E3 Tweak User's Manual

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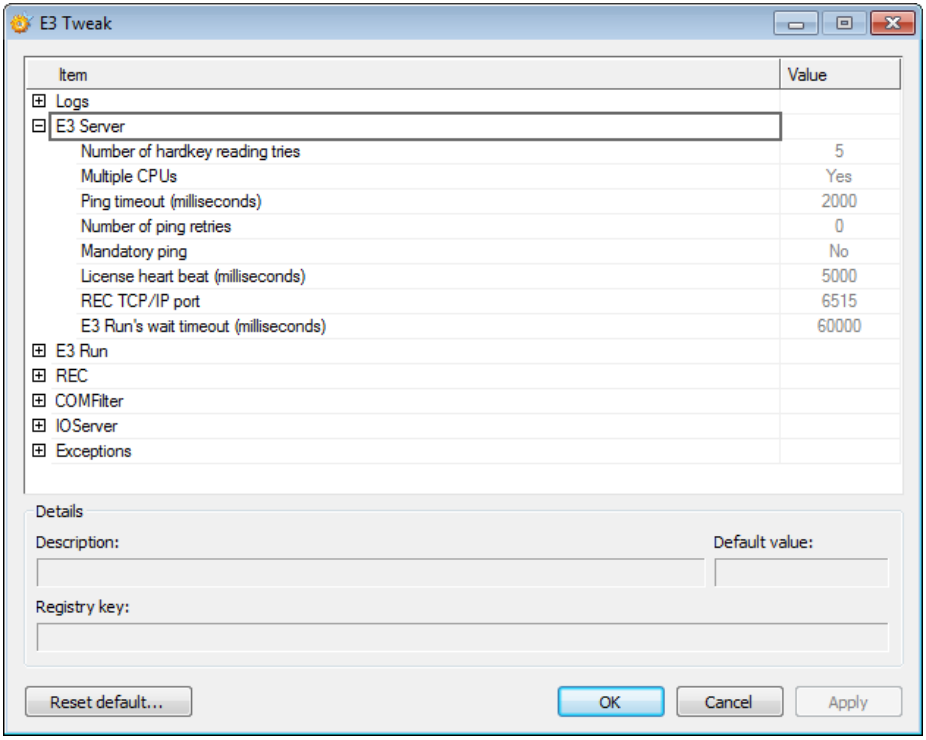
CHAPTER 1

Introduction

E3 Tweak is a tiny and simple tool for advanced E3 configurations. Its main purpose is to introduce a graphical interface for all those settings that, until now, could only be performed by using Windows Registry Editor, directly on Windows Registry.



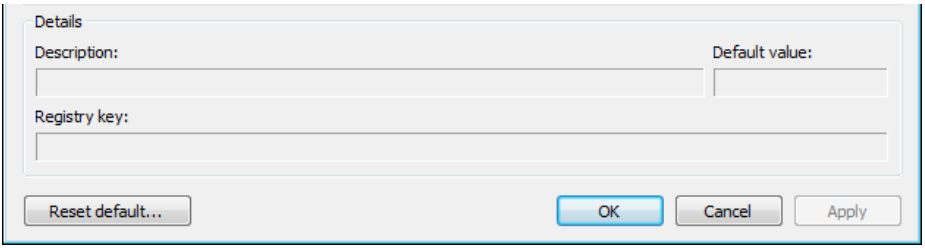
E3 Tweak's main window

CHAPTER 2

How E3 Tweak Works

E3 Tweak is presented on a window with configuration items placed on a list, with their respective values. These items are classified according to the area in which their configurations are performed: **E3 Server**, **E3Run**, **REC**, **Logs**, **COMFilter**, and **IOServer**.

Each configuration item on this list has, in its **Value** column, a Spin Button or Combo Box control. If the existent value in this control is grayed, this means that this key does not exist in Windows Registry. Selecting a new value for the item automatically creates a key in Registry. The description, default value, and Registry key of each selected configuration item are displayed at E3 Tweak window footer, as seen on the next figure.



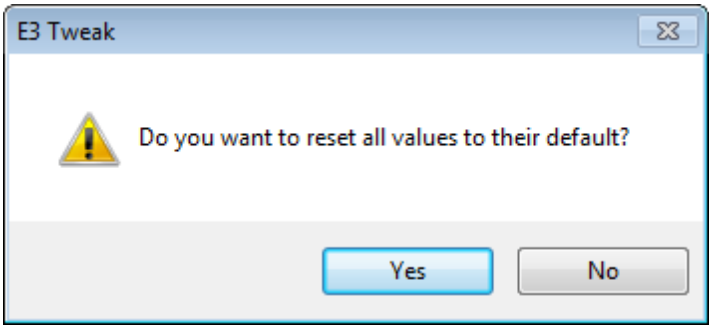
E3 Tweak's main window footer

Items whose values are numerical on **Value** column have a Spin Button control, which allows increasing or decreasing its value. On the other hand, items whose values are a **Boolean** have a Combo Box with values **Yes**, **No**, and **Default**. This last value always displays, between parentheses, the default value (**Yes** or **No**) for the selected item. In addition to directly editing values in these fields, it is possible to use the DELETE key to return to default values (in numerical and **Boolean** fields). The space bar allows toggling between **Boolean** fields (**Yes** and **No**), as well as double-clicking an item. Finally, right-clicking an item presents a contextual menu with the **Set to Default** option, which allows returning the item value to its default.

When selecting one of the configuration items on the list, the window footer automatically updates itself, by displaying the item's description, its default value, and the Registry key that must be modified or created.

On the lower part of E3 Tweak window, there are three options intended to confirm (or not) these configurations. The **Apply** option saves all changes immediately. The **OK** option saves all changes performed and closes E3 Tweak. The **Cancel** option closes E3 Tweak window, without saving the changes. In addition to these options, there is also a **Reset Default** option, which deletes all keys in Windows Registry, getting all items back to their default values. This option requires a confirmation of the operation, which can be undone by clicking **Cancel** on E3 Tweak's main window,

if needed.



Confirmation dialog for resetting to default

Each configuration item will be described on the next chapters.

NOTE: E3 Tweak is an application that needs writing privileges on Windows Registry. Because of this, the application requires higher privileges when running on operating systems Windows Vista or Windows 7.

CHAPTER 3

E3 Server Configuration

This section contains configurations for E3 Server.

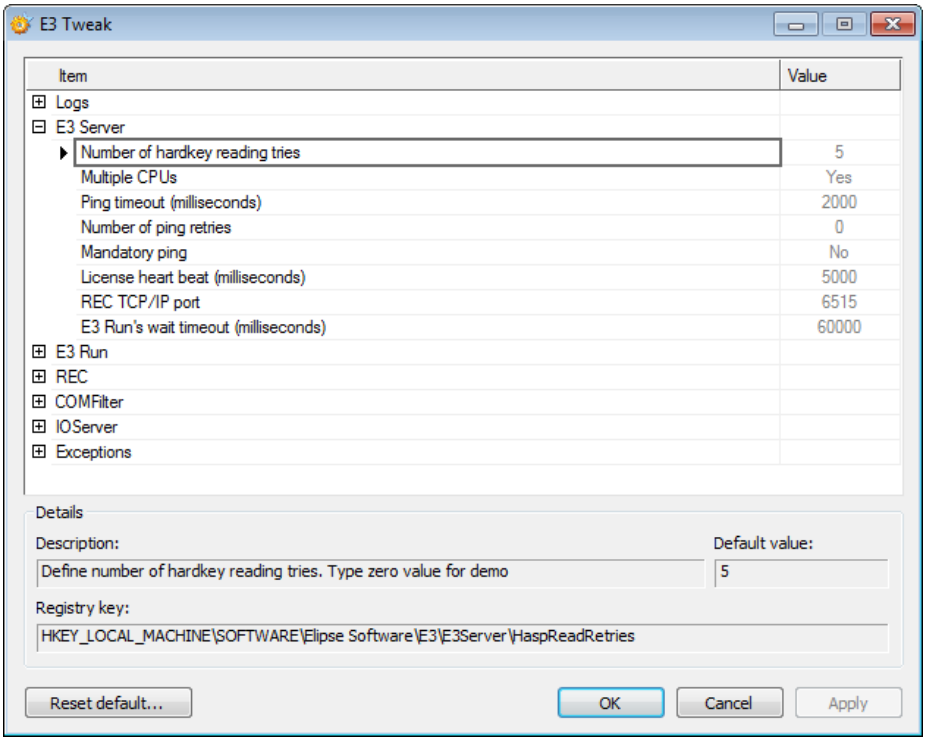
3.1 Define a Number of Hardkey Reading Tries

The E3 Server performs a certain number of protection device's reading tries; if this reading is not successful, E3 will be started in **Demo** mode. It is possible to configure the number of HASP's reading tries, performed when the E3 Server is started, using E3 Tweak's configuration item **Number of hardkey reading tries**.

If this item is not modified, the application automatically assumes a value of five. That is, five attempts to find out the protection device will be performed, with intervals of at least one second.

