

# openXDA Configuration

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## User Roles

- **Admin Role** – This role has access to all features and settings within open XDA.
- **Engineer Role** – This role has access to the edit and delete features for events and disturbances listed under the ddWorkbench, but does not have access to general settings.
- **Viewer Role** – This role has only access to view the sites but cannot change any settings or delete/edit any data.

## Service Configuration

Apart from the connection string in the **openXDA.exe.config** file, configuration options for the service are located in the database in a table called **Setting**. These are the configuration options that can be defined in the Setting table.

- **Breakers.ApplyDCOffsetLogic**
  - Default: False
  - Indicates whether to apply additional logic to help obtain more accurate breaker timing results in cases where DC current gradually drains from the line after the breaker is open.
- **Breakers.DCOffsetWindowSize**
  - Default: 1.125
  - The size of the window, in cycles, to use when applying the DC offset logic.
  - The logic detects cases where the window contains no zero crossings. In other words, if all the values in the window are positive or negative, then it is identified as DC offset and breaker timing uses the last zero crossing before the DC offset.
- **Breakers.LateBreakerThreshold**
  - Default: 1.0
  - The maximum number of cycles that a breaker operation's timing can exceed the configured breaker speed before being considered late.
- **Breakers.MaxCyclesBeforeRestrike**
  - Default: 2.0
  - The maximum number of cycles a breaker can remain open before the occurrence can no longer be classified as a restrike.

- **Breakers.MinCyclesBeforeOpen**
  - Default: 0.0
  - The minimum number of cycles that the breaker is expected to remain closed after receiving the trip coil energized signal.
  - This value helps prevent phase timing calculations when the current signal is not large enough to detect the point at which the breaker opened.
  - Increasing this value can help to detect situations where the value of the current is straddling the breaker open threshold, but increasing it too much can cause false negatives.
- **Breakers.MinCyclesBeforeRestrike**
  - Default: 0.125
  - The minimum number of cycles a breaker must remain open in order for the occurrence to be considered a restrike.
- **Breakers.MinWaitBeforeReclose**
  - Default: 15.0
  - The minimum amount of time, in cycles, the system must wait before automatically reclosing after a breaker operation has occurred.
  - This setting is used for breaker operation analysis to detect status point chatter.
- **Breakers.OpenBreakerThreshold**
  - Default: 20.0
  - The maximum current, in amps, at which the breaker can be considered open.
  - This threshold is compared against the amplitude (peak) of the sine wave fitted to each cycle of the current waveform using linear regression. A flat, noisy signal should produce a very low amplitude sine wave.
- **COMTRADEMinWaitTime**
  - Default: 15.0
  - The minimum amount of time, in seconds, to wait for additional data files after the system detects the existence of a .d00 COMTRADE file.
  - The best way to ensure that all data files are present before openXDA attempts to process them is to copy the data files first, then copy the .cfg file last.
- **COMTRADEUseRelaxedValidation**
  - Default: False
  - Indicates whether to use relaxed validation when processing COMTRADE schema files.

- **DbTimeout**
  - Default: 120
  - Amount of time each database query is given to complete, in seconds.
- **DefaultDisturbanceEnvelope**
  - Default: 1
  - The ID of the voltage envelope to use by displays when querying disturbance severity data for visualization.
- **DefaultMeterTimeZone**
  - Default: UTC
  - The time zone identifier for the time zone used by meters in the system unless explicitly configured otherwise.
  - See [https://msdn.microsoft.com/en-us/library/ms912391\(v=winembedded.11\).aspx](https://msdn.microsoft.com/en-us/library/ms912391(v=winembedded.11).aspx) for the list of Windows time zone identifiers.
- **Email.EnableSSL**
  - Default: False
  - Flag that determines whether to enable SSL when establishing communications with the SMTP server.
- **Email.AdminAddress**
  - Default: [xda-admin@gridprotectionalliance.org](mailto:xda-admin@gridprotectionalliance.org)
  - The email address of the administrator of the email system who receives system notifications for taking administrative actions, such as self-subscription approval and restoration of the email system after tripping the email flooding detection logic.
- **Email.BlindCopyAddress**
  - The email address placed on the To line when blind-copying email recipients.
  - Leave this field blank to disable blind-copy.
- **Email.FromAddress**
  - Default: openXDA@gridprotectionalliance.org
  - The email address placed on the From line of the emails sent when a fault is detected.
- **Email.Password**
  - The password used to authenticate to the SMTP server.
  - Remove this field from system settings if no authentication is required.

