL\QUERY,SPOOLSS,LLSR…
Network access: Remotely accessible registry paths	System\CurrentControlSet\Control\ProductOptio…
Network access: Shares that can be accessed anonymously	COMCFG,DFS$
Network access: Sharing and security model for local accounts	Classic - local users authenticate as themselves
Network security: Do not store LAN Manager hash value on ne…	Disabled
Network security: Force logoff when logon hours expire	Disabled
Network security: LAN Manager authentication level	Send LM & NTLM responses
Network security: LDAP client signing requirements	Negotiate signing
Network security: Minimum session security for NTLM SSP base	No minimum

Double click on “Network access: Sharing and security model for local accounts” and set it to “Classic” as shown by the following dialog.



Network access: Sharing and security model for local accounts

Classic - local users authenticate as themselves

Setup of DCOM on the remote PC is complete. If the OPC client cannot access OPC90 after completing this setup, try rebooting the OPC client PC. Depending on the types of changes made to “My Computer” DCOM settings a reboot of the PC may be required.

9.3 Validating OPC Client Access of OPC90

When one or more OPC clients are started and they have requested a connection with OPC90, a single instance of the program can be observed using the Processes tab of Windows Task Manager shown by the following dialog.

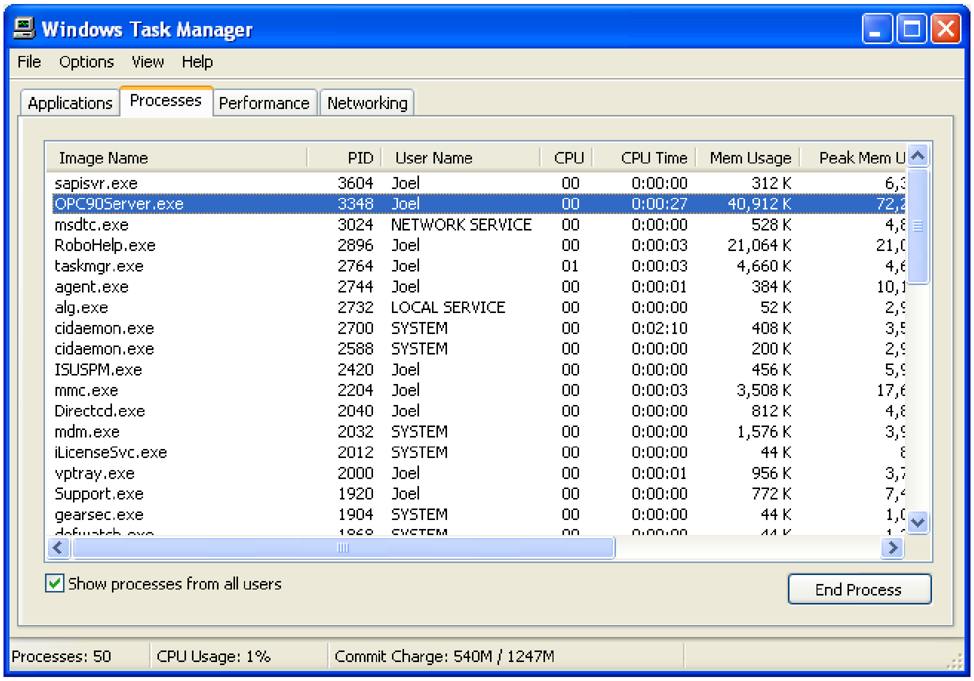


Image Name	PID	User Name	CPU	CPU Time	Mem Usage	Peak Mem U
sapisvr.exe	3604	Joel	00	0:00:00	312 K	6,3
OPC90Server.exe	3348	Joel	00	0:00:27	40,912 K	72,2
msdtc.exe	3024	NETWORK SERVICE	00	0:00:00	528 K	4,8
RoboHelp.exe	2896	Joel	00	0:00:03	21,064 K	21,0
taskmgr.exe	2764	Joel	01	0:00:03	4,660 K	4,6
agent.exe	2744	Joel	00	0:00:01	384 K	10,1
alg.exe	2732	LOCAL SERVICE	00	0:00:00	52 K	2,9
cidaemon.exe	2700	SYSTEM	00	0:02:10	408 K	3,5
cidaemon.exe	2588	SYSTEM	00	0:00:00	200 K	2,9
ISUSPM.exe	2420	Joel	00	0:00:00	456 K	5,9
mmc.exe	2204	Joel	00	0:00:03	3,508 K	17,6
Directcd.exe	2040	Joel	00	0:00:00	812 K	4,8
mdm.exe	2032	SYSTEM	00	0:00:00	1,576 K	3,9
iLicenseSvc.exe	2012	SYSTEM	00	0:00:00	44 K	8
vptray.exe	2000	Joel	00	0:00:01	956 K	3,7
Support.exe	1920	Joel	00	0:00:00	772 K	7,4
gearsec.exe	1904	SYSTEM	00	0:00:00	44 K	1,0
defwatch.exe	1968	SYSTEM	00	0:00:00	44 K	1,