If this item is modified, the configured value indicates the number of HASP's reading tries performed by the E3 Server. If the configured value is 0 (zero), the **Demo** mode will be automatically enabled, whether the HASP driver or the protection device are installed or not.

During the protection device's search time, E3 Server will remain unavailable.



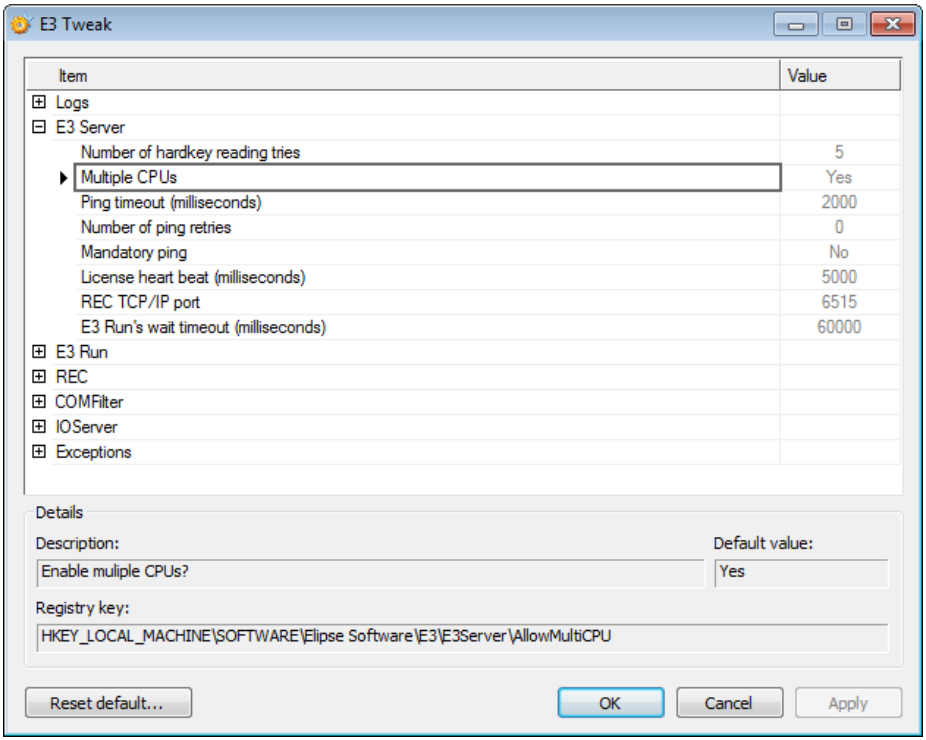
Option to define a number of protection device's reading tries

3.2 Disable Multiple CPUs

In case of biprocessed computers, it is possible to configure the E3 Server to use only the first or all available CPUs on the system, by using the E3 Tweak configuration item **Multiple CPUs**.

If this item is not modified, the system automatically assumes that the E3 Server will run on all CPUs.

If this item is modified, and the answer to the question **Enable multiple CPUs?** is **Yes**, the E3 Server is enabled to run on all available CPUs on the system. The **No** answer enables the E3 Server to run on a single CPU.



Option to disable multiple CPUs

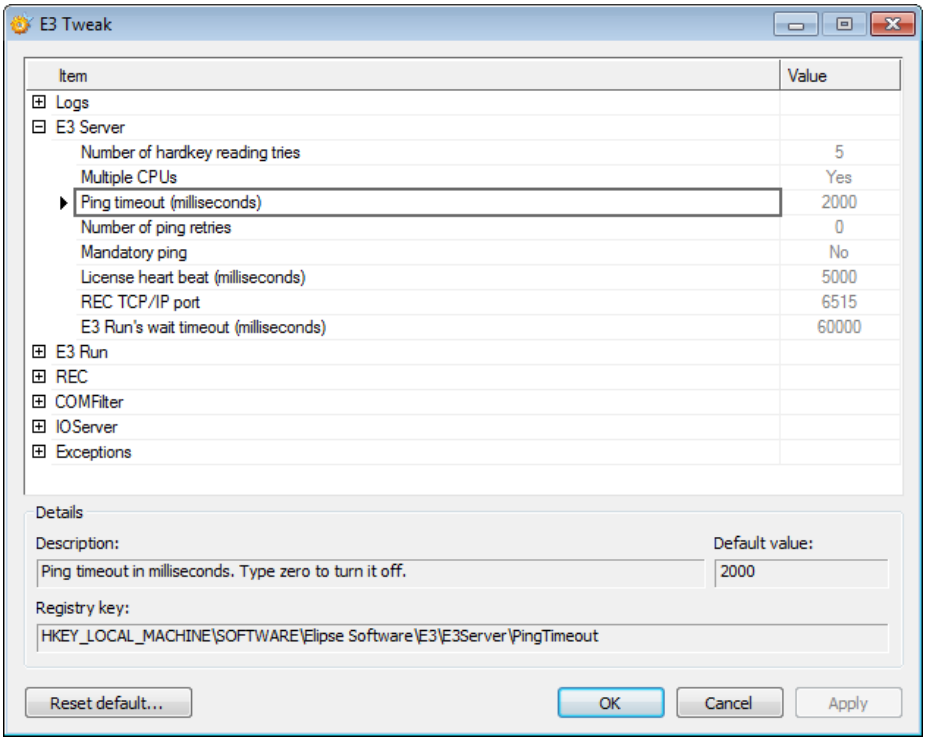
3.3 Define a Ping Timeout

It is possible to force E3 Server to quickly detect remote Viewer disconnections, interrupting data increase to be sent to the Viewer, by using the item **Ping timeout (milliseconds)**.

The value filled in this field indicates the **ping** timeout in milliseconds.

If the item is not modified, it will be used a default value of 2000ms. If the item is modified, and the variable value is configured as 0 (zero), this **ping** mechanism will be turned off.

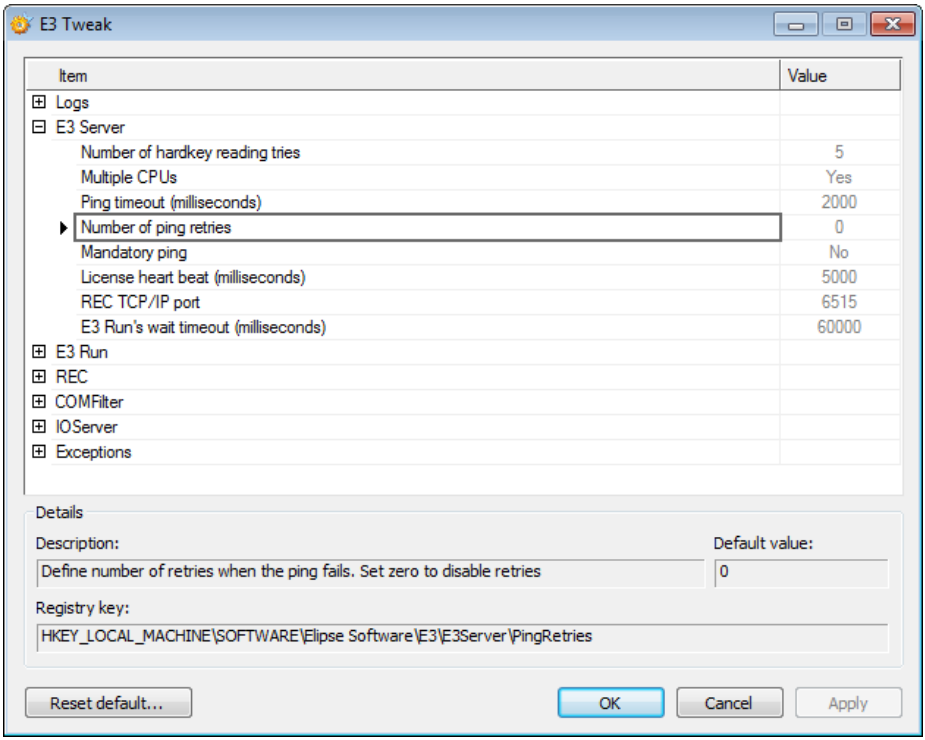
The best configuration is always use the lowest possible value allowed by the network. This enables E3 Server to detect Viewer disconnections on the minimum possible time, avoiding excessive message stacking.