- **Email.SMTPServer**
  - The hostname or IP address of the SMTP server used for sending emails when a fault is detected.
- **Email.Username**
  - The username used to authenticate to the SMTP server.
  - Remove this field from system settings or leave it blank if no authentication is required.
- **EMAX.ApplyTimestampCorrection**
  - Default: True
  - Flag that determines whether timestamp correction should be applied when reading native EMAX files.
- **EMAX.ApplyValueCorrection**
  - Default: True
  - Flag that determines whether value correction should be applied when reading native EMAX files.
- **EMAX.COMTRADEExportDirectory**
  - The path to the directory where COMTRADE exports should be located after reading an EMAX native file.
  - Remove this field from system settings or leave blank to disable the COMTRADE export.
- **EventEmail.Enabled**
  - Default: False
  - Flag that determines whether the system will send event-triggered emails.
- **EventEmail.MaxEmailCount**
  - Default: 0
  - The maximum number of emails the system should send within the time range specified by MaxEmailSpan before automatically stopping the email processor.
  - Values less than or equal to zero will disable this functionality.
- **EventEmail.MaxEmailSpan**
  - Default: 0
  - The number of seconds that defines the time range over which emails will be counted to compare with the MaxEmailCount in order to detect email flooding.
  - Values less than or equal to zero will disable this functionality.

- **FaultLocation.FaultCalculationCycleMethod**
  - Default: MaxCurrent
  - Determines which method to use to find the representative fault cycle for reporting fault analysis results.
  - Valid methods:
    - MaxCurrent
    - LastFaultedCycle
  
- **FaultLocation.FaultClearingAdjustmentSamples**
  - Default: 10
  - The number of samples by which the calculation cycle will be adjusted for single-phase faults using the LastFaultedCycle calculation method to help ensure that errors in the algorithm to determine fault clearing time do not bring about errors in the selected fault distance calculation.
  
- **FaultLocation.FaultedVoltageThreshold**
  - Default: 0.8
  - The per-unit RMS voltage value, in volts, under which a phase will be considered faulted when using voltage-based fault analysis.
  
- **FaultLocation.GroundedFaultVoltageThreshold**
  - Default: 0.001
  - The per-unit RMS voltage value, in volts, over which the zero sequence voltage indicates that ground was involved in the fault when using voltage-based fault analysis.
  
- **FaultLocation.MinFaultSegmentCycles**
  - Default: 0.1
  - The minimum number of cycles that a fault type must be sustained to be determined a valid fault segment.
  
- **FaultLocation.MaxFaultDistanceMultiplier**
  - Default: 1.05
  - The multiplier applied to the line length to determine the maximum value allowed for fault distance before the results are considered invalid.
  
- **FaultLocation.MinFaultDistanceMultiplier**
  - Default: -0.05
  - The multiplier applied to the line length to determine the minimum value allowed for fault distance before the results are considered invalid.

- **FaultLocation.PrefaultTrigger**
  - Default: 5.0
  - The threshold at which the ratio between RMS current and pre-fault RMS current indicates faulted conditions.
  - If the ratio exceeds this threshold, the cycle is considered to have been recorded during a fault, but only if the fault suppression algorithm indicates that there is no reason to believe otherwise.
  
- **FaultLocation.PrefaultTriggerAdjustment**
  - Default: 50.0
  - The offset, in amps, to suppress fault detection in records with pre-fault data that does not contain load current.
  
- **FaultLocation.UseDefaultFaultDetectionLogic**
  - Default: True
  - Indicates whether to use the default fault detection logic when the line-specific fault detection logic fails or is not defined.
  - The default fault detection logic will only be applied if the system encounters errors during line-specific fault detection, but not if the line-specific fault detection does not detect a fault.
  
- **FaultLocation.WarnMissingDetectionLogic**
  - Default: False
  - Indicates whether to generate warning messages in the openXDA Console and log files if the fault detection logic is not explicitly defined for a given line.
  
