

The LENA Advanced Data Extractor (ADEX) User Guide Version 1.1.2

ADEXUG20110602
Copyright © 2011 LENA Foundation

The LENA Advanced Data Extractor (ADEX) User Guide Table of Contents

1. Intr	roduction to the LENA Advanced Data Extractor (ADEX)	1
2. Exp	porting Data from LENA Pro	2
	p 1: Open the LENA Pro Software	2
Ste	p 2: Select and Export ITS and LDT Data Files	2
3. Ext	racting Data from ITS Files	3
	p 1: Start the LENA Advanced Data Extractor	
Ste	p 2: Specify ITS Files Mode	4
Ste	p 3: Select and Add ITS Files to the ADEX	4
Ste	p 4: Select Files for Data Extraction	5
Ste	p 5: Select Export File Level of Detail (Output Rows)	8
Ste	p 6: Select Export File Variables (Output Columns)	11
Ste	p 7: Filter Export Data Rows by Time (Optional)	11
Ste	p 8: Specify the Output File	13
Ste	p 9: Export Data	13
	racting Data from LDT Files	
Ste	p 1: Start the LENA Advanced Data Extractor	14
Ste	p 2: Specify LDT Files Mode	14
Ste	p 3: Select and Add LDT Files to the ADEX	15
Ste	p 4: Select Files for Data Extraction	16
Ste	p 5: Select Export File Variables (Output Columns)	19
Ste	p 6: Specify the Output File	20
Ste	p 7: Export Data	20
5. Oth	ner ADEX Options and Information	21
Rer	move All Files	21
Rer	move Selected Files	21
Rel	oad Files	21
Cre	eate List of Files	22
Cre	eate List of Children	22
	eate List of Display Columns Data	
Cus	stomize ADEX Settings	23
Res	size ADEX Window	24
	lp	
Exit	t	25
	port Data Exceptions	25

1. Introduction to the LENA Advanced Data Extractor (ADEX)

The LENA Advanced Data Extractor (ADEX) is a standalone utility that provides LENA Pro users full and flexible access to data from processed audio recording files collected using the LENA DLP and exported from the LENA Pro software. In addition to audio recording data, the ADEX provides access to LENA Developmental Snapshot data that can be exported using the LENA Pro software. The ADEX exports these data directly to Excel-friendly, comma-delimited plain text (.csv) files.

The ADEX extends the scope of LENA-based research beyond the basic LENA language indices (e.g., Adult Words, Conversational Turns, Key Child Vocalizations). Using the ADEX, researchers can examine word count data separately for male and female adults and can retrieve duration data for non-key child vocalizations, overlapping speech, TV, noise, silence, and more.

The ADEX provides researchers greater control over their data. Users can pre-filter output data based on type of speech or interaction (e.g., export vocal exchanges between the key child and adult that were initiated by the child), or by time interval (e.g., export adult words spoken between 4PM and 6PM). In addition to selecting the variables of interest for export, users can specify the time resolution of the output dataset. The ADEX provides a range of selection options, from highly detailed segment-level data (i.e., individual segments less than one second to a few minutes in duration) to summary views (e.g., an entire 16-hour recording).

This document is intended as a practical guide that describes the step by step process of using the ADEX to generate output datasets. For more information on LENA Pro software please see the **LENA Pro and Research Versions User Guide**.

2. Exporting Data from LENA Pro

The LENA Pro software collects language data across two domains: audio recordings and parent reports. On export, the LENA software stores these data in one of two types of XML-formatted, plain text files. Files containing time-stamped processed audio recording segment data are identified by the file extension .its and are here referred to as ITS (Interpreted Time Segment) files. Files containing LENA Developmental Snapshot data and other information from the LENA Pro Report List are identified by the file extension .Idt and are here referred to as LDT (LENA Development Table) files. Both ITS files and LDT files can be generated from one-time exports. Users also can choose to export ITS files automatically.

Step 1: Open the LENA Pro Software

From the LENA Pro Client Manager, select a child and open LENA Reports.

Step 2: Select and Export ITS and LDT Data Files

Open the LENA Pro Export Data window by clicking on the **Export Data button** in the lower left corner of any LENA Reports screen (Figure 1).

One-time Export of ITS Files. Select the child or children of interest, choose the date range (or All Reports), click the ITS button, and specify a folder for the exported data file(s).

One-time Export of LDT Files. Select the child or children of interest, choose the date range (or All Reports), click the LDT button, and specify a folder for the exported data file(s). Note that no ITS files will be generated.

Automatic ITS File Export. To export recording session ITS files automatically each time a recording is processed, click the Automatic ITS Export checkbox, click the Choose Path button and select a data file folder.

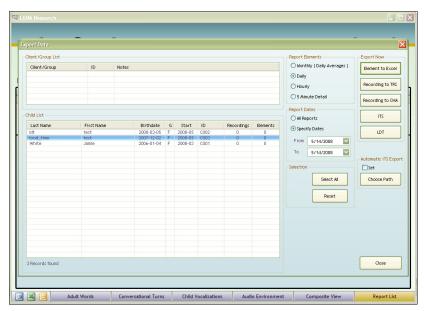


Figure 1. LENA Pro Export Data window.