Option to define a ping timeout

3.4 Define Number of Retries in Case of Ping Failure

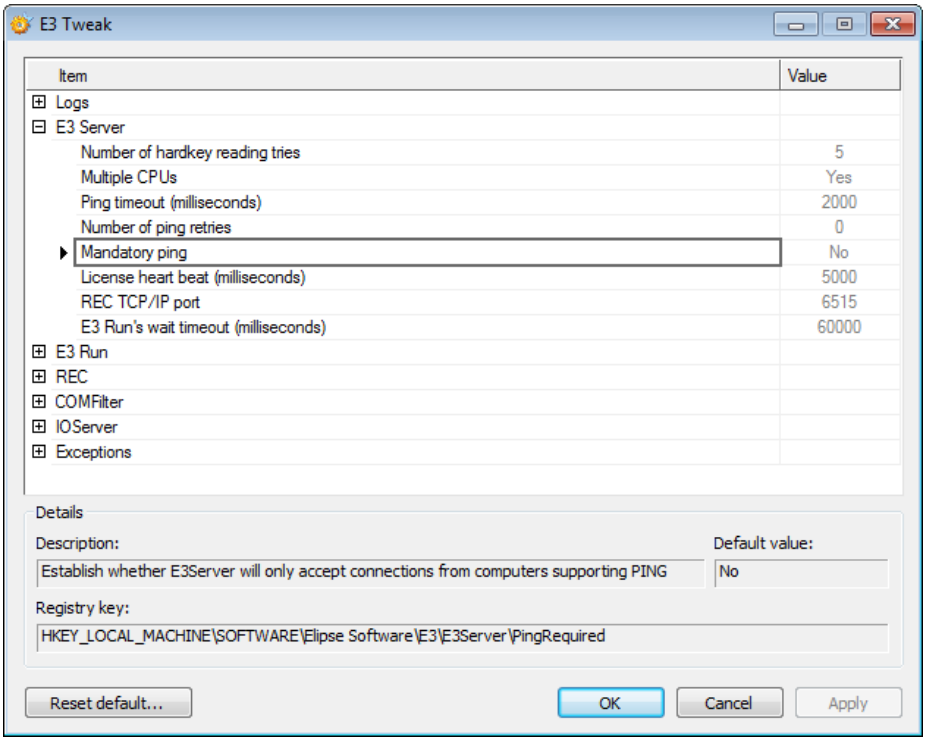
Defines the number of retries in case of failure of the **ping** command. The default value of this option is 0 (zero, no retry is executed). The allowed values for this option are in the range of 1 and 50 retries. For values above the maximum limit, the maximum allowed value is stored.



Option to define the number of ping retries

3.5 Define Mandatory Ping

Indicates whether **ping** is mandatory (value different from zero) or optional (value equal to zero or omitted). If **ping** is mandatory, the E3 Server automatically disconnects Viewers and Web Viewers not responding to the **ping** command during connection. The default value of this option is 0 (zero).



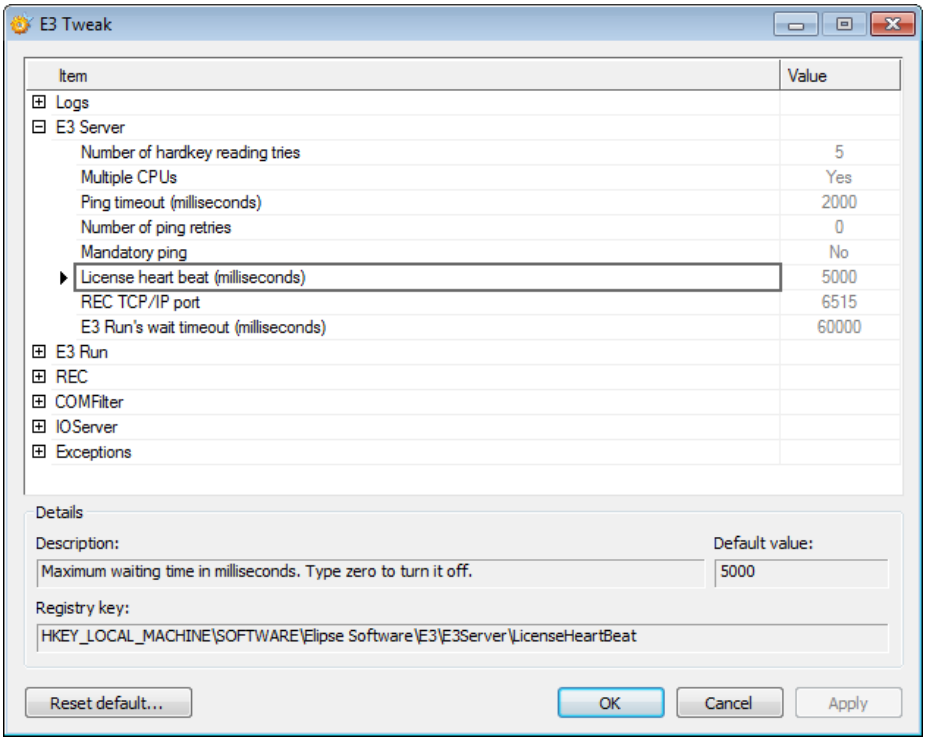
Option to define mandatory ping

3.6 Configure License Heartbeat

During license connection from server to Viewer, a keep-alive (or heartbeat) is applied by default. If the Viewer remains some time without responding, its connection is automatically closed. The heartbeat time can be configured on item **License heartbeat (milliseconds)**.

The value filled in this field indicates the heartbeat period in milliseconds.

If the value is 0 (zero), the heartbeat is turned off. If the value is not changed, then it will be considered a default time of five seconds (5000ms). The maximum time the Viewer can remain without sending the heartbeat (that is, the timeout on the server) will always be double the configured heartbeat time.



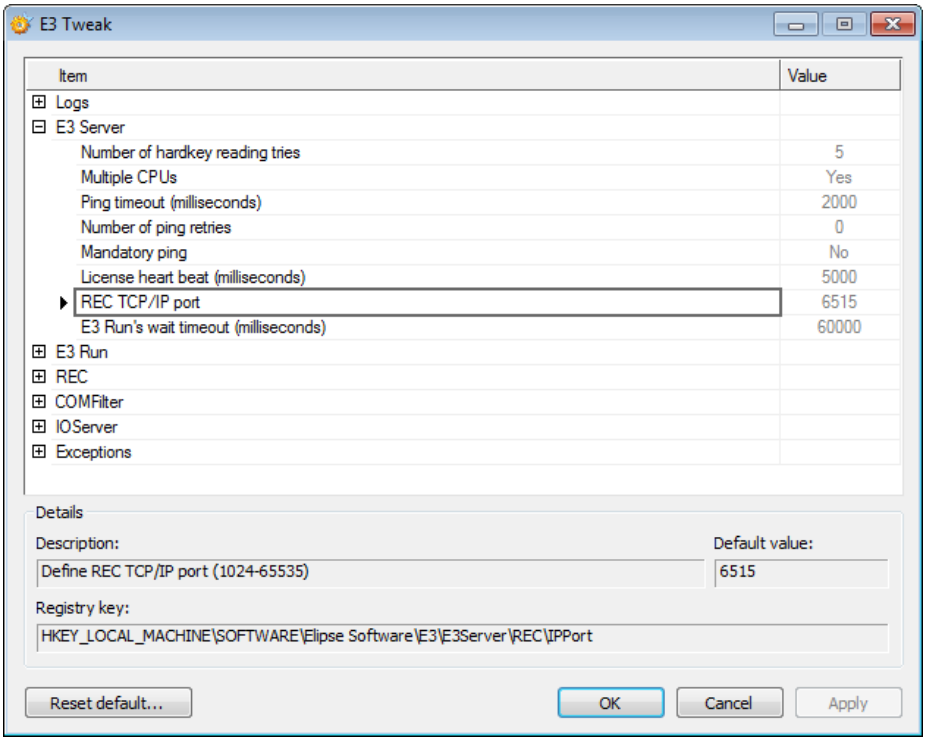
Option to configure license heartbeat

3.7 Configure REC TCP/IP Port

It is possible to configure the port number used by REC, by using the item **REC TCP/IP port**.

If this item is not modified, the system will automatically assume default port as 6515.

If this item is modified, the configured value indicates the port number used by REC protocol. Values greater than 1024 and up to 65535 can be used. Values equal to or lower than 1024 are reserved. Null or invalid values enable using port 6515.



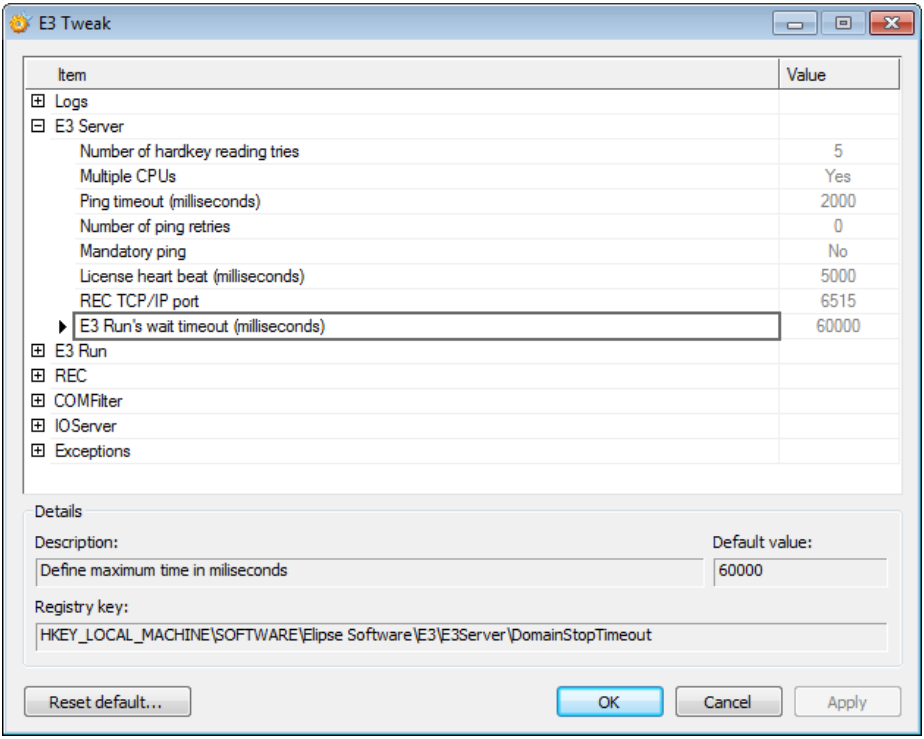
Option to configure REC TCP/IP port

3.8 Define E3Run's Wait Timeout

It is possible to specify the maximum time, in milliseconds, to quit E3Run, by using the item **E3Run's wait timeout (milliseconds)**.