- **FilePattern**
  - Default: (?<AssetKey>[^\s]+)\s[^\s]+\$
  - Regular expression pattern that defines how files are associated with their meters.
  - A capture group for **AssetKey** must be specified.
  - See [http://msdn.microsoft.com/en-us/library/az24scfc\(v=vs.110\).aspx](http://msdn.microsoft.com/en-us/library/az24scfc(v=vs.110).aspx) for more information about regular expression in .NET.
  
- **FileProcessorID**
  - Default: 4E3D3A90-6E7E-4AB7-96F3-3A5899081D0D
  - ID of the file processor which determines the name of the file backed lookup table.
  - Updates to this setting require a full restart of the openXDA service.

- **FileShares**

- A double semicolon-separated list of connection strings that define the credentials required for the service to connect to a file share.
- Each connection string should contain 3 settings: Name, Username, and Password.
  - **Name:** The name of the file share ([\\server\share](#)).
  - **UserName:** The name of the user to log in as (DOMAIN\USERNAME).
  - **Password:** The password of the user to log in as.
- Alternatively, each file share can be defined as three separate settings in the Setting table.

<b>Name</b>	<b>Value</b>
FileShares.1.Name	\\server1\share
FileShares.1.Username	DOMAIN1\USER1
FileShares.1.Password	user1pwd
FileShares.2.Name	\\server2\share
FileShares.2.Username	DOMAIN2\USER2
FileShares.2.Password	user2pwd
▪ Etc.	

- **FileWatcherBufferSize**

- Default: 8192
- The size, in bytes, of the internal buffer used by the watchers of each of the configured watch directories.
- This buffer is used to store information about the files involved in file system events. Small buffers may overflow causing file events to be missed by the system. Large buffers will use up large amounts of non-paged memory space which could cause system performance degradation or system errors.
- This value can be between 4 KB and 64 KB. On Windows systems, use a multiple of 4 KB for better performance.

- **FileWatcherEnabled**

- Default: True
- Indicates whether the local file watcher should be enabled.

- **FileWatcherEnumerationStrategy**
  - Default: ParallelSubdirectories
  - Strategy used for enumeration of files in the file watcher.
    - **Sequential** processes all watch directories sequentially on a single thread using a depth-first recursive search.
    - **ParallelWatchDirectories** processes all watch directories in parallel on their own thread using a depth-first recursive search.
    - **ParallelSubdirectories** processes each directory on its own thread, including subdirectories.
    - **None** disables file enumeration.
- **FileWatcherInternalThreadCount**
  - Default: 0
  - The number of threads used internally to the file processor.
  - Values less than zero indicate that the file processor should use as many threads as there are logical processors in the system.
- **FileWatcherMaxFragmentation**
  - Default: 10
  - The maximum amount of fragmentation allowed before compacting the list of processed files in the file watcher.
  - The amount of fragmentation is measured as the number of files that have been removed from the watch directory since the start of the program or the last compact operation.
- **FileWatcherOrderedEnumeration**
  - Default: False
  - Indicates whether the file watcher should raise events for enumerated files in alphabetical order.
- **FolderExclusion**
  - Semicolon-separated list of wildcard patterns used to match folder paths during file enumeration. Folders that match one of the patterns in the list will be excluded from the recursive search.
  - Patterns are case-insensitive, treat forward slash and backslash equally, and provide the following wildcard definitions:
    - **\*\*\** or **\*\*/** matches zero or more consecutive folders
    - **\*** matches one or more characters that would be valid in a file or folder name
    - **?** matches a single character that would be valid in a file or folder name



- **Historian.InstanceName**
  - Default: XDA
  - The instance name of the historian instance to be used for archiving trending data.
- **Historian.Server**
  - Default: 127.0.0.1
  - The hostname and port of the openHistorian 2.0 server to be used for archiving trending data. (e.g. 127.0.0.1:38402).
- **Historian.URL**
  - Default: http://127.0.0.1:8180
  - The URL of the openHistorian 2.0 web management tool.
- **InterruptionThreshold**
  - Default: 0.1
  - The per-unit voltage that represents the threshold between a sag and an interruption.
- **LengthUnits**
  - Default: miles
  - The units of measure to use for lengths.
  - This value is only applied to human-readable exports and does not affect the fault calculations.
- **MaxCurrent**
  - Default: 1000000.0
  - The threshold, in amps, at which the current exceeds engineering reasonableness.
  - Events with data that exceeds engineering reasonableness will be excluded from fault analysis.
- **MaxEventDuration**
  - Default: 0.0
  - The maximum duration, in seconds, of the events processed by openXDA. Events with a larger duration will not be loaded into the openXDA database.
  - The default value, 0.0, disables this setting so that openXDA processes all events regardless of the duration.