☑ Show processes from all users

Processes: 50 CPU Usage: 1% Commit Charge: 540M / 1247M

If OPC90 has been configured to run as a service, a single instance of the program should be observed prior to running any OPC client.

If multiple instances of OPC90 are found running after two or more OPC clients have been started (and OPC90 has not been manually run), this is an indication of a DCOM setup error. This condition must be corrected before OPC90 can be properly utilized to serve its data to more then one OPC client. Failure to do so will result in only the first OPC client to run receiving data from OPC90.

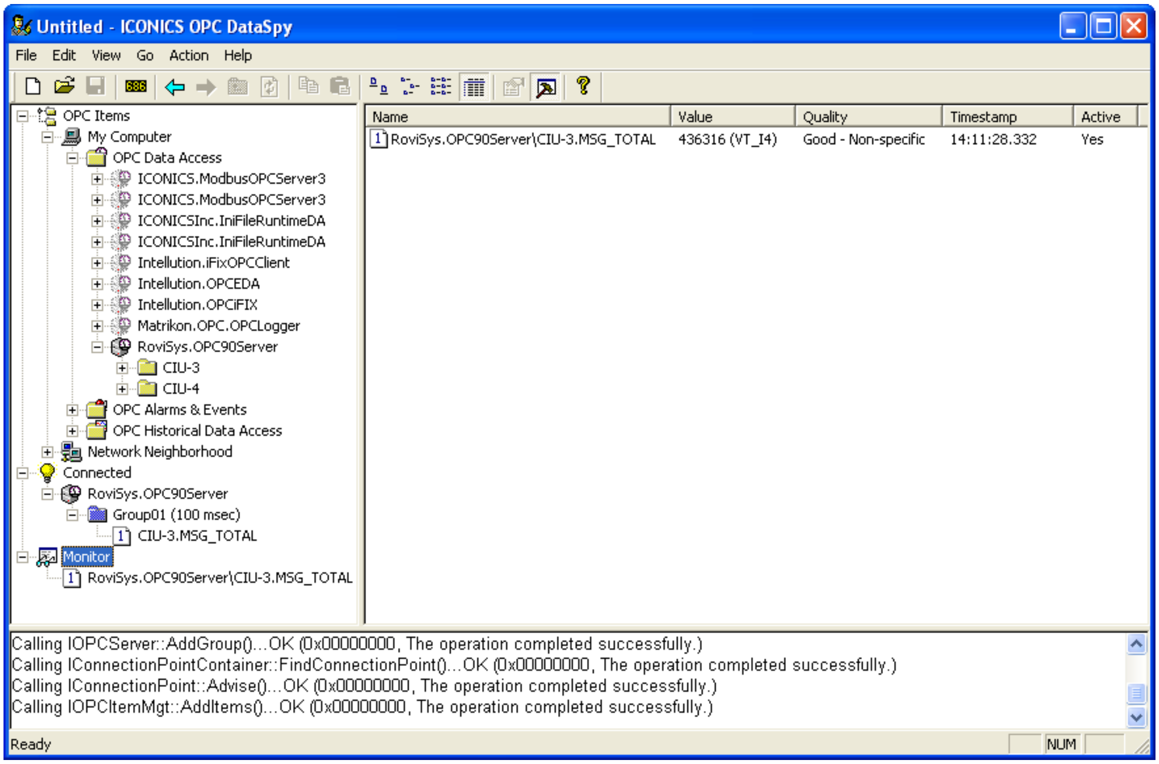
Manually running OPC90 after it has been started as a service or by an OPC client connection will result in a second instance of the program to be observed in Windows Task Manager. This is by design and not an indication of an error condition. Under this condition a progress dialog will be briefly displayed when it is first started, reporting that it is attaching itself to the first instance. Afterwards the second instance becomes a user interface to the first instance.