If the item is not modified, the system automatically assumes a value of 60000ms (one minute).

If the item is modified, the configured value indicates the maximum time, in milliseconds, to stop E3Run. If a value equal to 0 (zero) is informed, then E3Run will be immediately stopped.



Option to define E3Run's wait timeout

CHAPTER 4

E3Run Configuration

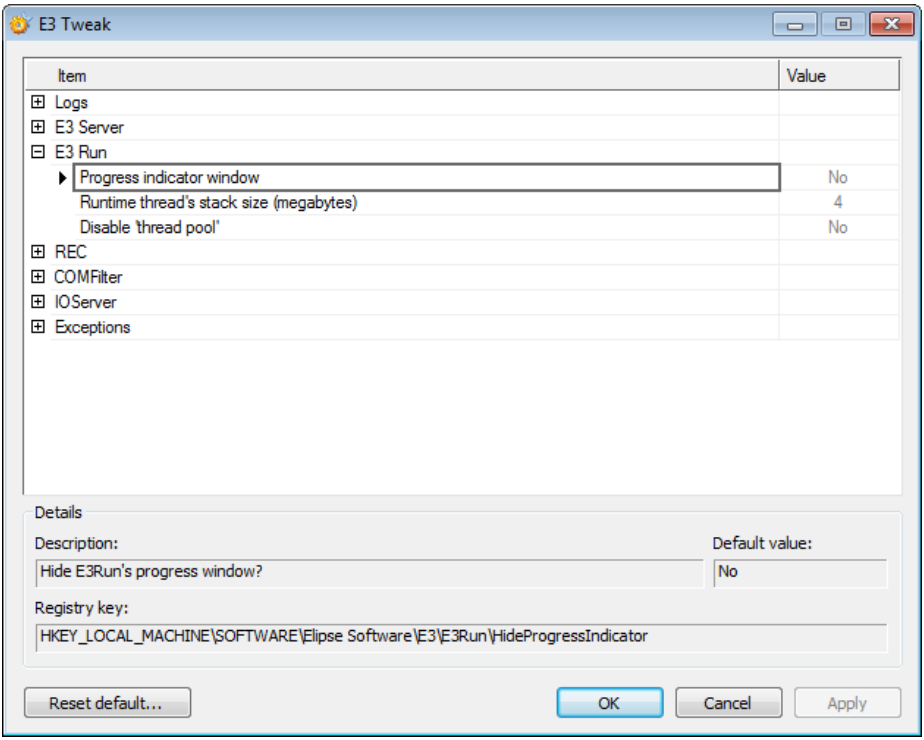
This section contains configurations for E3Run.

4.1 Hide Progress Indicator

It is possible to choose between show or hide E3Run progress window, by using the item **Progress indicator window**.

If this item is not modified, the system automatically assumes that the window must be displayed.

If this item is modified, and the answer to the question **Hide E3Run's progress window?** is **Yes**, the progress window will be hidden; if the answer is **No**, the window will be displayed.

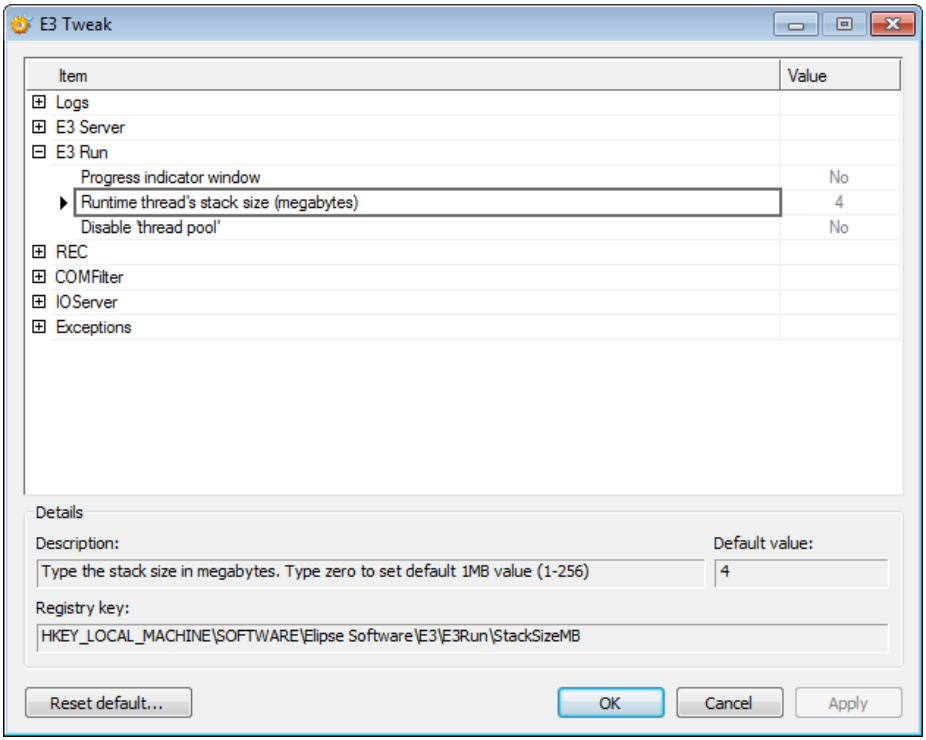


Option to hide progress indicator

4.2 Define Runtime Thread's Stack Size

The E3 Server stores function calls in a temporary structure at run time called thread stack and, as functions are being processed, they are removed from this stack. Although it is not recommended, the size of this stack can be adjusted using the item **Runtime thread's stack size (megabytes)**. The edit field should have a numerical value that specifies the size of the stack in megabytes to be used.

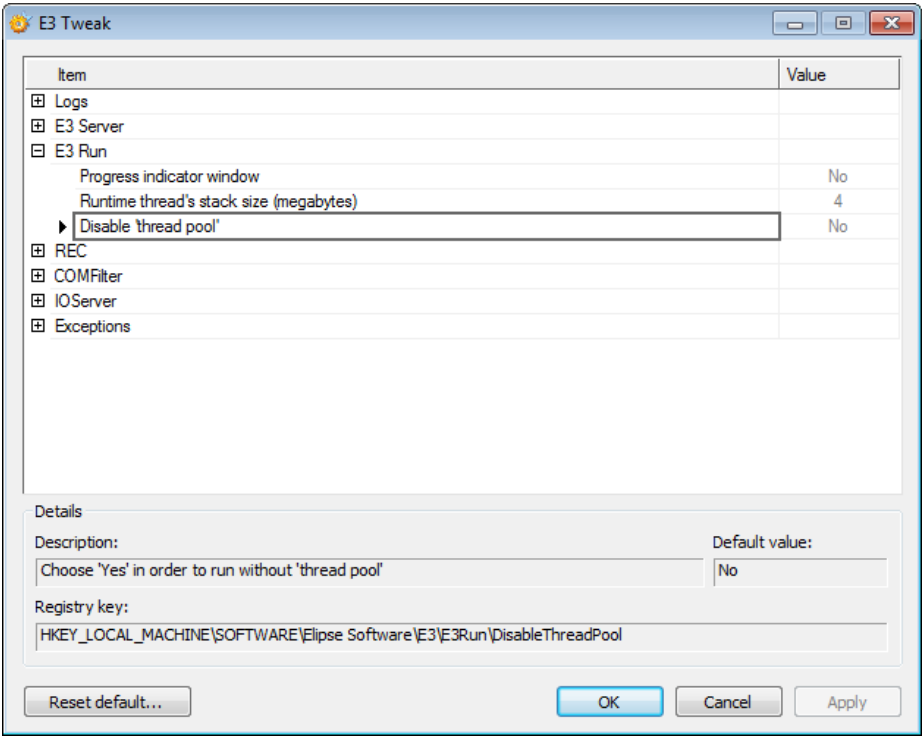
If this item is not modified, the stack value is fixed on four megabytes. In case the item is modified, a value of 0 (zero) is a special value which means that the Windows default should be used (1MB on more recent versions). Values between one and three allow reducing stack size (not recommended). Values higher than 256 will be limited to 256.