3. Extracting Data from ITS Files

Audio recording data generated by the LENA Pro software are saved as XML-formatted, plain text ITS files in the folder specified at the time of the export. Once generated, ITS files are completely independent of LENA Pro and may be relocated to another folder or to another computer. The LENA Pro software need not be installed to use the Advanced Data Extractor to process ITS files. The ADEX imports these ITS files and exports the data stored within them to comma-delimited plain text files with a .csv extension (here referred to as CSV files).

Step 1: Start the LENA Advanced Data Extractor

Double-click the ADEX icon to display the main selection screen (Figure 2). The various regions of the ADEX screen are referenced here as shown in Figure 3.

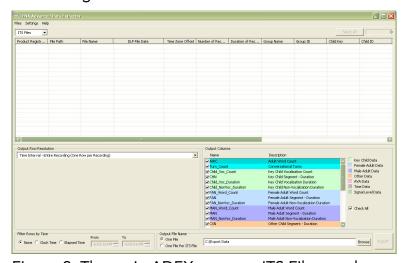


Figure 2. The main ADEX screen – ITS Files mode.

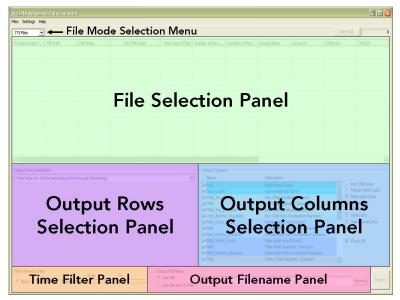


Figure 3. The main ADEX screen – panel reference.

Step 2: Specify ITS Files Mode

Select ITS Files from the File Mode Selection dropdown menu in the upper left of the ADEX screen (Figure 4).



Figure 4. File Mode Selection menu – ITS Files mode.

Step 3: Select and Add ITS Files to the ADEX

From the Files Menu, select Add (Figure 5).

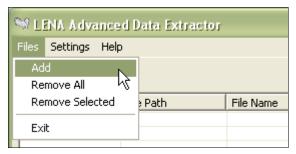


Figure 5. Files → Add menu.

This selection opens the **Add ITS Files** dialog window (Figure 6). To identify the location of the ITS files to be added, as described below either specify the path to the folder(s) containing the files, specify one or more ITS files by name, or specify a plain text file that contains a list of ITS files. Note that ITS files need not be stored in a common folder to be added to the ADEX and that the Add process may be repeated multiple times as needed during a single ADEX session.

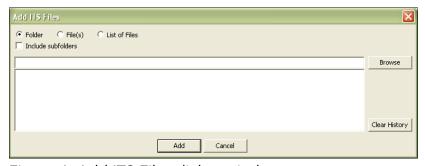


Figure 6. Add ITS Files dialog window.

Adding ITS Files from a Folder. Select Folder from the Add ITS Files dialog window (Figure 6) and either type a folder path directly into the space provided or click the Browse button to search for and select the desired folder. To import ITS files from subfolders in the same folder path, click the Include subfolders checkbox. Once the desired folder has been specified, click the Add button.

For example, assume data is collected under three different experimental conditions, and the LENA software exported files to folders C:\ITS\ExpA, C:\ITS\ExpB, and C:\ITS\ExpC. To import files from all three folders, specify C:\ITS as the import folder and click the Include subfolders checkbox.

Adding Specific ITS Files. Select File(s) from the Add ITS Files dialog window (Figure 6) and either type the full path and filename(s) directly into the space provided (separate multiple file specifications by semicolons) or click the Browse button to search for and select the desired file(s). Once the files to be added have been specified, click the Add button.

Note that in the **Browse** window multiple files can be selected via the standard Windows method: press the Shift or Ctrl key and click the left mouse button.

Adding ITS Files from a List. Use this option to identify a plain text file that contains a list of the ITS files to be added. Individual files must appear on separate lines, and the full directory pathname must be included with each file. Please see section 5. Other ADEX Options for more on creating file lists.

Select List of Files from the Add ITS Files dialog window (Figure 6) and either type the full path and name of the file directly into the space provided or click the Browse button to search for and select the desired list file. Once the desired file has been specified, click the Add button.

Clearing the Add ITS Files Search History. For convenience, the ADEX saves path information from previously specified file or folder searches. To delete this search information, click the Clear History button (Figure 6).

As files are added, the **Adding Files...** popup window (Figure 7) displays the progress status and elapsed time and provides the option to cancel the process. Note that import times vary by file length and computer system specifications.

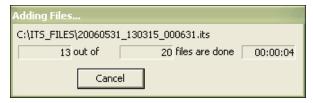


Figure 7. The Adding Files... popup progress window.

The Add process may be repeated as often as desired to add more ITS files from different locations to the ADEX selection window. Please see section **5. Other ADEX Options** for information on removing files from the ADEX selection window.

Step 4: Select Files for Data Extraction

All ITS files that have been added to the ADEX are displayed in the File Selection panel in the top half of the ADEX screen (Figure 3), one ITS file per row. **Added files are not automatically selected for data extraction.** After adding files to the ADEX, users must also specify the files to be processed. Each display column in the File Selection panel is a header variable field contained in the ITS file that may be referenced to select files. Display columns are added to exported data files.

Note that a single ITS file may contain multiple recording sessions, depending on use. (Recording sessions start and end when the REC button on the LENA DLP is pressed.) Typical use of the LENA DLP (i.e., recording one session to capacity) results in a single recording per ITS file. Regardless of the number of recordings, each ITS file is listed only once in the ADEX file selection panel. For reference, the number of recording sessions in each ITS file is included as a display column.