Warning, manually running OPC90 should not be attempted until after all the OPC clients have been started. Failure to heed this warning could result in an

OPC client connecting with the second instance of OPC90 that is only serving as a user interface to the first instance. Under this situation, that OPC client will not receive the data being collected by the first instance.

Installation of OPC90 includes a test client that can be used to validate local and remote PC client connection with OPC90. This test client is called *DataSpy*. It is installed in the C:\Program Files\OPC90 Server directory. DataSpy supports local and remote server access.

If OPC client connection problems occur, try establishing an OPC connection using the DataSpy OPC client shown by the following dialog. Select "View | Output" so that it will post OPC messages to a list view box at the bottom of its program window. These messages give sufficient details to determine successful / problem operation.



Name	Value	Quality	Timestamp	Active
RoviSys.OPC90Server\CIU-3.MSG_TOTAL	436316 (VT_I4)	Good - Non-specific	14:11:28.332	Yes

```
Calling IOPCServer::AddGroup()...OK (0x00000000, The operation completed successfully.)
Calling IConnectionPointContainer::FindConnectionPoint()...OK (0x00000000, The operation completed successfully.)
Calling IConnectionPoint::Advise()...OK (0x00000000, The operation completed successfully.)
Calling IOPCItemMgt::AddItems()...OK (0x00000000, The operation completed successfully.)
```

For example if an error is posted for the IConnectionPoint::Advise() call, that would be an indication that the OPC90 PC does not have sufficient access privileges to setup call back functions within the OPC client PCs address space. This would indicate a DCOM or user account setup error. Review the DCOM settings. Also remember that if the local and remote PCs are members of a domain, make sure the user account that is running OPC90 and the OPC clients have sufficient privileges (Power Users minimum or Administrator). If the PCs are members of a workgroup, they both must run OPC90 and the OPC clients from user accounts that are the same on both PCs.

10 Troubleshooting Hints

This section is provided to help the user identify and correct problems that may arise as a result of incorrectly setting up the OPC90 Server interface. It is provided as a general guide to allow the user to decipher normal and abnormal operation. If this does not help, OPC90 Server can be enabled to post additional error messages to OPC90 Server log files using the DEVICE block DEBUG_LOG attributes. To change these attributes right mouse click on the Device block and select or deselect Show Receive, Show Send, Show Errors and/or Show Events. Note these flags can be changed in runtime. Remember to save the configuration if these flags are to be saved. Use these DEBUG_LOG attributes to track down tough problems and discover hard to find configuration errors. Afterwards remember to disable all of its options (except Errors), since leaving them enabled can consume large amounts of disk file space.

After installing the OPC90 Server for the first time and thereafter when it is then started up in Monitor mode or when an OPC Client connects to it, the OPC90 Server DEVICE block will automatically begin talking with the Bailey interface. The startup pattern will vary based on the type of Bailey interface being utilized. The first thing you should notice is the Bailey interface serial processing card LEDs begin to sequence. Shortly thereafter you may hear the loop interface termination unit relays click on and off several times as the driver is identifying the Bailey interface type. Just prior to downloading the OPC90 Server block database to the Bailey interface, it will be restarted, and the loop interface termination unit relays will click off isolating it from the communication loop. Next you should observe the Bailey interface serial processing card LEDs sequence at a steady rate as the OPC90 Server block database is being downloaded. Upon completing the database download, the Bailey interface will be commanded on-line, at which time the loop interface termination unit relays will click on and the loop interface card LEDs begin to count loop messages. Thereafter, the Bailey interface serial processing card LEDs will sequence steadily based on the exception report poll interval setup by in the DEVICE block and individual OPC90 Server POLL blocks (when utilized).

If you experience problems with establishing communication between the OPC90 Server and the Bailey interface, if possible, it is a good idea to verify the setup by trying to communicate using the Bailey TXTEWS software. Generally if this software functions OK, you should not experience problems with OPC90 Server.

All Bailey interfaces have a series of four or eight red LEDs on the hardware module that processes serial communication and manages its database. Don't confuse this card with the module that handles the interface with the Bailey communication loop which also has a series of LEDs. An indication that communication with the BAILEY interface is occurring can be determined by looking at the serial processing card LEDs. (Hereafter, these LEDs will be referenced as Bailey interface LEDs.) The Bailey interface LEDs count commands and replies occurring between the OPC90 Server Application Station computer and Bailey interface.