Option to define runtime thread's stack size

4.3 Disable Thread Pool

Disables the E3Run's Thread Pool feature. This option is checked by E3Run only when the process is started. E3Run must be restarted if this option changes.



Disable Thread Pool

CHAPTER 5

REC Configuration

This section contains configurations for REC protocol.

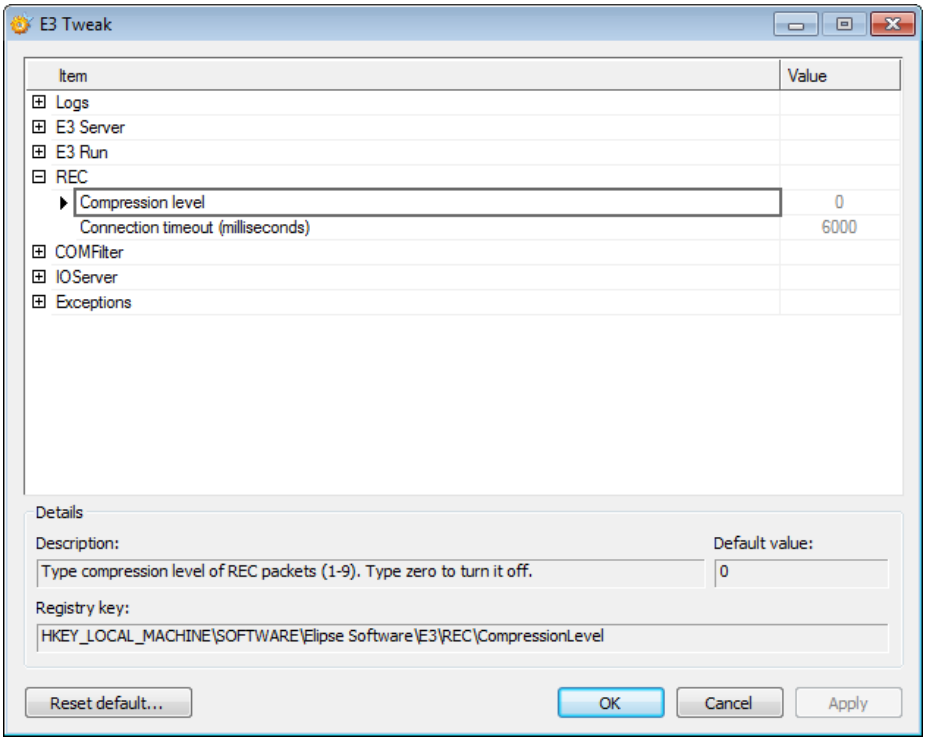
5.1 Define Compression Level

It is possible to enable communication packet compression using REC between E3 Server, Viewer, and Studio, by using the item **Compression level**.

Default value for this item is 0 (zero). If this item is not modified, the system automatically assumes that compression is disabled.

If this item is modified, any value between one and nine enables compression. The recommended value is 6 (six). Any values outside this range disable REC packet compression.

This configuration will be applied only for compression of an E3 Server or a Viewer running on a local machine. E3 Server, as well as Viewer, support packet decompression, regardless of their configurations.



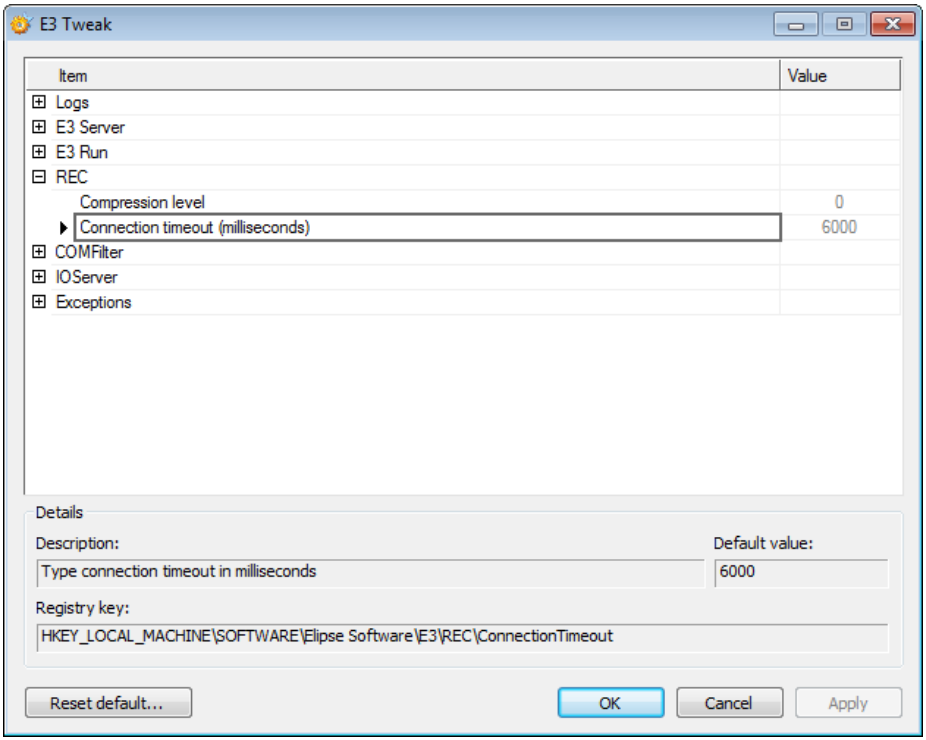
Option to define compression level

5.2 Define ConnectionTimeout

For situations when an E3 Server is starting and protection device's detection is slow, it is possible to control the maximum time that Studio or E3Admin take to connect to the E3 Server. This is done by using the item **Connection timeout (milliseconds)**.

The edit field of this item indicates the connection's maximum time, in milliseconds.

When the item is not modified, it assumes a default value of 6000ms (to allow waiting those 5000ms that E3 Server may last by default to detect the protection device).



Option to define connection timeout

NOTE: E3Admin repeatedly tries to connect to E3 Server, except when using a shortcut of type **E3Admin -option**.

CHAPTER 6

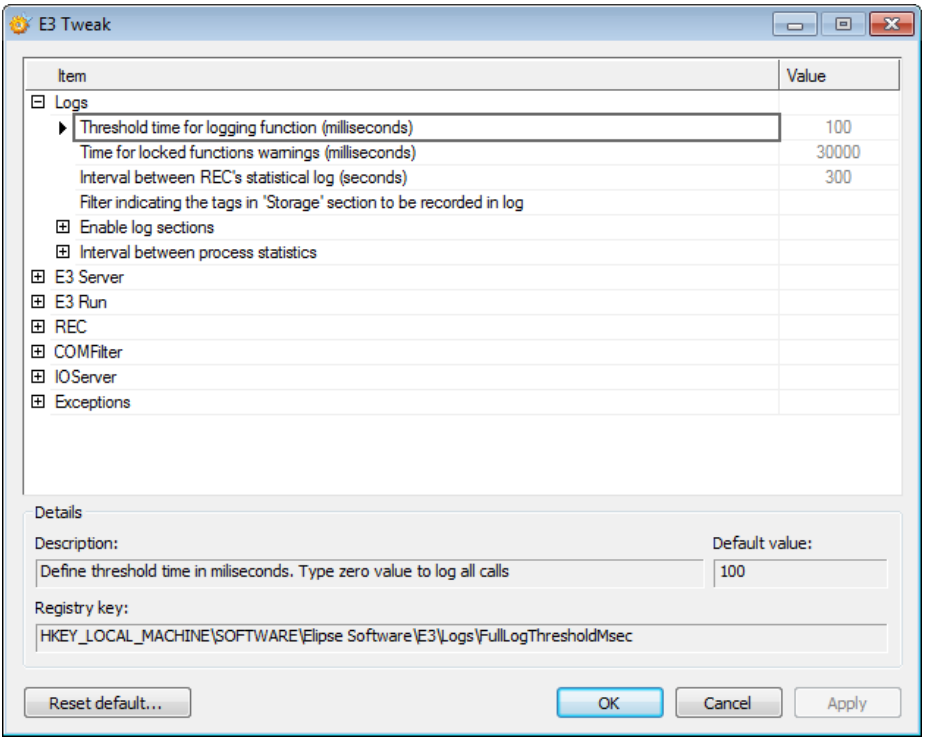
Log Configuration

This section contains configurations for E3 logs.

6.1 Define Threshold Time for Full Logging Function

It is possible to define the minimum time to log a function on **Full** logs (functions that last less than this time will not be logged). The configuration item is **Threshold time for logging function (milliseconds)**.

When this item is not modified, it assumes the default value of 100ms. Modify this item and fill in the edit field to attribute a different time value. A value of 0 (zero) forces all calls to be logged (a very low value may sensitively degrade application performance).