Any ITS file that appears in the File Selection panel may be opened for viewing by double-clicking on the row for that file. Windows Notepad is the default ITS file viewer, but any plain text file viewer may be used. Please see section **5. Other ADEX Options** for information on specifying a different default viewer.

Selecting One ITS File. To select a single ITS file for data extraction, click anywhere in the row for that file. The row appears highlighted to indicate that the file has been selected.

Selecting Multiple ITS Files. Multiple ITS files are selected in one of three ways:

Selecting all files. Click the **Select All** button in the upper right of the ADEX screen (Figure 8).

Selecting a contiguous block of files. Select the first file in the block, hold down the **Shift** key, then select the last file in the block.

Selecting noncontiguous files. Select the first file then hold down the **Ctrl** key while selecting additional files.



Figure 8. Select All files button.

Files that have been selected for data extraction appear highlighted in the file selection panel. The number of selected files is displayed in the indicator box in the upper right of the ADEX screen (Figure 8).

Customizing the File Selection Panel. The appearance of the File Selection panel may be customized. User preferences are retained between sessions.

Sorting Added Files. Click on the column header label of any display column to sort files on the values in that column. (In Figure 9 "Product Registration," "File Path," and "File Name" are column header labels.) Repeated clicking on the column header label toggles between ascending and descending sort orders.

Adjusting Display Column Width. Display columns are resizable. To adjust display column width, position the cursor to the right boundary of a column header label until the cursor changes to a double-arrow (Figure 9). Click and hold the left mouse button while dragging the mouse left or right to reduce or expand the column width.

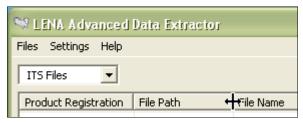


Figure 9. Adjusting Display Column width.

Adjusting File Selection Panel Height. The file selection panel is resizable. To increase or decrease the height, position the cursor below the file selection panel until the cursor changes to a vertical double-arrow (Figure 10). Click and hold the left mouse button while dragging the mouse up or down to decrease or increase the height of the file selection panel.

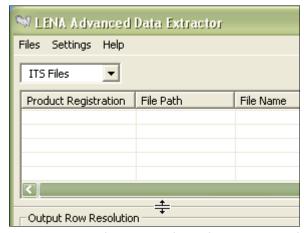


Figure 10. Adjusting File Selection panel height.

Selecting Display Columns. Users may select the columns to display in the ADEX File Selection panel (and thus to include in the export data file). Select Display/Export Columns from the Settings menu (Figure 11) to open the Select Columns to Display/Export dialog window (Figure 12).

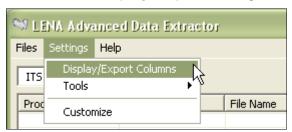


Figure 11. Settings → Display/Export Columns menu.

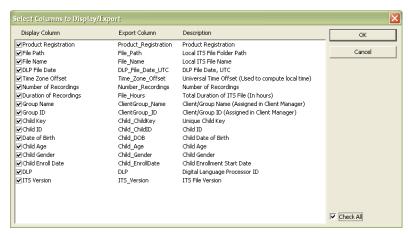


Figure 12. Select Columns to Display/Export dialog window.

Display/Export column fields may be grouped into two types:

- 1) information entered into the Client Manager or specified by the user at the time the data is exported from the LENA Pro software (e.g., group names, child IDs, dates of birth, data file locations, etc.)
- 2) information derived from the audio recording (e.g., DLP number, recording date and duration, etc.)

Both of these types of fields appear in the File Selection panel, but not all fields may be useful for all users. Display/Export columns may be selected or deselected by clicking the checkbox at the far left of each row in the **Select Columns to Display/Export** dialog window (Figure 12). Alternately, all display columns may be selected or deselected by clicking the **Check All** checkbox.

Step 5: Select Export File Level of Detail (Output Rows)

Files exported from the ADEX may be visualized as Excel spreadsheets comprising rows and columns of data. Output columns consist of identification fields such as those described in Step 4 and recording-based variables such as Adult Words. Output rows reflect the level of detail or resolution of the exported data.

ITS file recording data may be exported at three different levels of resolution:

- 1) Time Interval
- 2) Vocalization Activity Block
- 3) Segment Details

Select **Time Interval** or **Vocalization Activity Block** resolution from the Output Row Resolution dropdown menu in the Output Rows selection panel (Figure 13). The **Segment Details** level of resolution appears as an option on the **Vocalization Activity Block** dropdown menu as described below (Figure 14).

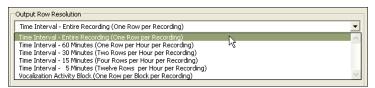


Figure 13. Output Row Resolution dropdown menu.

Output by Time Interval. Select the desired Time Interval resolution from the Output Row Resolution dropdown menu (Figure 13) in the Output Rows Selection panel. ITS file recording data exported by Time Interval may be aggregated (subtotaled) at 5, 15, 30, or 60 minute intervals, or by the Entire Recording regardless of the recording duration (the default).

For example, a 16-hour ITS file exported at 60-minute intervals would result in (16 hours)*(1 row/hour) = 16 rows in the output data file. Alternately, that same 16-hour ITS file exported at 5-minute intervals would result in (16 hours)*(12 rows/hour) = 192 rows in the output data file. Selecting **Time** Interval – Entire Recording always results in one row of data per ITS file.

