**NAHLN-O-MATIC\_AMR**

**User Guide**

This is a simple, single purpose, NAHLN message generator and sender. It uses file folders for all input and output. The only user interface is a progress box. This requires Java version 8 or higher installed and configured to execute runnable .jar archive files.

The *only* thing this program does is read Excel workbooks in the format specified by the AMR Pilot Project, convert each row in each sheet to NAHLN message format and send as a message. The only setup besides populating the source spreadsheets is in tables in the Config.xlsx file.

**What's the deal with the name?**

"NAHLN-O-MATIC" is admittedly a pretty lame name. I chose this self-deprecating moniker on purpose. The NAHLN messaging protocol is built on solid medical informatics standards to be flexible enough to message just about any results a veterinary diagnostic laboratory may produce. A serious messaging implementation has the flexibility and capacity to support that. NAHLN-O-MATIC most definitely *does not*! The original NAHLN-O-MATIC was written on a dare. I once said that if I only had to message one test, I could write the whole thing in a weekend. I was challenged on that and wrote the original NAHLN-O-MATIC over a weekend—the weekend of the AAVLD meeting at that!

I know of one lab that actually does only message one test and successfully uses their own modification of the—open source—NAHLN-O-MATIC code to do so. But for most labs this is just a sample implementation to get them started.

Because AMR does not currently follow the normal NAHLN messaging workflow of messaging every test once complete and verified, it needed a test-specific messaging tool. And so the "message only one test" limitation was perfect.

**Package contents:**

* NAHLN-O-MATIC\_AMR.jar The program.
* Config.xlsx Almost all configuration and mapping tables in Excel sheets.
* LogConfig.txt Settings for logging that must load before above can be read. Ignore.
* LICENSE.txt Apache 2.0 open source license for this code and included libraries from Apache.
* This guide NAHLN-O-MATIC\_AMR\_Guide.docx

**Folders:**

* Main NAHLN-O-MATIC folder wherever you want it.
* InBox In the main folder. Contains spreadsheets to process.
* OutBox In the main folder. Receives processed spreadsheets, messages, and acknowledgments for AA responses.
* ErrorsBox In the main folder. Receives processed spreadsheets, messages, and acknowledgments for AE and AR responses.

**Configuration:**

The Config.xslx file contains four tabs: One with configuration settings and three with mapping tables. Most of the settings in Config should be apparent. Folder locations for the three main folders can be changed but I don't know why you would. The *Host* is the NAHLN LMS service, either Test or Production. It is set to HL7ResultTest as shipped. *User* and *Password* are your NAHLN Messaging System credentials. *Mode* is D for initial debugging, T for testing with NAHLN, and P once you change over to the production server. Your *LabPIN* and *LabOID* are the same as for regular NAHLN messaging. The *NahlnOMaticOID* needs to be a branch off of your lab OID. I used .500. Since each install of NAHLN-O-MATIC keeps track of its own unique IDs, it is important that this OID be unique. *LogLevel* can be INFO or ERROR. Change to ERROR once it is working to keep your log file smaller. *ProfileID* is the filename of the current NAHLN schema without the extension. And *PollSeconds* is how often the program looks for new files in the InBox folder when run in "robot" mode. (See default mode and robot mode below).

The SNOMED tab contains all the various SNOMED code mappings used for Taxomony, Specimen Type, and Isolate Identification. The first column must match what you put in the spreadsheet ***exactly***. The exception to this is for *Salmonella enterica*. These match the Bacterial Organism Isolated and Salmonella Serotype columns combined. SNOMED is hierarchical so the organism identified names both the species and serotype. The second column is the SNOMED code and the third column is the SNOMED fully specified name.

The LOINC tab works similarly. You shouldn't need to edit this tab because the tests listed in the spreadsheet are already in here as are the panel, culture, and diagnosis codes. ***DO NOT*** modify the columns or headers in the spreadsheet in any way or the results may not map correctly. If the AMR project changes the template, we will publish an updated .jar file.

The Local tab contains the "Local" (to the NAHLN) list of Reasons for Testing. The first column must match what you put in the spreadsheet ***exactly***. If you put a slight variation, simply put that in the first column of a new row and add the code and text that correspond. If you have three people doing the spreadsheets and each words it differently, just do three rows of each. But it must match.

Note: Changes to Config.xlsx take effect the next time you start the program.

**Running:**

**Default Mode:**

When run by simply double clicking the NAHLN-O-MATIC\_AMR.jar file the program will process any data files in the InBox and then quit. A progress dialog will report on its progress. If you have more than one row filled in it may go by too fast to read. If any of the rows contain errors, a message box will report the "Unique Specimen ID" of the failed row. When complete a message box will report on the number of message accepted and the number failed.

**Robot Mode:**

This mode uses the same processing as the regular NAHLN-O-MATIC. It continuously monitors the InBox folder for new data files and processes and sends them as they arrive. It spends most of its time with the progress dialog reporting "Waiting." To start in robot mode simply add "ROBOT" to the command line to run the NAHLN-O-MATIC\_AMR.jar. The full command would be something like " C:\Program Files (x86)\Common Files\Oracle\Java\javapath\java.exe –jar NAHLN-O-MATIC\_AMR.jar robot". You would probably put this in a shortcut rather than type it each time. The program runs until you click cancel on the progress dialog. Robot mode was the default for the original NAHLN-O-MATIC.

**Handling Errors:**

Drop completed spreadsheet templates into the InBox folder. The progress dialog will report on its progress. If you have more than one row filled in it may go by too fast to read. Errors are also reported in a longer lasting message dialog. Any file that contains errors is moved to the ErrorsBox folder rather than the OutBox folder. Look in the ErrorsBox folder for any AE messages and the corresponding Spreadsheet and message files. At that point you are on your own to use Notepad++ or some other tool to read and diagnose the errors. You may want to copy the Spreadsheet and delete all but the error rows prior to correcting any errors.

**Known Bugs/Issues:**

The program has not been extensively tested on spreadsheets with some valid and some invalid messages produced. The Excel data file should end up in ErrorsBox if any row on any sheet has an error. The Ack and Message files will be in the appropriate box.

However, if an unexpected error (internal error, data corruption, malformed Excel sheet, LMS Server error or timeout, etc.) occurs, the source file moves to the ErrorsBox and it will take some doing to figure out what has been sent by looking in the OutBox.