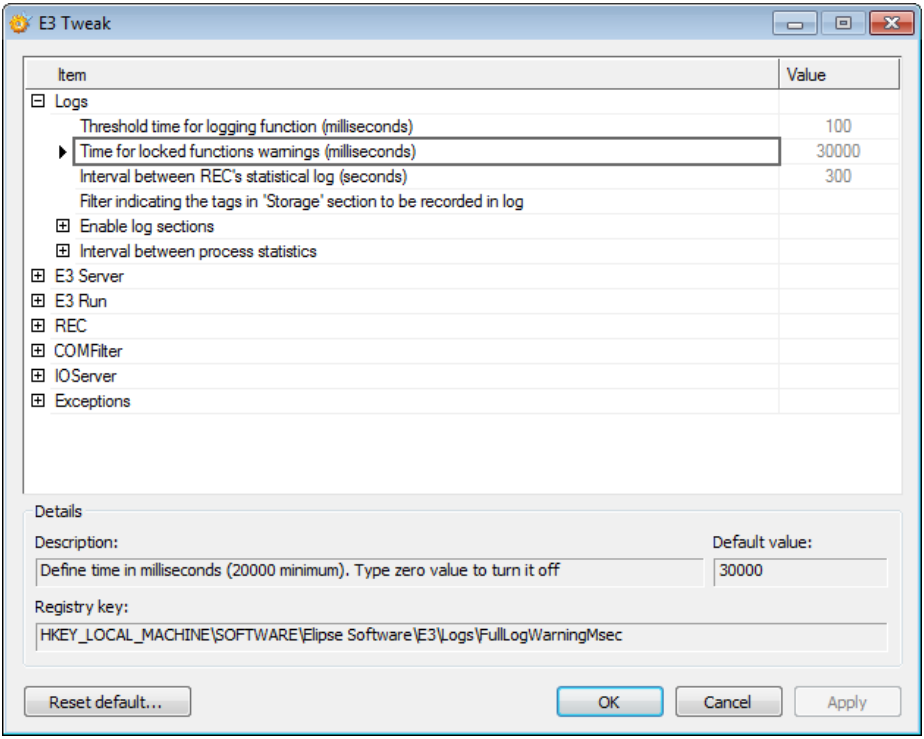


Option to define threshold time for logging function

6.2 Define Time for Locked Functions Warnings

It is possible to define the time (in milliseconds) that a function must be running so that a warning be generated (**EcoLogWarning**), informing that this function is probably locked. The configuration item is **Time for locked functions warnings (milliseconds)**.

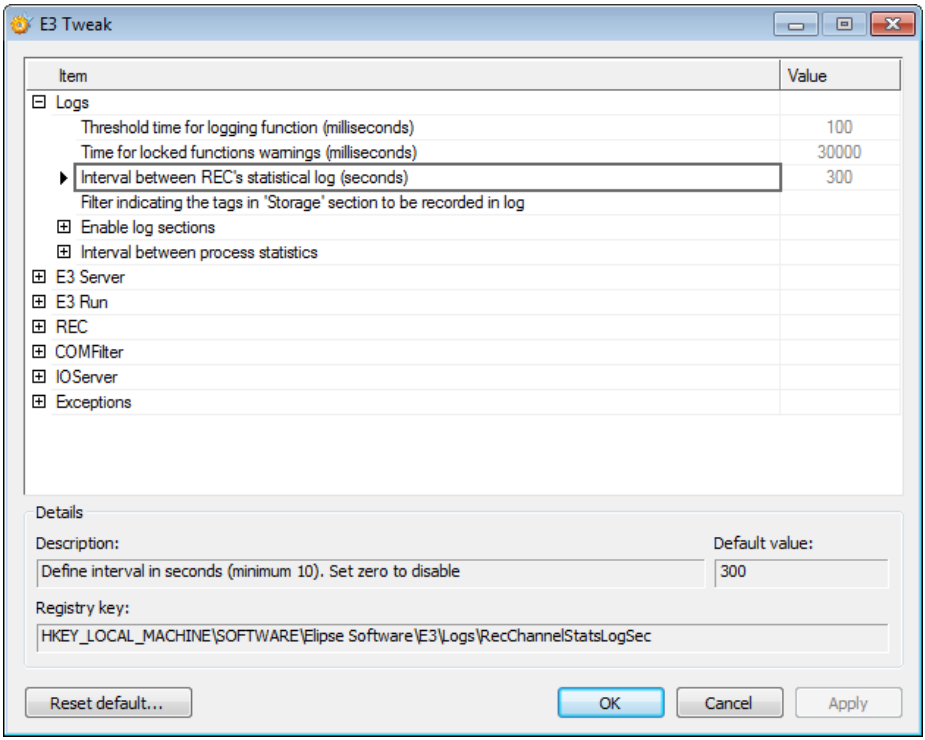
A value of 0 (zero) in this edit field disables the option. If it is not zero, the minimum acceptable value is 20000. When this item is not modified, it assumes a default value of 30000ms.



Option to define a time for locked functions warnings

6.3 Define Interval Between REC's Statistical Log

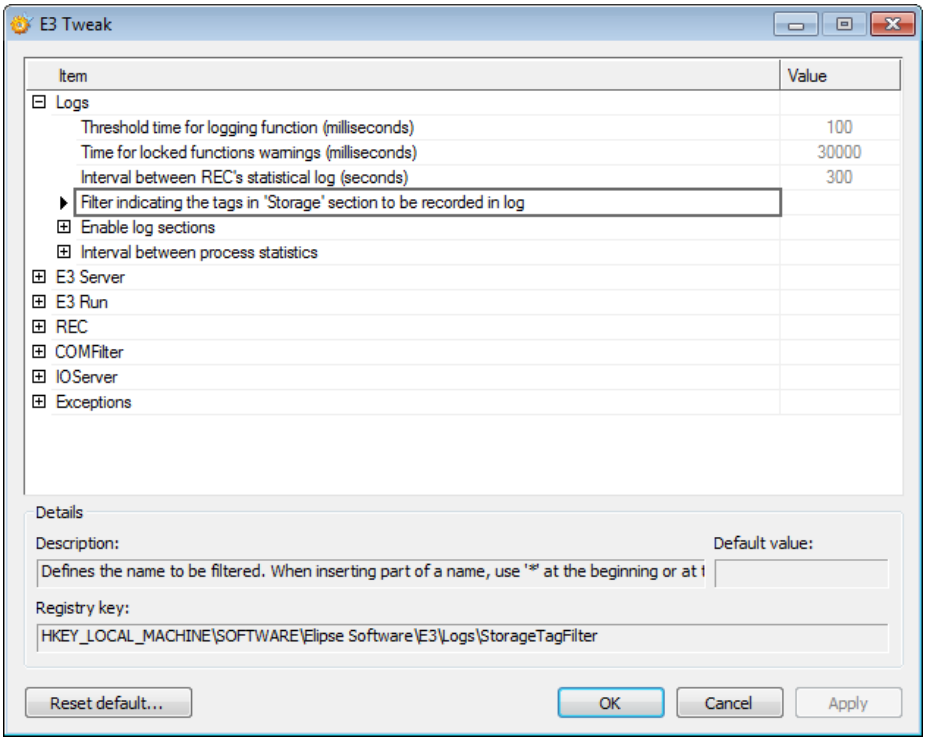
This options allows configuring the frequency, in seconds, of REC protocol statistics' log recording. The default value of this options is 300 (five minutes). A value of 0 (zero) disables periodic log generation, and the minimum accepted value is 10. In case of typing a value between one and nine in this field, E3 then uses 10s.



Option to define the interval between REC's statistical log

6.4 Add Storage Tag Filter

This section allows filtering what Tags are recorded on the log. This is a **String**-type text field, and the asterisk (*) character can be used at the beginning or at the end of the filtering text, allowing to select several Tags ending or beginning with a certain **String**. The default value of this section is an empty **String**.

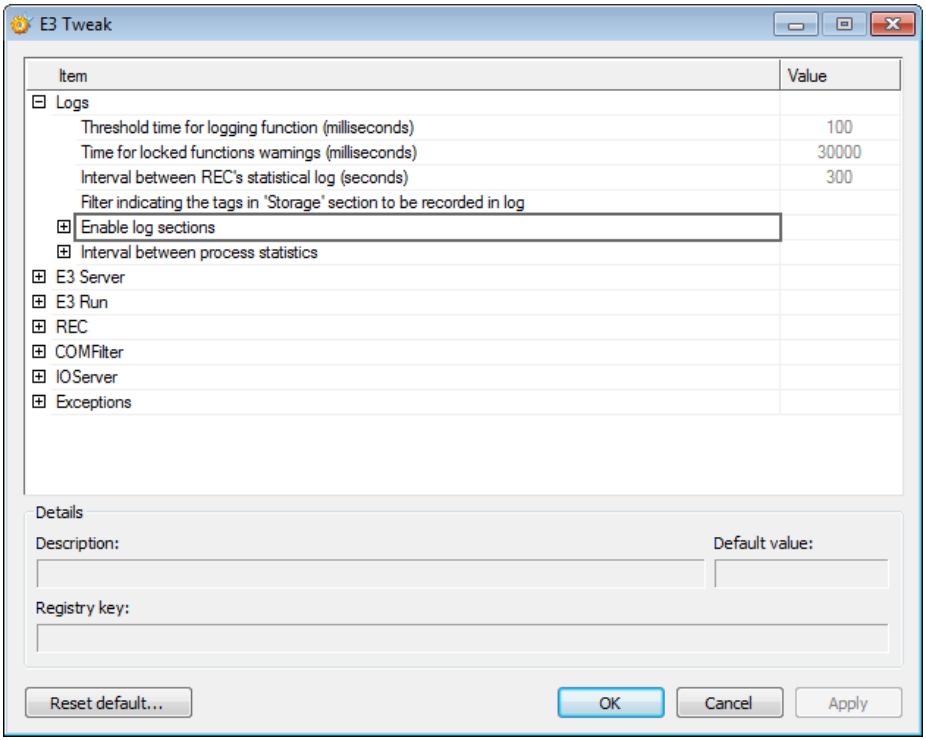


Option to add a Storage Tag filter

6.5 Enable or Disable Log Sections

It is possible to define log sections that will be enabled. Sections can be subdivided into modules, so that it is possible to enable each module separately. Each module has a configuration item with the question **Enable log section/module?**.