10.1 Validating State Of Individual OPC90 Server Blocks

All OPC90 Server blocks have an attribute called MESSAGE. The purpose of this attribute is to help diagnose the operational state of the block. This attribute cannot be connected to from an OPC Client but can be displayed in Monitor mode in the bottom status pane when the block is selected. This attribute can take on the following messages:

OFFLINE: OPC90 is not currently in monitor mode so the block is not being scanned or OPC90 is unable to communicate with the Bailey interface to receive the block data.

WAITING ON DEVICE: The block is waiting for its associated DEVICE block to complete startup of the Bailey interface and make itself available to the other OPC90 Server blocks.

ESTABLISHING POINT: The block has requested its associated DEVICE to establish the point in the Bailey interface.

WAITING FOR DATA FROM BAILEY: The point has been established in the Bailey interface and is waiting to receive its initial data from the Bailey system.

ONLINE: The block has received its first data update from the Bailey system.

ILLEGAL BLOCK NUMBER: The OPC90 Server AOL or DOL block has been configured with a block number that has exceeded the DEVICE MAX_OUTPUTS attribute setting.

BLOCK ADDRESS ALREADY USED BY ANOTHER BLOCK: Another OPC90 Server block has been configured for the Bailey address set within this block.

EXCEEDED BAILEY INTERFACE INDEX CAPACITY: More OPC90 Server blocks have been configured than can be handled by the Bailey interface.

EXCEEDED OPC90 Server POINT LICENSE: More OPC90 Server blocks have been configured than are allowed by the current license.

10.2 SCSI Port Not Visible In Device Block Properties Comm Port List Box

When the PC is first booted up, the SCSI cards scan their buses to determine what devices are present. OPC90 Server scans each SCSI card device list, looking specifically for Bailey interfaces. SCSI port addresses associated with ABB Bailey interfaces are only posted in the Device block properties primary and secondary communication port list boxes if they were found in the SCSI cards device lists.

1.) Make sure the ABB Bailey SCSI interface is powered up and not in the “red light” condition. Also verify the ABB Bailey SCSI interface is correctly cabled to one of the PC SCSI cards. This cable connects to the Bailey SCSI interface with a standard 50 pin connector and to the back of the PC SCSI card with a high density 50 pin connector (some cards might use a standard 50 pin connector). ABB sells this cable or it can be obtain from a company such as Black Box (www.blackbox.com).

2.) After reviewing step 1 reboot the PC.

10.3 No Communication

If the Bailey interface LEDs do not sequence, this means the driver is not able to successfully communicate with the N90 interface.

3.) Verify the OPC90 Server DEVICE block Primary Port and Secondary Port are associated with the same COM port to which the Bailey interface has been cabled.

4.) Verify the port communication settings match those setup within the Bailey interface. Select Edit | Ports and select the correct port for which to verify.

3.) Verify the Bailey interface device termination unit/module serial port jumpers are setup correctly.

4.) Verify RS232 cable is connected to the correct Bailey termination unit/module connector. Generally this is labeled as the terminal port for the primary channel and printer port for secondary channel when the DEVICE block SCHEME attribute is set to dual channel single interface.

5.) Verify the RS232 cable is connected to the correct PC COM port.

10.4 Appears To Be Communicating But No Data is Being Received

If the Bailey interface LEDs sequence at a very steady and periodic rate this means the server is connected to the Bailey interface but the OPC90 Server DEVICE block communication parameters might not be set correctly. These settings are determined by the DEVICE block's Primary and Secondary port properties. Note that these attributes can be changed while the driver is on-line.

1.) Verify the baud rate settings match between the Bailey interface and COM port the OPC90 Server DEVICE block driver is using.

2.) Verify the parity (usually none) and stop bits (usually 1) match between the Bailey interface and COM port the server is using.

3.) Verify the Bailey interface has checksuming enabled.

If the Bailey interface LEDs are not sequencing but the server indicates good communication status (DEVICE PRI_STATUS or SEC_STATUS is zero).

1.) Verify the COM port associated with the DEVICE is not a modem port.

2.) Verify the pin outs on the serial cable or Bailey interface termination dipshunt settings do not have the TX and RX lines pinned together.

