

Description: Guide to fine tune Hyper Historian with advanced settings

OS Requirement: Windows Server 2003 x64/Vista x64/ Server 2008 x64/Windows 7 x64/Server 2008 x64 R2

General Requirement: General understanding of logging data and databases

Introduction

Hyper Historian is a powerful, 64-bit, high performance plant historian. It includes a high compression, advanced Swinging Door algorithm to decrease database size. Although it takes advantage of 64-bit hardware and software architectures, which allows it to access more CPU power and memory than traditional 32-bit-based historians do, it still leaves a very small memory footprint compared to its counterpart TrendWorX64 Logger, and provides higher performance.

Its key features include:

- OPC-UA, OPC-DA and OPC-HDA Compliance
- Optimistic Concurrent Multi-user Configuration
- Web-based Configuration and Administration
- Integrated Redundancy

For an introduction to the Hyper Historian, review the application note called *Hyper Historian - Introduction to Hyper Historian*. In this document, we detail some of the more advanced settings related to Hyper Historian.

Configuring Hyper Historian Advanced Settings

Hyper Historian is configured through Workbench64, a centralized project management application for GENESIS64.

1. To open the Workbench, go to **Start → All Programs → ICONICS GENESIS64 → Workbench**.
2. Once you are in Workbench64, select Hyper Historian in the Project Explorer.
3. After selecting Hyper Historian, you will be able to see the “localhost” as a node, and can expand it.
4. Select System Administration → System Settings to open the Hyper Historian Advanced Configuration Settings.
5. This open window shows basic license settings and disk space manager settings.
6. The Hyper Historian is available in two major editions; if you have the Enterprise edition, you can choose a license mode.
 - **Standard Edition.** The Standard Edition is optimized for a single PC/workstation system where the entire Hyper Historian is running on one machine.

- **Enterprise Edition.** The Enterprise Edition is optimized for performance in a distributed data collection environment where the data collection is performed on separate machines, not on the PC/workstation running the Logger.

Both editions support connectivity, data collection and logging, archiving, and data playback capabilities of the Hyper Historian. In addition to supporting these core capabilities, the Enterprise edition supports remote distributed data collection, redundancy (both at the collector level and the data logger/database level), store and forward capability, and optimization for multi-core and multi-processor systems.

Users of the Hyper Historian **Enterprise Edition** can run the Hyper Historian Logger in **Enterprise** or **Standard** mode if the Hyper Historian is running on a single PC/workstation (a non-redundant single workstation). Running the system in Standard mode provides better logging performance and the possibility of achieving high throughput rates on a single-PC solution.

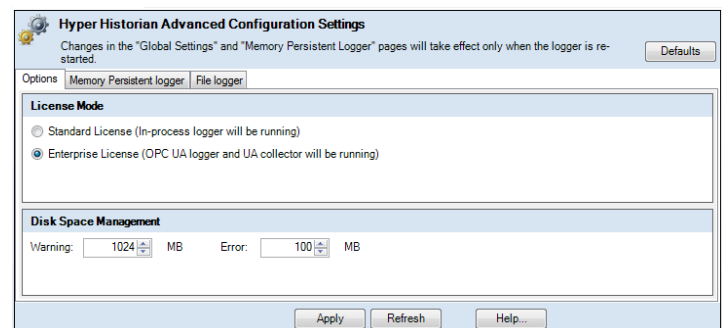


Figure 1 - Hyper Historian Advanced Settings

7. In the **Disk Space Management** section, you can configure when the system will send a Warning or Error message depending on the configurable disk space limit.
8. Select the **Memory Persistent logger** or the **File logger** to configure the advanced setting.

Caching is used in collectors to house data received from lower processing levels and in preparation for forwarding to the core. When data is received from processing levels, it is stored to a cache (as much as possible due to space requirements), or forwarded to storage. When a client (UA layer, core local communication layer) requests data, the cache is used as a data source. When the client confirms it has received the data, cached counterparts are removed and the cache gets backfilled.

Various Parameter Names and Descriptions are provided, along with the ability to change the Value Type between Boolean, Numeric and Text. The default Value Type is set as Numeric for

most of the parameters. Depending on the selection, you can check whether you want to include a Boolean Value, enter a Numeric Value or enter a Text Value.

NOTE: The advanced settings are quite advanced. If you are not an expert, we recommend that you do not change these settings.