Aggregated recording data are saved in the ITS file in 5-minute increments synchronized to clock time (i.e., starting on the hour, at 5 minutes after, at 10 minutes after, etc.), but recording session duration can vary. For ITS file recording data exported by Time Interval the first and/or last row of output data may be shorter than the specified time interval, depending on the starting time and duration of the recording.

Output by Vocalization Activity Block. Segment level detail data are aggregated into variable-length blocks in the ITS file based on the identified segment type (i.e., key child vocalizations, adult speech, noise, silence, etc.). There are 18 types of these Vocalization Activity Blocks, 17 of which include segments identified as human vocalizations. Pause blocks contain no human vocalization segments but may contain any other type of segment (e.g., TV, noise, silence).

Users may select any or all of these 18 block types by first selecting **Vocalization Activity Block** from the Output Row Resolution dropdown menu (Figure 13) and then choosing from among the block types displayed in the **Vocalization Activity Block** selection panel (Figure 14). To select a particular block type, click the checkbox at the far left of the row for that type. To include all available block types in the export data file, click the **Check All** checkbox.

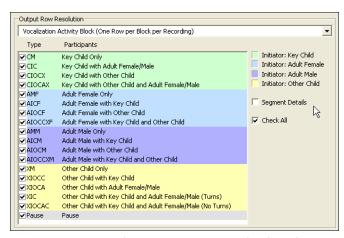


Figure 14. Vocalization Activity Block selection panel.

Vocalization Activity Block types are grouped and color-coded based on two criteria: which speaker initiated the block (Key Child, Adult Female, Adult Male, or Other Child); and what other speakers, if any, were detected. The block initiator is always listed first in the Participants column (Figure 14). For example, the Participants listing "Key Child with Adult Female/Male" indicates that the Vocalization Activity Block was initiated by the Key Child and included an adult.

The **Type** column (Figure 14) lists internal ITS file codes for each block type (CM, CIC, CIOCX, etc.). These codes can be included in the exported data file.

Note that there are two types of **Vocalization Activity Block** that include the key child, an adult, and another child (XIC & XIOCAC). The block types differ by whether or not Conversational Turns were produced in the block. When key child vocalizations and adult speech are contiguous, Conversational Turns may be produced, but when vocalizations from the other child intercede between key child and adult segments, Conversational Turns are not produced.

Output by Segment. The maximum level of resolution for ITS file data (and for the output data file) is the Segment Details level. During processing, LENA Pro software identifies up to nine types of audio segments: Key Child; Other Child; Female Adult; Male Adult; Overlapping Speech; TV; Noise; Silence; and Uncertain/Fuzzy. Segments range in duration from less than one second to several minutes, so a 16-hour ITS file may contain thousands of segments.

To output ITS file data by segment, choose Vocalization Activity Block from the Output Row Resolution dropdown menu (Figure 13), select the desired type(s) of Vocalization Activity Block (or click Check All), then click the Segment Details checkbox in the Vocalization Activity Block selection panel (Figure 14).

Step 6: Select Export File Variables (Output Columns)

As described in Step 5, files exported from the ADEX may be visualized as spreadsheets comprising rows and columns of data. Output rows reflect the level of detail or resolution of the exported data. Output columns consist of identification fields (i.e., the Display/Export Columns shown in the File Selection panel) and audio recording variables that are selected in the Output Columns selection panel in the lower right of the ADEX screen (Figure 15). This panel has two columns: the first column lists the name of each variable exactly as output to the export file, and the second column contains a brief description of each variable.

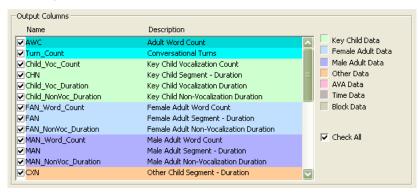


Figure 15. Output Columns selection panel.

Output columns are selected or deselected by clicking the checkbox at the far left of each row. Alternately, all output columns may be selected or deselected by clicking the **Check All** checkbox. Fields are grouped and color-coded by data type.

Output Column selections may vary somewhat depending on the selected Output Row resolution. All ITS file data variables, from Adult Word Count (AWC) through Clock_Time, are available for export regardless of the level of output resolution. Exports at the Vocalization Activity Block or Segment Details level of resolution include additional output column options specific to each level.

Note that all Display Column fields appearing in the file selection panel are output as columns in the exported data file. Columns may be selected or deselected for export via the Display/Export Columns menu (Figure 11) as described in Step 4.

Step 7: Filter Export Data Rows by Time (Optional)

The LENA digital language processor (DLP) that collects recording data includes an internal clock set to Universal Time and maintained by the processing computer's clock. Recording data written to the ITS file is time-stamped based on this clock. The ITS file also includes time zone offset information for converting between Universal Time and the local time zone of the processing computer.

Time-stamped data from an ITS file may be output in (default) Universal Time or adjusted to local time. To specify that time data be exported in local time rather than Universal Time, from the **Settings** menu select **Customize** (Figure 16) and click the **Apply Time Zone Shift** checkbox in the **Customize** window (Figure 17). Other **Customize** window choices are described in section **5. Other ADEX Options.**



Figure 16. Settings → Customize menu option.



Figure 17. Apply Time Zone Shift checkbox.