10.5 Not All Blocks Are Receiving Data

1.) Verify the Bailey block addressed by the OPC90 Server block exists and their types match.

2.) Verify "BLOCK ADDRESS ALREADY USED BY ANOTHER BLOCK" is not posted in the MESSAGE attribute in any of the OPC90 Server blocks not receiving data. If such a message is found, you have two or more OPC90 Server blocks pointing to the same address within Bailey. Eliminate the duplication.

3.) Verify "EXCEEDED OPC90 Server POINT LICENSE" is not posted in the MESSAGE attribute in any of the OPC90 Server blocks not receiving data. If such a message is found, you have exceeded the lite version block capacity. Purchase the non-lite version.

5.) Make sure none of the Bailey controllers have addresses less than two.

6.) Indices or memory capacity of the Bailey interface has been exceeded. It is unlikely that you will encounter this error unless your application has a very large number of OPC90 Server blocks and the Bailey interface device is a NCIU01 or INCIC01. Enable the Device DEBIG_LOG error reporting option and search the OPC90 log file messages for such an error.

7.) Memory capacity of the Bailey PCU node has been exceeded, check its status using a OPC90 Server MODSTAT block. Note that this error is extremely rare.

10.6 Random Blocks Are Receiving Bad Quality Indication

1.) Verify the total number of blocks have not exceeded the capacity of the Bailey interface or OPC90 license limit.

2.) When this occurs with data values received via DCOM run DCOMCNFG and delete all of the default protocols out of the Default Protocols list except the "Connection-Oriented TCP/IP" protocol.

10.7 Sporadic Data Transfer of Export Blocks to Bailey

The OPC90 AOL, DOL, ODD, OMSDD, ORCM, ORMC, ORMSC and OSTN blocks are used to export data of the named type to Bailey consoles or controllers. Unfortunately, the ABB Bailey CIU interfaces are primarily designed as data importing devices and handle these export blocks at a much lower priority then the import point types. If the OPC90 database contains a large number of import blocks, the CIU can become so busy processing the incoming exception reports that it never gets around to sending the export block data that OPC90 successfully commanded it to send. For example when the OPC client writes to the OPC90 AOL block IN tag, OPC90 transfers that value to the OUT tag after it has been successfully written to the Bailey CIU. If that value is never received within the Bailey system (or received at significant delays), this signifies the ABB Bailey CIU is overwhelmed with processing import exception reports. There are four possible solutions to this ABB Bailey CIU problem.

3.) Use combinations of OPC90 and Bailey RMSC and RCM blocks to send analog and digital data.

4.) Move the OPC90 export blocks onto a separate ABB Bailey CIU dedicated for these types of blocks.

5.) Upgrade the ABB Bailey CIU to a newer model.

6.) Determine if ABB Bailey has a newer CIU firmware revision that might correct this problem.

10.8 Cannot Export or Control Data Within Bailey

1.) Verify that the Bailey interface device supports this type of activity.

2.) Verify the allowable ranges for the attribute being written match those configured within Bailey. For example you cannot write an OUT value that exceeds the OUT_SCALE limits.

3.) Verify the Bailey interface does not have monitor mode enabled (very unlikely). Monitor mode is set using an ASCII terminal attached to the termination unit/module printer port and that port selected for the utility mode (consult Bailey interface manual). Normally, monitor mode is disabled when a Bailey interface is received from the Bailey factory. It is unlikely that monitor mode is enabled unless someone had attached an ASCII terminal at one time and was "experimenting" with the available options within the Bailey interface utility menus.

4.) Verify the Device is not “locked” by looking at the Device LOCK parameter.

10.9 Cannot see all documented block attributes

Occasionally new attributes are added to a block definition that were not defined in an earlier release of OPC90. If you notice a documented block attribute does not appear when the block is selected it could be a new attribute. One such attribute is RED_TAG. It was added in OPC90 Version 2.1. Configurations saved prior to version 2.1 did not have this attribute defined so therefore it does not automatically appear when the software is upgraded. To make new attributes appear you must export the configuration using the File->export function, request a new configuration using File->new and than import the configuration just exported.

10.10 OPC90 Server Will Not Time Sync Bailey

1.) Verify that the Bailey interface device is not a NSPM01 or NCIU01. These devices do not allow a computer to send time synchronization commands to Bailey. If the Bailey interface device is one of these types, disable time synchronization.

