



What data is read and when by Automatic Batch Data Collection (ABDC)?

ABDC collects three types of Batch information (See the FAQ on What data is read by ABDC and from where for more details).

Whenever the ABDC services starts the following occurs in the order defined below:

1. The connection with the Exaopc/Batch server is first confirmed. This uses a mechanism known as the OPC Health Check. If this fails it will continue to monitor until a connection is possible. The service does not continue past this point if the Health Check Fails. It is also worth point out at this point that the Health Check thread continues to monitor the connection whilst the service is running and should the connection drop will terminate all active threads until such time as the connection is restored. This effectively reinitializes the service to a known position in order that catchup will ensure any missed data is collected once the connection is restored.
2. If the OPC connection is OK ABDC will then start Equipment Reconciliation. This thread that continues to run once a minute by default processes the OPCBPhysicalModel node of the Exaopc/Batch address space to ensure that any changes in the equipment hierarchy is recorded. ABDC will process Area, Process Cells and Units configured in the Custom Plant of the Control System. (See the FAQ what must be configured on the Control Station in order for Exaquantum/Batch Automatic Batch Data Collection to collect all the information for details). All real units will also be registered with the Exaopc\Batch Server in order that usage statistics can be recorded.
3. ABDC will then start the Master Recipe Collection Thread. On start up all configured master recipes will be read and checked to see if anything has changed during the time that ABDC was down. It then starts the Master Recipe Download Monitors on all the configured Batch HIS's configured for the 16 supported recipe groups. Whenever a new or changed master recipe is downloaded ABDC will read the details from the Engineering workstation where the recipe management package is installed. Batch and Unit Recipe names, properties and formula item (common block) names and default values are collected as well as Operation Names. Lower levels (Phases etc.) of the batch model are ignored.

Finally ABDC will start Batch List Polling. Batch List Polling occurs on a maximum frequency of once every 10 seconds by default. The actual frequency will depend on how much work this thread has to do as it does not poll whilst it is processing the list. The job of the Batch List Polling mechanism is to check for new batches and batches that have been deleted from the control system. All batches listed in the Recipe Overview (.RO) screens for each of the 16 supported recipe groups will appear in this list. This list is read from the OPCBBatchIDList node of the Exaopc/Batch address space. ABDC stores the last read batch list in the AutoBDCBatchList table in the QBatch database. In general the Batch Name or ID is not unique and therefore in order to check to see whether a batch on the batch list is known or whether it is new ABDC will read the schedule time of the batch during each polling cycle for each batch on the list. The wrong batch property will also be read (see he FAQ What does the



“Error Reading Wrong Batch Property Data” Error in the Application Event log mean for details of the Wrong Batch Property).

Note it is possible for ABDC to read a partial list depending on whether the Batch HIS managing that recipe group is available. This can also occur during the time a switch is made from the Master to the Standby Batch Server. If this should occur then affected batches will be marked offline. Once a new list has been received the offline batches should have their current status recorded.

If a batch appears in the AutoBDCBatchList but not on the OPC Batch List then it has been deleted from the DCS. ABDC will removed it from the AutoBDCBatchlist and assign the DELETED status to the batch.

Note When a Batch is already marked as deleted it will be ignored even if it apparently reappears on the Batch List.

If a batch appears in the OPC Batch List but not on the AutoBDCBatchList and an entry for that batch is not already present but marked as DELETED it is considered a new batch and will be added to the AutoBDCBatchList and an entry in the various tables in the QBatch database populated with initial values.

All active batches and unit recipes will then be registered with the OPC Server in order that status changes can be monitored. This is used to trigger batch end and unit recipe end processing as well as collection of statistics such as batch metrics and equipment usages.

Once the processing of one poll completes another poll will start within 10 seconds. The maximum poll rate is set in the database but in most cases never needs changing.

Once polling has started normal operation is multi-threaded and consists of the following:-

1. Batch List Processing – every 10 seconds max.
2. Batch and Unit Recipe status change processing – Event Driven from the OPC server.
3. Equipment Reconciliation – every 1 minute max.
4. Physical Unit status change processing – Event Driven from the OPC Server.
5. Master Recipe change processing – Event Driven from HIS file watchers.



When a new batch is detected no assumptions are made as to the state of the batch and all parameters for the Batch and all its Unit Recipes are collected. That is everything that appears under OPCBatchModel.<BatchID> in the OPC address space. Once this information is persisted to the database a registration will be made on the OPC Server in order that changes in the Batch and Unit Recipe Status can be recorded.

An initial call back from the OPC server will provide the current status of Batch and Unit Recipes which will result in the collection of the actual start time property of already active batches and unit recipes.

If the initial call back shows that a Unit Recipe or Batch has already been completed then Batch End processing and/or Unit Recipe End processing will be initiated.

On Unit Recipe Start the Actual Start Time of the Unit Recipe is read.

On Unit Recipe End the Actual End Time of the Unit recipe is read together with all the Formula Items which have been assigned to that unit recipe. ABDC will also schedule any Unit Recipe End reports and process Unit Recipe Metrics.

On Batch End all the properties configured for the Batch are reread. ABDC will also schedule any Batch End report and process Batch Metrics.

Changes to Batch Properties can be viewed by using the BatchPropertyHistoryReportView.

Exaquantum /Batch Releases Affected

All