Data segments written to the ITS file are time-stamped or tagged by two types of time index: real clock time and elapsed recording time. Thus, beyond choosing the level of resolution for output data (i.e., the rows) and the variables of interest (i.e., the columns), users may opt to filter export data files further and include only rows selected on one of the two time indices as described below. By default, output data files are not filtered by time information.

Filter Rows by Clock Time. To filter the output rows of an export data file by clock time (UT or local, as described above), select Clock Time from the Filter Rows by Time panel in the lower left of the ADEX screen and specify a starting (From) and ending (To) time; for example, export only data collected between 4:00 PM and 6:00 PM (Figure 18). To stop filtering by clock time, select None.

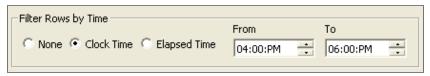


Figure 18. Filter Rows by Time panel: filter by Clock Time.

Filter Rows by Elapsed Time. To filter the output rows of the exported data file by elapsed recording time, select Elapsed Time from the Filter Rows by Time panel in the lower left corner of the ADEX screen and specify the starting time (From) and ending time (To); for example, export only data from the first four hours (Figure 19). To stop filtering by elapsed time, select None.



Figure 19. Filter Rows by Time panel: filter by Elapsed Time.

Step 8: Specify the Output File

Users can opt to export data from multiple ITS files to a single output data file (the default) or to create one export file per ITS file (useful for Segment Details). Export data files are comma-delimited plain text CSV files with the .csv extension.

Output One File. To generate one export file that contains data from all selected ITS files, select One File from the Output Filename panel in the lower right of the ADEX screen (Figure 20). The panel heading will read Output File Name. To specify a name for the export data file, either type a filename with complete folder path directly into the space provided or click the Browse button to search for a folder and select a file name.



Figure 20. Output File Name panel.

To open the export data file automatically after it is created, from the **Settings** menu select **Customize** (Figure 16) and click the **Open Output File in the Viewer after Export** checkbox in the **Customize** window (Figure 17). Other **Customize** window choices are described in section **5**. **Other ADEX Options**.

Output One File Per Recording. To generate one export data file per selected ITS file, select One File Per Recording from the Output Filename panel in the lower right of the ADEX screen (Figure 21). The panel heading will read Output Folder Path for Files. To specify a folder for export data files, either type a folder path directly into the space provided or click the Browse button to search for and select a folder. Export data files have the same root names as the original ITS files plus a .csv extension.

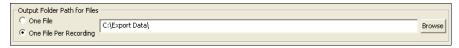


Figure 21. Output Folder Path for Files panel.

Step 9: Export Data

After selecting the ITS files from which data is to be extracted and choosing the output row resolution, the output columns, and the output file format, click the **Export** button in the lower right corner of the ADEX selection window to start the export process (Figure 22).



Figure 22. The Export button.

As data are being exported, a popup window displays the progress status and elapsed time and provides the option to cancel the process. Note that export times vary by file length and computer system specifications.

4. Extracting Data from LDT Files

LDT files generated by the LENA Pro software contain LENA Developmental Snapshot data and other information from the LENA Pro Report List and are saved as XML-formatted, plain text files in the folder specified at the time of the export. Once generated, LDT files are completely independent of LENA Pro and may be relocated to another folder or to another computer. The LENA Pro software need not be installed to use the Advanced Data Extractor to process LDT files. The ADEX imports these LDT files and exports the data stored within them to comma-delimited plain text files with a .csv extension (here referred to as CSV files).

Step 1: Start the LENA Advanced Data Extractor

Double-click the ADEX icon to display the main selection screen (Figure 2).

Step 2: Specify LDT Files Mode

Select **LDT Files** from the File Mode Selection dropdown menu in the upper left of the ADEX screen (Figure 23).

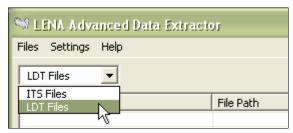


Figure 23. File Mode Selection menu – LDT Files mode.

The ADEX selection screen will change to reflect the different options available in LDT Files mode (Figure 24).

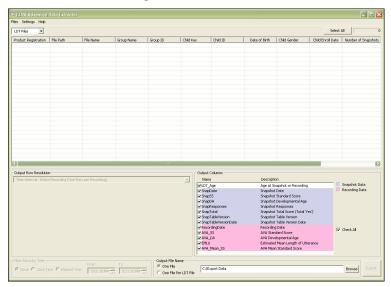


Figure 24. The main ADEX screen – LDT Files mode.

Step 3: Select and Add LDT Files to the ADEX

From the Files Menu, select Add (Figure 25).

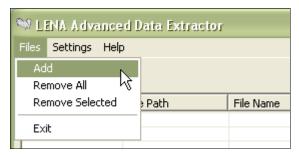


Figure 25. Files → Add menu.

This selection opens the Add LDT Files dialog window (Figure 26). To identify the location of the LDT files to be added, as described below either specify the path to the folder(s) containing the files, specify one or more LDT files by name, or specify a plain text file that contains a list of LDT files. Note that LDT files need not be stored in a common folder to be added to the ADEX and that the Add process may be repeated multiple times as needed during a single ADEX session.

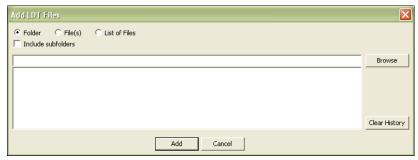


Figure 26. Add LDT Files dialog window.