If items are not modified, the system automatically assumes that logs will not be created. If items are modified, a **No** answer disables log creation (except for **IOData** section, see **Notes**), and an **Yes** answer enables section log. Modifying a Section value implies in changing all Module values inside that Section.



Option to enable or disable log sections

NOTES:

- The **IOData** section is an exception to this case. Its corresponding item is **Disable IOData section**. Not changing this item is the same as enabling the section. Changing it by answering **No** to the question **Enable log section/module?** disables the section.
- Changing these variables can be performed while E3 is running, and it is applied up to 30 seconds after being executed.

The available log sections are the following:

Log sections and their modules

SECTION	DESCRIPTION
DB	Shows errors on database or data discard operations, as well as the results of operations executed on acquisition and execution threads.
ImportExport	Log generated by Studio on data importing or exporting processes.
IOData	Shows data read and written by E3Run.
Playback	Log generated by E3Playback.

SECTION	DESCRIPTION
RECRaw	Detailed log of REC communications. The available modules on this section are the following: • **Client**: records request packages • **Server**: records response packages
Storage	Allows tracking Storage operations. The available modules on this section are the following: • **Dropped**: lists all values discarded by the Storage • **Input**: lists all variations of Tag values linked to the Storage • **Stored**: displays all values sent by the Storage to a Database
Sync	Allows following information synchronized between E3 Server and E3Run (and among E3 Servers in Hot-Standby). The available modules on this section are the following: • **Alarm**: shows alarm messages generated by E3Run, which are passed to the alarm summary kept by E3 Server • **Vars**: shows changes made on E3 Server's persistent Tags database
Track	Records the life cycle of certain types of objects, from creation to destruction. The available modules on this section are process identifiers: **E3Admin**, **E3Run**, **E3Server**, **IOServer**, **Studio**, and **Viewer**.
Undo	Records system activities of Studio's **Undo** menu.

There are special log sections that record operations executed on a specific thread, as well as their duration. Only operations that last more than a certain time (default value is 100ms) are logged. These logs allow checking when E3 processing becomes slow, almost stopped. The available special log sessions are described next:

- **Full**: Main log gathering general information about E3 Server, E3Run, Studio, and Viewer execution. Available modules are described on the table below.

Available modules for Full logs

MODULE	DESCRIPTION
AlarmQueue	Threads for sending alarm events.
DomainManager	E3 Server Domain's state manager thread (opens or closes the active Domain, update a Domain after changes on .dom files).

MODULE	DESCRIPTION
E3Admin	E3Admin's main thread.
E3Runtime	E3Run's main thread, allows identifying locks or slowdowns on E3 execution.
E3Server	E3 Server's main thread.
EventQueue	E3 Server's threads responsible for sending asynchronous Link events.
LicenseManager	E3 Server's license check thread.
RemoteDomain	E3 Server's threads responsible for managing client connections from Remote Domains.
RemoteDomainsManager	Thread where management of **RemoteDomain** sets takes place.
ServerControl	E3 Server's threads responsible for managing a local or remote Domain server.
ServerControlMonitor	E3 Server's thread responsible for automatically starting E3Admin for logged in users.
ServerLinkManager	E3 Server's thread implementing Link management.
ServerSubscriptionManager	Thread managing alarm signature connections.
StandbyAlgorithm	E3 Server's thread implementing Hot-Standby algorithm decisions.
Studio	Studio's main thread (interface).
UaClient	OPC UA client's main thread.
Viewer	Viewer's main thread (interface), allows diagnosing Screen opening time, script execution time, etc.

- **FullDB**: Records operations of E3 database access' threads (generated by E3Run and E3 Server). Available modules are described on the table below.

Available modules for FullDB logs

MODULE	DESCRIPTION
DBAcquisition	Thread that sends application-generated data to queue files (.e3i).
DBExec	Thread that removes operations from queue files (.e3o) and executes commands on the database.
OCIThread	OCI's (*Oracle Call Interface*) thread.

- **FullIO**: Records activities on IOServer's threads. Available modules are described on the table below.

Available modules for FullIO logs

MODULE	DESCRIPTION
CallBack	Thread for sending data collected by a driver to E3Run.
Driver	Thread running a driver.
IOServer	IOServer's main thread, which receives driver configuration and requests sent by E3Run.

- **FullPower**: Records activities on E3PowerEngine's threads. Available modules are described on the table below.

Available modules for FullPower logs

MODULE	DESCRIPTION
LoadShedding	Module responsible for Load Shedding Electric Study calculations.
PowerEngine	Elipse Power's main module, responsible for handling E3 requests.
PowerFlow	Module responsible for Power Flow Electric Study calculations.
Send	Module responsible for sending results generated by several Electric Studies to E3.
TopologyProcessor	Module responsible for Topology Processor Electric Study calculations.

- **FullREC**: Records operations executed on REC-managed threads. Available modules are described on the table below.

Available modules for FullREC logs

MODULE	DESCRIPTION
RECServer	Server thread for a REC connection(on E3 Server).

- **PowerEngine**: Records activities on PowerEngine's threads. Available modules are described on the table below.

Available modules for PowerEngine logs

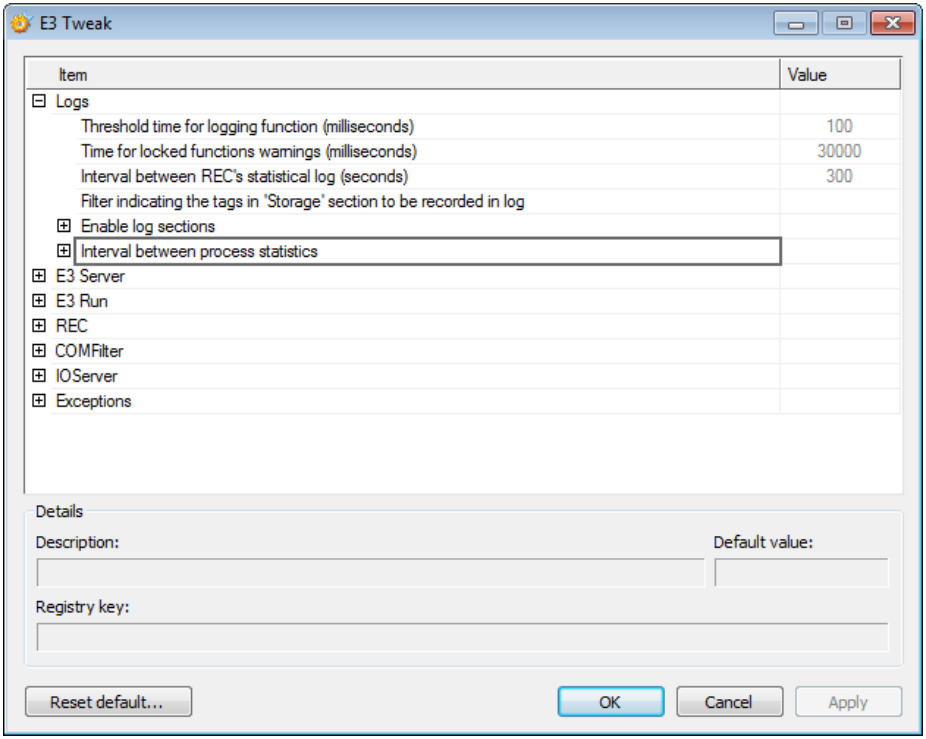
MODULE	DESCRIPTION
Input	Thread with input information for Measurements and Measurement Sources.

MODULE	DESCRIPTION
LoadShed	Thread with information about the Load Shedding module.
Output	Thread with output information for Measurements and Measurement Sources.
PowerEngine	Thread with global information about PowerEngine.

NOTE: Module configuration only has precedence over section configuration.

6.6 Interval Between Process Statistics

This section allows configuring time options for recording process statistics. The available options in this section are described on the next table.