Memory Persistent Logger

Tuning Settings

- *Shadow Flush Time (s)* – specifies how often the modified content of memory / files is written to disk
- *Memory Only Index Cache Size (MB)* – specifies the cache size for index blocks
- *Memory Only Data Cache Size (MB)* – specifies the cache size for data blocks

Options Memory Persistent logger File logger		
The following settings apply to all the memory persistent loggers defined.		
General Tuning Advanced		
Parameter Name	Description	Numeric Value
Shadow Flush Time (s)	Specifies how often cache content for modified file is flushed to disk (i.e. how often disk and memory are synchronized).	300
Index Cache Size (MB)	Specifies the cache size in MB dedicated to index blocks.	50
Data Cache Size (MB)	Specifies the cache size in MB dedicated to data blocks.	75
Memory Only Index Cache Size (MB)	Specifies the cache size in MB dedicated to index blocks for memory only logging.	50
Memory Only Data Cache Size (MB)	Specifies the cache size in MB dedicated to data blocks for memory only logging.	75

Figure 2 - Memory Persistent Logger: Tuning

Advanced Settings

- *Maximum Pending Requests* – specifies the maximum number of pending insert requests
- *Sealed File Keep Time (s)* – specifies how long a file is kept in logger
- *Close Check Frequency (s)* – specifies how often the files are scanned if they could not be closed (start time/end time)
- *Seal Check Frequency (s)* – specifies how often the files are scanned which should be closed
- *Detach Check Frequency (s)* – specifies how often the files are scanned and if they might NOT be detached from the system
- *Block Snapshot Enabled* – specifies if the requests should be backup or confirmed

Parameter Name	Description	Value Type	Boolean Value	Numeric Value
Maximum Pending Requests	Defines maximum number of pending insert requests in logger before logger starts to reject incoming requests.	Numeric	☐	1000000
Sealed File Keep Time (s)	Specifies how long a file is kept in logger once it meets detach condition.	Numeric	☐	600
Close Check Frequency (s)	Specifies how often file close conditions are being checked.	Numeric	☐	30
Seal Check Frequency (s)	Specifies how often file seal conditions are being checked (file is sealed when it meets detach condition and is eligible to be removed from logger).	Numeric	☐	120
Detach Check Frequency (s)	Specifies how often file unmount conditions are being checked (file is unmounted when it is sealed and configured time - SealedFileKeepTime - passes since its sealing).	Numeric	☐	120
Block Snapshot Enabled	Specifies, whether the logger backs up incoming data package to disk before confirming the package reception to client. (When off and logger terminates prior to processing those pending requests, package data may be lost as logger itself is not redundant and processing is asynchronous.)	Boolean	☐	0

Figure 3 - Memory Persistent Logger: Advanced

File Logger

Cache Settings

- *Flush Time* – specifies the time interval after which the cache is cleared
- *Full Garbage Collection Period* – clear Garbage Collector and changes write into disc
- *Maxim Cache Size (MB)* – specifies the maximum cache size
- *Maximum Unused Data Blocks Lifetime* – specifies the maximum lifetime on unused data blocks, recycled faster
- *Maximum Unused Index Blocks Lifetime* – specifies the maximum lifetime on unused index blocks, kept longer

Options Memory Persistent logger File logger		
The following settings apply to all the file based loggers defined		
Cache Logger Master Logger Logger Data Store Master Logger Data Store		
Parameter Name	Description	Numeric Value
Flush Time (sec)	Specifies the time interval (in seconds) after which the cache is cleared.	60
Full Garbage Collection Period (min)	Specifies the time interval (in minutes) after which a full garbage collection is executed.	1
Maximum Cache Size (MB)	Specifies the maximum cache size in megabytes.	0
Maximum Unused Data Blocks Lifetime (sec)	Specifies the maximum lifetime (in seconds) of unused data blocks.	60
Maximum Unused Index Blocks Lifetime (sec)	Specifies the maximum lifetime (in seconds) of unused index blocks.	3600

Figure 4 - File Logger: Cache

Logger Configuration Settings

- *Operation Retry Interval* – specifies a time interval before the logger re-tries a failed operation again
- *Max Operation Queue Length* – specifies maximum operation queue length
- *Priority Increment Period* – specifies how often to increase the priority
- *Operation Queue Priority Count* – impact the priority settings in the operation queue

Options Memory Persistent logger File logger		
The following settings apply to all the file based loggers defined		
Cache Logger Master Logger Logger Data Store Master Logger Data Store		
Parameter Name	Description	Numeric Value
Operation Retry Interval (sec)	Specifies the time interval (in seconds) after which the logger attempts to re-execute a failed operation.	10
Maximum Operation Queue Length	Specifies the maximum operation queue length.	1000
Priority Increment Period (ms)	Specifies the time period (in milliseconds) after which queue priority is increased.	250
Operation Queue Priority Count	Specifies the count of priorities in the operation queue.	20