Adding LDT Files from a Folder. Select Folder from the Add LDT Files dialog window (Figure 26) and either type a folder path directly into the space provided or click the Browse button to search for and select the desired folder. To import LDT files from subfolders in the same folder path, click the Include subfolders checkbox. Once the desired folder has been specified, click the Add button.

For example, assume data is collected under three different experimental conditions, and the LENA software exported files to folders C:\LDT\ExpA, C:\LDT\ExpB, and C:\LDT\ExpC. To import files from all three folders, specify C:\LDT as the import folder and click the Include subfolders checkbox.

Adding Specific LDT Files. Select File(s) from the Add LDT Files dialog window (Figure 26) and either type the full path and filename(s) directly into the space provided (separate multiple file specifications by semicolons) or click the Browse button to search for and select the desired file(s). Once the files to be added have been specified, click the Add button.

Note that in the **Browse** window multiple files can be selected via the standard Windows method: press the Shift or Ctrl key and click the left mouse button.

Adding LDT Files from a List. Use this option to identify a plain text file that contains a list of the LDT files to be added. Individual files must appear on separate lines, and the full directory pathname must be included with each file. Please see section 5. Other ADEX Options for more on creating file lists.

Select List of Files from the Add LDT Files dialog window (Figure 26) and either type the full path and filename directly into the space provided or click the **Browse** button to search for and select the desired list file. Once the desired file has been specified, click the Add button.

Clearing the Add ITS Files Search History. For convenience, the ADEX saves path information from previously specified file or folder searches. To delete this search information, click the Clear History button (Figure 26).

As files are added, the **Adding Files...** popup window (Figure 27) displays the progress status and elapsed time and provides the option to cancel the process. Note that import times vary by file length and computer system specifications.

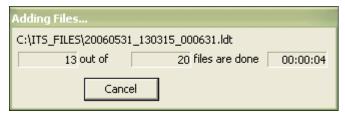


Figure 27. Adding Files... popup progress window.

The Add process may be repeated as often as desired to add more LDT files from different locations to the ADEX selection window.

Step 4: Select Files for Data Extraction

All LDT files that have been added to the ADEX are displayed in the File Selection panel in the top half of the ADEX screen (Figure 24), one LDT file per row. **Added files are not automatically selected for data extraction.** After adding files to the ADEX, users must also specify the files to be processed. Each display column in the File Selection panel is a header variable field contained in the LDT file that may be referenced to select files. Display columns are added to exported data files.

Any LDT file that appears in the File Selection panel may be opened for viewing by double-clicking on the row for that file. Windows Notepad is the default LDT file viewer, but any plain text file viewer may be used. Please see section **5. Other ADEX Options** for information on specifying a different default viewer.

Selecting One LDT File. To select a single LDT file for data extraction, click anywhere in the row for that file. The row appears highlighted to indicate that the file has been selected.

Selecting Multiple LDT Files. Multiple LDT files are selected in one of three ways:

Selecting all files. Click the **Select All** button in the upper right of the ADEX screen (Figure 28).

Selecting a contiguous block of files. Select the first file in the block, hold down the **Shift** key, then select the last file in the block.

Selecting noncontiguous files. Select the first file then hold down the **Ctrl** key while selecting additional files.



Figure 28. Select All files button.

Files that have been selected for data extraction appear highlighted in the file selection panel. The number of selected files will be displayed in the indicator box in the upper right of the ADEX screen (Figure 28).

Customizing the File Selection Panel. The appearance of the File Selection panel may be customized. User preferences are retained between sessions.

Sorting Added Files. Click on the column header label of any display column to sort files on the values in that column. (In Figure 29 "Product Registration," "File Path," and "File Name" are column header labels.) Repeated clicking on the column header label toggles between ascending and descending sort orders.

Adjusting Display Column Width. Display columns are resizable. To adjust display column width, position the cursor to the right boundary of a column header label until the cursor changes to a double-arrow (Figure 29). Click and hold the left mouse button while dragging the mouse left or right to reduce or expand the column width.



Figure 29. Adjusting Display Column width.

Adjusting File Selection Panel Height. The file selection panel is resizable. To increase or decrease the height, position the cursor below the file selection panel until the cursor changes to a vertical double-arrow (Figure 30). Click and hold the left mouse button while dragging the mouse up or down to decrease or increase the height of the file selection panel.

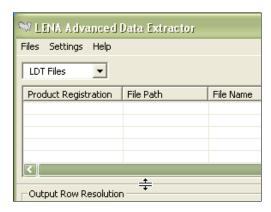


Figure 30. Adjusting File Selection panel height.

Selecting Display Columns. Users may select the columns to display in the ADEX File Selection panel (and thus to include in the export data file). Select Display/Export Columns from the Settings menu (Figure 31) to open the Select Columns to Display/Export dialog window (Figure 32).



Figure 31. Settings → Display/Export Columns menu.

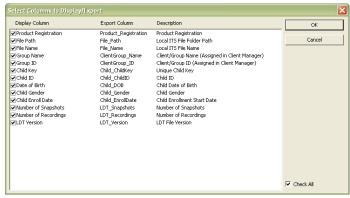


Figure 32. Select Columns to Display/Export dialog window.

Display/Export column fields may be grouped into two types:

- 1) information entered into the LENA Pro Client Manager or specified by the user at the time the data is exported from the LENA Pro software (e.g., group names, child IDs, dates of birth, data file locations, etc.)
- 2) information derived from the LENA Pro Report List table (e.g., Number of Snapshots, Number of Recordings, etc.).