2.) Verify that time synchronization has been enabled. This can be found under the properties of the OPC90 Device block.

3.) For ABB Bailey Network 90 systems, verify that the node map is configured correctly for ALL nodes in the system regardless of whether or not data is being exchanged with any particular node. This can be found under the properties of the OPC90 Device block.

4.) For ABB Bailey Infi 90 systems, time synchronization does not start until after 9 minutes have transpired after OPC90 Server first starts communicating with its interface. This delay is 3 minutes for ABB Bailey Network 90 systems.

5.) The PC running OPC90 Server automatically becomes the time synchronization master whenever its clock is changed by two minutes or more.

6.) Note that OPC90 Server gives precedence to MCS and OIS nodes as becoming the time synchronization master.

10.11 Client Does Not See Any OPC Servers When Browsing Remote PC

A service called OPCEnum must be running on the PC to enable browsing of its OPC servers. Check if this process is running using the Task Manager, process list. If it is running, make sure the Windows “Network access: Let Everyone permissions apply to anonymous users” local security policy is enabled.

The OPC90 install set does not install OPCEnum. It does however include the OPC Foundation Core Components installation MSI file. This file can be found in the C:\Program Files\OPC90 Server\OPC Foundation directory. Double click on the .MSI file to install these core components which includes the OPCEnum program.

Afterwards, from a command prompt type OPCEnum /Service to install OPCEnum as a service. Depending on the operating system a reboot of the PC might be necessary. The DCOM settings of OPCEnum might also need to be adjusted.

10.12 Client Connects But Does Not Receive Data

Improper DCOM settings can cause multiple instances of OPC90 to run on the local PC. Only the first instance can communicate with the Bailey interface. Verify that a single OPC90 process is displayed in the task manager process list. Note that when OPC90 when a user runs OPC90 manually it may run as a second instance. This is normal. If multiple OPC90 processes still show up in the task manager list after the manually run instance is exited, improper DCOM settings are causing this problem.

10.13 Viewing Data in Monitor Mode Does Not Work

1.) Verify the Bailey interface does not require a physical reset. Click on the Device block and look for this message in the program status section (lower right side of the program window).

2.) Verify "Data does not exist in first program instance" is not being displayed in the program status section. This message indicates the OPC90 service or embedded instance is not in sync with the second instance. This error is rare but could occur if database changes were made and not saved. Stop and start the OPC90 service.

10.14 Writing RMSC Blocks Cause Controller or Node Offline Condition

A problem exists with ABB Bailey backup controllers or nodes going offline when many writes to RMSC blocks occur. The solution is to limit the number of writes to RMSC blocks to one per second. A common mistake is to use RMSC blocks to exchange values generated by OPC clients and ABB Bailey controllers. This solution is wrong and bypasses the exception report mechanisms that are built into the ABB DCS. The correction implementation is to use OPC90 AOL and DOL blocks linked to ABB Bailey AI/I (FC 121) and DI/I (FC 122) blocks.

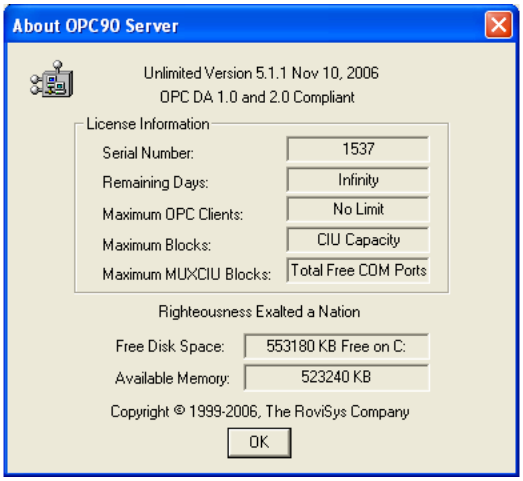
10.15 Last Saved Database Not Automatically Restored On Program Start

1.) Verify the last database was saved before exiting OPC90. Run OPC90, select the database and select File->Save. Exit the program and run it again to verify the database is automatically restored.

2.) Make sure the user account OPC90 is running in includes the power user group. This is especially critical when running under Microsoft Windows Server.