Interval between process statistics

Options for interval between process statistics

MODULE	DESCRIPTION
E3Admin	Configures the interval between E3Admin's process statistics. The default value of this options is 60.
E3PowerEngine	Configures the interval between E3PowerEngine's process statistics. The default value of this options is 60.
E3Run	Configures the interval between E3Run's process statistics. The default value of this options is 60.
E3Server	Configures the interval between E3Server's process statistics. The default value of this options is 60.
E3UaClient	Configures the interval between E3UaClient's process statistics. The default value of this option is 60.
IOServer	Configures the interval between IOServer's process statistics. The default value of this options is 300.
Studio	Configures the interval between Studio's process statistics. The default value of this options is 60.
Viewer	Configures the interval between Viewer's process statistics. The default value of this options is 60.

NOTE: For all modules, a value of 0 (zero) disables statistical recording. Using a value between one and nine forces E3 to use a value of 10. All values are in seconds.

CHAPTER 7

COMFilter Configuration

This section contains configurations for COM filter.

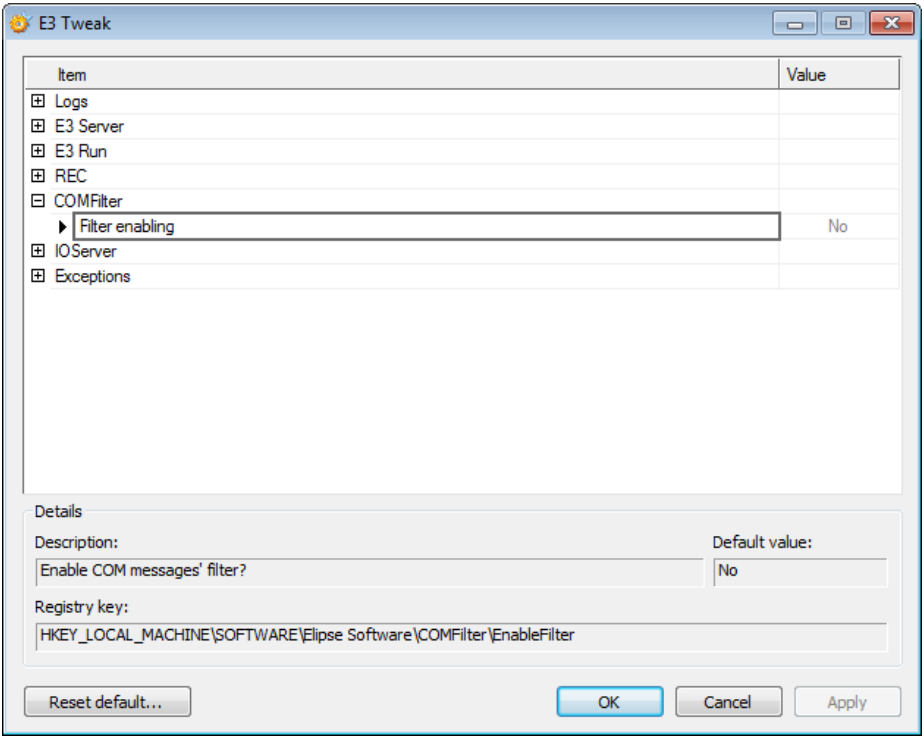
7.1 Enable Filter

E3Run implements a COM call filter aiming to avoid reentrant calls. This filter by default is disabled and to enable it (recommended only in systems that present errors or locks without an apparent cause), users can modify the item **Filter enabling**.

If this item is modified, the **Yes** answer to the question **Enable COM messages' filter?** enables the filter; a **No** answer disables the filter.

This configuration is read from the Registry only when E3Run is started. Therefore, when changing the Registry E3 must be restarted.

On E3's **Full** log it is possible to check for reentrant COM calls, for debugging purposes.



Option to enable COM messages' filter

CHAPTER 8

IOServer Configuration

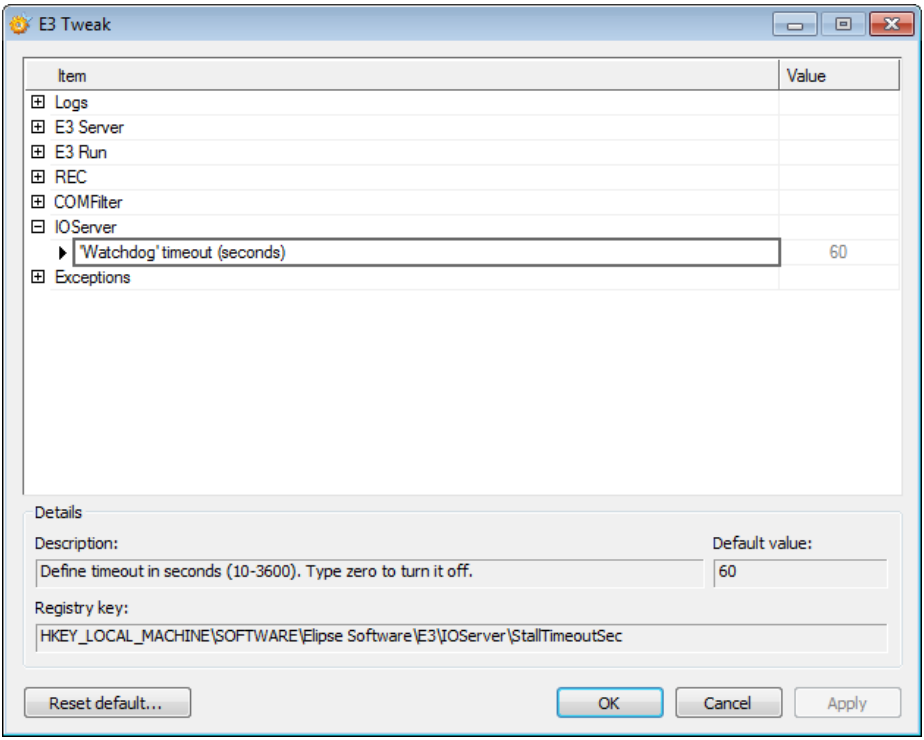
This section contains configurations for IOServer.

8.1 Type Watchdog Timeout

IOServer has a watchdog mechanism, which monitors calls performed by E3Run. If any of these calls last longer than one minute (default value), then the following actions will be taken:

- An error message is recorded on E3 log
- The IOServer process is immediately terminated, causing the DCOM call from E3Run (or from Studio) to fail, probably creating a new process for IOServer

A value of 0 (zero) in the field **'Watchdog' timeout (seconds)** disables the watchdog. Possible values for this option are in the range between 10 and 3600.



Option to type Watchdog timeout

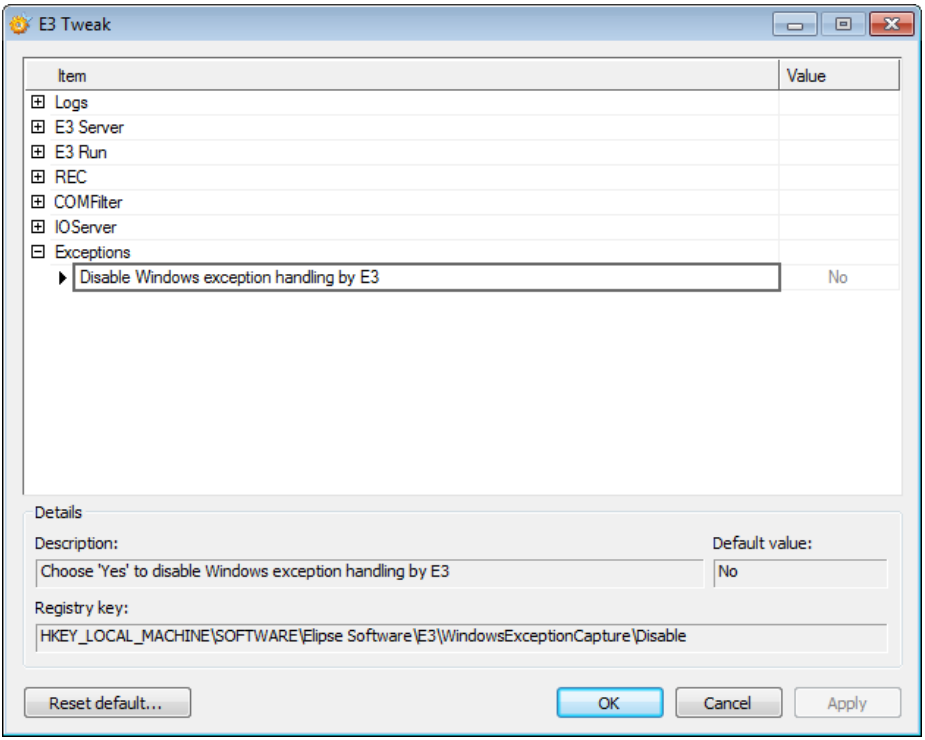
CHAPTER 9

Exception Configuration

This section contains configurations for E3 exceptions.

9.1 Disable Windows Exception Handling by E3

Disables Windows exception handling by E3. If this option is enabled (value different from zero), Windows exceptions generated at run time (E3Run) or database threads are not handled by E3, and therefore not registered in the log, and also terminate the execution of these processes. Disabling this option (default value) enables E3 to write Windows exceptions to the log.



Disable Windows exception handling

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