- **MaxFileCreationTimeOffset**
  - Default: 0.0
  - The maximum number of hours prior to the current system time before the file creation time indicates that the data should not be processed.
  - Use this setting when the file creation time closely coincides with the time of the data in the file to automatically skip old files and not process them.
  - The default value, 0.0, disables this setting so that openXDA processes all files regardless of the creation time.
  
- **MaxFileDuration**
  - Default: 0.0
  - The maximum duration, in seconds, of the files processed by openXDA. Files with a larger duration will be skipped by openXDA's file processing engine.
  - The default value, 0.0, disables this setting so that openXDA processes all files regardless of the duration.
  
- **MaxFileSize**
  - Default: 20.0
  - The maximum size, in MB, of the files processed by openXDA. Larger files will be skipped by openXDA's file processing engine.
  - A value of 0.0 disables this setting so that openXDA processes all files regardless of the size.
  
- **MaxTimeOffset**
  - Default: 0.0
  - The maximum number of hours beyond the current system time before the time of the event record indicates that the data is unreasonable.
  - Events with data that is considered unreasonable will be excluded from fault analysis.
  - The default value of 0.0 disables this setting so that openXDA processes files regardless of how far in the future the timestamps are.
  
- **MaxVoltage**
  - Default: 2.0
  - The per-unit threshold at which the voltage exceeds engineering reasonableness.
  - Events with data that exceeds engineering reasonableness will be excluded from fault analysis.

- **MinTimeOffset**
  - Default: 0.0
  - The maximum number of hours prior to the current system time before the time of the record indicates that the data is unreasonable.
  - Events with data that is considered unreasonable will be excluded from fault analysis.
  - The default value of 0.0 disables this setting so that openXDA processes files regardless of how old the timestamps are.
  
- **ProcessingThreadCount**
  - Default: 0
  - The number of threads used for processing meter data concurrently.
  - Values less than zero indicate that the system should use as many threads as there are logical processors in the system.
  
- **ResultsPath**
  - Default: Results
  - Directory to which the results of fault analysis will be written.
  
- **SagThreshold**
  - Default: 0.9
  - The per-unit voltage that represents the threshold between a sag and normal conditions.
  
- **SkipOnCRCHashMatch**
  - Default: True
  - Skips files that have already been processed based on a CRC hash match. This setting effectively forces the system to skip files if another file with the exact same content has already been processed.
  
- **SwellThreshold**
  - Default: 1.1
  - The per-unit voltage that represents the threshold between a swell and normal conditions.
  
- **SystemFrequency**
  - Default: 60.0
  - The frequency, in Hz, of the electrical system being analyzed by openXDA.

- **TimeTolerance**
  - Default: 0.5
  - The maximum distance, in seconds, between a meter's clock and real time.
  - Adjust this parameter to increase or decrease the tolerance used by openXDA when aligning events that occurred at approximately the same time. The system will attempt to determine whether two events could have occurred at the same time based on their relative positions in time, taking into account this time tolerance.
  
- **WatchDirectories**
  - Default: Watch
  - Semi-colon separated list of directories where fault records can be discovered by the service.
  
- **WorkbenchTimeRangeInSeconds**
  - Default: 60
  - When selecting a timestamp in the dDWorkbench events list, this represents the maximum deviation from that timestamp within which the events list will be filtered.
  - A value of 60 indicates that the user, when selecting a timestamp, wishes to see all events within one minute of the selected timestamp.
  
- **XDATimeZone**
  - Default: Local time zone
  - The time zone identifier for the time zone used by openXDA when storing time data in the openXDA database.
  - Supplying an empty string (which is the default value for this setting) will default to the local time zone of the system on which openXDA is running.