10.16 Data Updates Stop After 2 Hours

The demo version of OPC90 will only provide data updates for 2 hours each time it is started. If the demo version is being utilized, contact RoviSys to purchase a licensed copy of OPC90. If a licensed copy of OPC90 is installed and the data updates stop after 2 hours, the problem is the hardware protection key (dongle) is not being recognized. Make sure a device block has been configured. OPC90 does not look for its key if no device blocks are configured in the database. If that is not the problem, make sure the dongle is properly installed. Select the OPC90 program menu option Help | About and verify it reports the dongle serial number in the first line of the about dialog. If the dongle is not being recognized or the demo version is being used, that line will only state the program version number and release date. If the demo version was being utilized prior to purchasing a licensed copy, it must be uninstalled and the licensed copy installed.



About OPC90 Server

Unlimited Version 5.1.1 Nov 10, 2006
OPC DA 1.0 and 2.0 Compliant

License Information

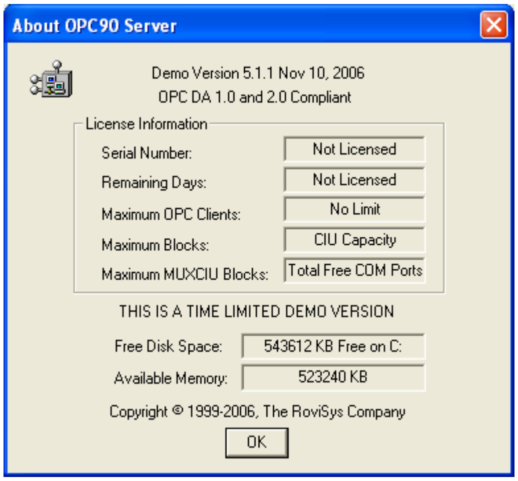
Serial Number: 1537
Remaining Days: Infinity
Maximum OPC Clients: No Limit
Maximum Blocks: CIU Capacity
Maximum MUXCIU Blocks: Total Free COM Ports

Righteousness Exalted a Nation

Free Disk Space: 553180 KB Free on C:
Available Memory: 523240 KB

Copyright © 1999-2006, The RoviSys Company

Licensed Version Help | About



About OPC90 Server

Demo Version 5.1.1 Nov 10, 2006
OPC DA 1.0 and 2.0 Compliant

License Information

Serial Number: Not Licensed
Remaining Days: Not Licensed
Maximum OPC Clients: No Limit
Maximum Blocks: CIU Capacity
Maximum MUXCIU Blocks: Total Free COM Ports

THIS IS A TIME LIMITED DEMO VERSION

Free Disk Space: 543612 KB Free on C:
Available Memory: 523240 KB

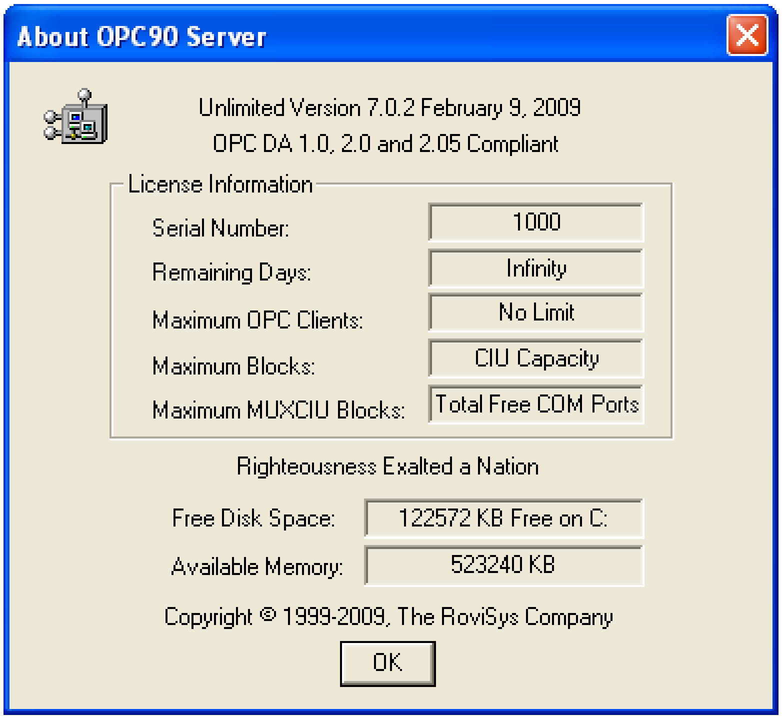
Copyright © 1999-2006, The RoviSys Company

Demo Version Help | About

Note that if the dongle was not properly installed, OPC90 must be restarted after the dongle is installed. If the dongle has been properly installed but OPC90 still is not recognizing it, the Sentinel Protection Installer program must be re-run. The OPC90 setup program normally runs this setup but on some systems it has been observed to occasionally fail. This program can be found in the C:\Program Files\OPC90 Server\SuperPro directory. Stop OPC90 and run the Sentinel Protection Installer program. Restart OPC90 and verify it now correctly reports the dongle serial number. If not, try rebooting the PC and checking it again. If that doesn’t work contact RoviSys regarding replacement of the dongle.