Figure 5 - File Logger: Logger

Master Logger Configuration Settings

- *Alternative Data Index Directory* – specifies an alternative directory path used to store data indices
- *Archive Data Store Directory* – specifies the directory path used to store archive data
- *Data File Extension* – specifies the extension for logged data files; the default is “hhi”

- *Index File Extension* – specifies the extension for index files; the default is “hhd”
- *Data Store Directory* – specifies the directory path used to store logged data
- *Master Logger Directory* – specifies the directory path for master logger
- *Master Logger File* – specifies the path name of the master logger binary file
- *Maximum Online Loggers Count* – specifies the maximum count of online loggers allowed
- *Maximum Inactivity Period (min)* – Specifies the maximum inactivity period allowed for master logger
- *Operation Retry Time* – specifies the time interval to re-execute a failed operation of master logger

Options Memory Persistent logger File logger				
The following settings apply to all the file based loggers defined				
Cache Logger Master Logger Logger Data Store Master Logger Data Store				
Parameter Name	Description	Value Type	Numeric Value	Text Value
Alternative Data Index Directory	Specifies an alternative directory path used to store data indices.	Text	0	
Archive Data Store Directory	Specifies the directory path used to store archive data.	Text	0	
Data File Extension	Specifies the extension for logged data files.	Text	0	hhd
Data Store Directory	Specifies the directory path used to store logged data.	Text	0	
Index File Extension	Specifies the extension for index files.	Text	0	hhi
Master Logger Directory	Specifies the directory path of the master logger.	Text	0	
Master Logger File	Specifies the pathname of the master logger binary file.	Text	0	Datastores.bin
Maximum Online Loggers Count	Specifies the maximum count of online loggers allowed.	Numeric	100	
Maximum Inactivity Period (min)	Specifies the maximum inactivity period (in minutes) allowed for the master logger.	Numeric	10	
Operation Retry Interval (sec)	Specifies the time interval (in seconds) after which the master logger attempts to re-execute a failed operation.	Numeric	10	

Figure 6 - File Logger: Master Logger

Logger Data Store Configuration Settings

- *Data File Buffer Size* – specifies the size of the data file buffer
- *Index File Buffer Size* – specifies the size of the index file buffer
- *Data Slot Size* – specifies the size of the data slot
- *Index Slot Size* – specifies the size of the index slot
- *Value Reservation* – specifies values reservation as a percentage
- *Value Split Size* - specifies values split size as a percentage

Options Memory Persistent logger File logger		
The following settings apply to all the file based loggers defined		
Cache Logger Master Logger Logger Data Store Master Logger Data Store		
Parameter Name	Description	Numeric Value
Data File Buffer Size (KB)	Specifies the size (in kilobytes) of the data file buffer.	5120
Data Slot Size (KB)	Specifies the size (in kilobytes) of the data slot.	4
Index File Buffer Size (KB)	Specifies the size (in kilobytes) of the index file buffer.	512
Index Slot Size (KB)	Specifies the size (in kilobytes) of the index slot.	8
Value Reservation (%)	Specifies values reservation as a percentage.	4
Value Split Size (%)	Specifies values split size as a percentage.	60

Figure 7 - File Logger: Logger Data Store

Master Logger Data Store Configuration Settings

- *Data Slot Size* – specifies the size of allocation unit
- *Index Slot Size* – specifies the size of the index slot
- *Data File Buffer Size* – specifies the size of data file buffer
- *Index File Buffer Size* - specified the size of the index file buffer
- *Value Reservation & Value Split Size* – reserve in slots for future updates

Options Memory Persistent logger File logger		
The following settings apply to all the file based loggers defined		
Cache Logger Master Logger Logger Data Store Master Logger Data Store		
Parameter Name	Description	Numeric Value
Data File Buffer Size (KB)	Specifies the size (in kilobytes) of the data file buffer.	5120
Data Slot Size (KB)	Specifies the size (in kilobytes) of the data slot.	4
Index File Buffer Size (KB)	Specifies the size (in kilobytes) of the index file buffer.	512
Index Slot Size (KB)	Specifies the size (in kilobytes) of the index slot.	4
Value Reservation (%)	Specifies values reservation as a percentage.	5
Value Split Size (%)	Specifies values split size as a percentage.	60

Figure 8 - File Logger: Master Logger Data Store