Both of these types of fields appear in the File Selection panel, but not all fields may be useful for all users. Display/Export columns may be selected or deselected by clicking the checkbox at the far left of each row in the **Select Columns to Display/Export** dialog window (Figure 32). Alternately, all display columns may be selected or deselected by clicking the **Check All** checkbox.

Step 5: Select Export File Variables (Output Columns)

Files exported from the ADEX may be visualized as Excel spreadsheets comprising rows and columns of data. Output rows are similar to LENA Pro Report List rows. Output columns consist of identification fields (i.e., the Display/Export Columns shown in the File Selection panel) and LENA Pro Report List variables that are selected in the Output Columns panel in the lower right of the ADEX screen (Figure 33). This panel has two columns: the first column lists the name of each variable exactly as output to the export file, and the second column contains a brief description of the variable.

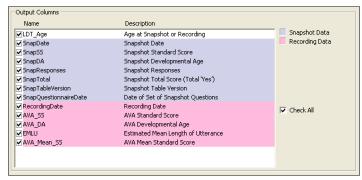


Figure 33. Output Columns selection panel.

Output columns are selected or deselected by clicking the checkbox at the far left of each row. Alternately, all output columns may be selected or deselected by clicking the **Check All** checkbox. Fields are grouped and color-coded by data type.

Note that all Display Column fields appearing in the file selection panel are output as columns in the exported data file. Columns may be selected or deselected for export via the Display/Export Columns menu (Figure 31) as described in Step 4.

Step 6: Specify the Output File

Users can opt to export data from multiple LDT files to a single output data file (the default) or to create one export file per LDT file (i.e., per child). Export data files are comma-delimited plain text CSV files with the .csv extension.

Output One File. To generate one export file that contains data for all selected LDT files, select One File from the Output Filename panel in the lower right of the ADEX screen (Figure 34). The panel heading will read Output File Name. To specify a name for the export data file, either type a filename with complete folder path directly into the space provided or click the Browse button to search for a folder and select a file name.



Figure 34. Output File Name panel.

To open the export data file automatically after it is created, from the **Settings** menu select **Customize** (Figure 16) and click the **Open Output File in the Viewer after Export** checkbox in the **Customize** window (Figure 17). Other **Customize** window choices are described in section **5**. **Other ADEX Options**.

Output One File Per Child. To generate one export data file per selected LDT file, select One File Per Child from Output Filename panel in the lower right of the ADEX screen (Figure 35). The panel heading will read Output Folder Path for Files. To specify a folder for export data files, either type a folder path directly into the space provided or click the Browse button to search for and select a folder. Export data files have the same root names as the original LDT files plus a .csv extension.



Figure 35. Output Folder Path for Files panel.

Step 7: Export Data

After selecting the LDT files from which data is to be extracted and choosing the output columns and the output file format, click the **Export** button in the lower right corner of the ADEX selection window to start the export process (Figure 36).



Figure 36. The Export button.

As data are being exported, a popup window displays the progress status and elapsed time and provides the option to cancel the process. Note that export times vary by file length and computer system specifications.

5. Other ADEX Options and Information

Remove All Files

To remove all ITS/LDT files from the ADEX, select **Remove All** from the **Files** menu (Figure 37). It is not necessary to remove current files before adding more files.

Removing files from the ADEX does not delete them from your computer.

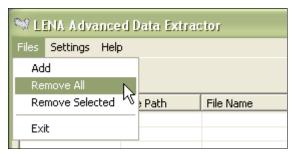


Figure 37. Files → Remove All menu option.

Remove Selected Files

To remove some ITS/LDT files from the ADEX, first select or highlight the files to be removed then select **Remove Selected** from the **Files** menu (Figure 38).

Removing files from the ADEX does not delete them from your computer.

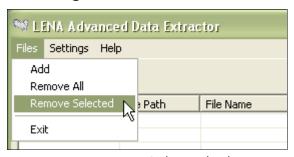


Figure 38. Remove Selected Files menu.

Files also may be removed by selecting them and then clicking the right mouse button. A **Remove File(s)** menu option will appear; click on it to remove the file(s).

Reload Files

If ITS or LDT files added to an ADEX session have been subsequently edited or reexported from LENA Pro, they may be reloaded. To reload all current ITS or LDT files, select **Reload Files** from the **Settings Tools** menu (Figure 39).



Figure 39. Reload Files menu.

Create List of Files

To generate a list of all ITS or LDT files that are currently added to the ADEX, select Tools → Create List of → Files from the Settings menu (Figure 40). In the dialog box that follows, select a folder and enter a name for the file. A plain text CSV file that contains a list of current files is generated. This file may be used to add files to the ADEX as described in the Select Files for Data Extraction sections.

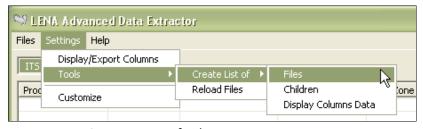


Figure 40. Create List of Files menu.

Create List of Children

To generate a file that contains LENA Pro Client Manager identification fields for each child whose ITS or LDT files are currently added to the ADEX, select **Tools** → **Create List of** → **Children** from the **Settings** menu (Figure 41). In the dialog box that follows select a folder and enter a name for the file. A plain text CSV file that contains the identification fields, one set per child, is generated.