10.17 Data Updates Stop After 8 Hours

An OPC90 license is being used that has not been paid for. Some OPC90 hardware keys are shipped with a licensed number of days the server is allowed to run. Failure to pay for the server within that amount of time causes the license to expire. Expired licenses will only communicate with the ABB Bailey system for eight hours each time OPC90 is restarted. Check the Help | About menu option to verify this has happened. When the serial number is displayed and the remaining days indicate zero, the license is expired.



Unlimited Version 7.0.2 February 9, 2009

OPC DA 1.0, 2.0 and 2.05 Compliant

License Information

Serial Number:	1000
Remaining Days:	Infinity
Maximum OPC Clients:	No Limit
Maximum Blocks:	CIU Capacity
Maximum MUXCIU Blocks:	Total Free COM Ports

Righteousness Exalted a Nation

Free Disk Space: 122572 KB Free on C:

Available Memory: 523240 KB

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If the software has been purchased directly from RoviSys, please ask your company's accounts payable department payment to issue payment. If the software was purchased from a reseller, please contact them about why they have not paid for the software. Once payment is received by RoviSys, the license day limit will be removed. Until that occurs, restart OPC90 every 8 hours. Note that the hardware key does not have to be returned to RoviSys. The license update is handled via email. A license update file is emailed. This file is used to immediately update the hardware key to remove the day limit.

10.18 SCSI Addresses Different Between Two Shadowed PCs

The SCSI address of ABB Bailey INICT03A/13A modules must be identical between shadowed OPC90 PCs. The address assigned to SCSI devices has three components which are port number, card number and device on that card. For example the address S2107 indicates port two, card one and device seven. Windows automatically assigns the port number based on when new hardware is added. Therefore, sometimes this port number assignment can end up being different between two PCs based on the order in which new hardware is discovered. If this occurs between redundant application stations use the following procedure to re-align the port address.

Using Regedit go to the key named HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\Scsi in the registry. Find the branch that contains the Bailey interface. Click the Scsi Port # at the top of the branch and look for the Driver name.

Go to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\drivername for both the device ahead of you and for the SCSI device you want to be first and look at the TAG value. You need to change the tag value so that the device you want listed first (as S1000) is a lower value than the device that is forcing it to S2000:.

Detailed explanation of what this procedure accomplishes follows as gleaned from the Microsoft web site:

```
Tag REG_DWORD Specifies a load order within a given group.
The value of Tag specifies a number that is unique within
the group of which the service is a member. The related
GroupName entry under the Control\GroupOrderList subkey
specifies a list of tags, in load order. For example, the
following services that are members of the Primary Disk
group could have these values: Tag=4 for the Abiosdsk
subkey, Tag=2 for Atdisk, Tag=1 for Cpqarray, and Tag=3 for
Floppy. The value for Primary Disk under the GroupOrderList
subkey will use these Tag values to specify the defined
order for loading these services. As another example, each
SCSI miniport service has a unique Tag value that is used as
an identifier in the SCSI miniport value under the
GroupOrderList subkey to define which SCSI adapter to load
first.
```

10.19 OPC90 Running as a Service Randomly Stops or Crashes

RoviSys has taken every effort to develop a “bug” free OPC server. Nevertheless sometimes unforeseen problems exist caused by loading, random hardware glitches or other factors such as misbehaving OPC client software. These types of problems are usually very difficult to duplicate and isolate. Make sure the Windows Dr. Watson program is active on the system. Email the Dr. Watson log to RoviSys for analysis. Often the file does not contain enough useful information to find the root cause of the problem. Only after RoviSys recommendation, try installing the debug version of OPC90 Server. Consult the README file in the C:\Program Files\OPC90 Server\DEBUG directory for further instructions.

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