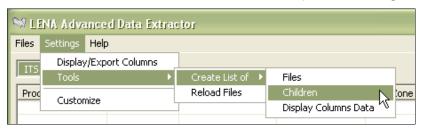


Figure 41. Create List of Children menu.

Create List of Display Columns Data

To generate a file that contains Display/Export column data for all ITS or LDT files that are currently added to the ADEX, select Tools → Create List of → Display Columns Data from the Settings menu (Figure 42). In the dialog box that follows select a folder and enter a name for the file. A plain text CSV file is generated.

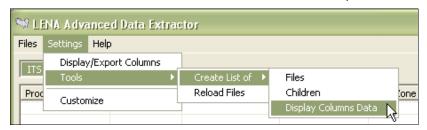


Figure 42. Create List of Display Columns Data menu.

Customize ADEX Settings

Certain ADEX features may be customized by the user. Select **Customize** from the **Settings** menu (Figure 43). The **Customize** settings dialog window displays the current options and selections (Figure 44).

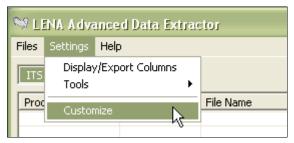


Figure 43. Customize settings menu.



Figure 44. Customize settings dialog window.

ITS/LDT File Viewer. Any ITS or LDT file that has been added to the ADEX may be viewed by double-clicking on it in the file selection panel. The software used to view plain text ITS and LDT files is listed in the **Data file viewer** box (default is Notepad). To change the viewer, either type the full path and filename of the viewer program directly into the space provided or click the ... (Browse) button to search for and select the desired viewer.

CSV File Viewer. To view an exported CSV data file automatically after it is generated, click the Open Output File in the Viewer after Export checkbox. The software used to view the plain text CSV files generated by the ADEX is listed in the Output file viewer box (the default is Notepad; when available, Excel may be a more flexible CSV viewer). To change the viewer, either type the full path and filename of the viewer program directly into the space provided or click the ... (Browse) button to search for and select the desired viewer.

Apply Time Zone Shift. The LENA digital language processor (DLP) used to collect audio recording data includes an internal clock that is set to Universal Time and maintained by the processing computer's clock. Recording data in the ITS file is time-stamped, and the ITS file also includes time zone offset information for converting between Universal Time and the local time zone of the processing computer. Time-stamped data in the ITS file may be output either in (default) Universal Time or in local time. To specify local time rather than Universal Time, click the Apply Time Zone Shift checkbox so that it appears checked.

Close Program Prompt. To prevent the user from exiting ADEX unintentionally, by default ADEX displays an Exit prompt window before closing (Figure 45). To deactivate this feature, click the **Ask before closing the program** checkbox (Figure 44) so that it appears unchecked.

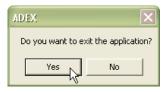


Figure 45. Exit prompt window.

Signal Level Adjustment. LENA software measures the power or energy level of individual segments in an audio recording and reports both the average RMS and peak energy level values of each segment. In the LENA software, digital signal level values are output in decibels full scale (dB FS); 0 dB FS is the maximum square wave signal level using 16-bit PCM. As a result, all dB FS values will be negative. During manufacture, to minimize inter-unit variation of each DLP, the audio sensitivity is set to record a signal of -30 dB FS in the audio file when recording a 440 Hz tone at 67 dB C-weighted SPL at the microphone. If an independent calibration of the audio environment suggests a standard offset be applied to values obtained using the LENA system, users may enter the offset to save adjusted signal level values to the export data file. To apply the offset and output adjusted average and peak energy level values, enter the desired offset value (positive or negative) where indicated in the Signal Level Adjustment text box (Figure 44). The default offset value is 0.

For example, to see the decibel level in Sound Pressure Level (SPL), enter 97 in the **Signal Level Adjustment** text box (Figure 44); this value takes into account the sensitivity of the DLP itself. The offset value will be saved so that all subsequent data exports will contain adjusted signal level values.

Resize ADEX Window

To resize ADEX, position the cursor over a side or corner of the ADEX main screen until the cursor changes to a double-arrow. Click and hold the left mouse button while dragging the mouse to increase or decrease the size of the ADEX window.

Help

To access the ADEX **User Guide** in PDF format, select the appropriate option from the **Help** menu (Figure 46). To view ADEX software version information select the **About LENA Advanced Data Extractor** option.



Figure 46. Help menu.

Exit

To exit the ADEX, select **Exit** from the **Files** menu (Figure 47).



Figure 47. Exit menu.

Export Data Exceptions

Under some circumstances, AVA-related scores that are derived from key child audio segments may fail to meet conditions required to be generated. In such cases, AVA-related output columns may show one of these non-numeric codes.

NCD: No Child Data

ORL: Out of Range Low

ICD: Insufficient Child Data

ORH: Out of Range High

NCD (No Child Data). The value NCD is shown when Conversational Turns or Key Child Vocalization Count are at zero.

ICD (Insufficient Child Data). The value ICD is shown when Conversational Turns or Key Child Vocalization Count are too low to determine AVA-related scores.

ORL/ORH (Out Of Range Low/High). The value ORL is shown when the key child is less than 2 months of age or the lower boundary for AVA-related scores is exceeded. The value ORH is shown when the key child is over 48 months of age or the upper boundary of AVA-related scores is exceeded. LENA does not generate AVA-related scores for children under 2 or over 48 months of age.