AMS Data Acquisition (DAQ) Software

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Update on Software Status

Current Software Version: V 4.4.8

Software version that is most widely distributed right now:
AMS Version V 4.3mode

New Features in V 4.4.8:
1) Jump-MS*
2) General Alternation Mode*
3) Light Scattering

* Programmed by Jose Jimenez and briefly discussed at last Users Meeting

I recommend that you all update to V 4.4.8!
Downloading AMS DAQ Software

1) Aerodyne ftp site:
   AMSIncoming\AMSUsers\ALLUsers\AMSSoftware

2) Jose’s Web Page( http://cires.colorado.edu)
   Section 3.4. Resources for Aerodyne AMS Users
   - provides direct link to ARI ftp site

You will be prompted for the Username/Password combination that you use to access your folder on the ftp site.

(Please see Tim or Manjula if you don’t have this information)
AMS Program Requirements

1) Pre-installation of the appropriate AMS Application Setup Program

2) Pre-installation of the NIDAQ Software for slow/fast Data Acquisition Boards

   NOTE: The NIDAQ EXAMPLES FILE MUST ALSO BE INCLUDED IN INSTALLATION

   - NIDAQ installation process places files accessed by AMS program (i.e. NIDAQ32.dll and NIDEX32.dll) in C:\winnt\System32 folder.

3) The computer C drive must contain a C:\AMS\AMSCCode folder with the following files:
   a) AMSMenu.prm
   b) AMSID.prm files.
Installing Application Setup Program

• Application setup program that was installed at ARI in AMS computers was a Win 98 version that enables you to run any AMS executable made by me under a Win98 OS System.
• I compile new versions of AMS executables under a Win2000 OS so you MUST update the Application Setup Program to the Win2K Version in order to run new version of AMS program.

The Win2K Application Setup can be downloaded from the ARI FTP site in the following folder:

AMSIncoming\AMSUsers\ALLUsers\AMSSoftware\Installs\Win2KInstalls
Installing Application Setup Program

1) Uninstall Win98 Application Program
   - go to Start\Settings\ControlPanel\AddRemoveSoftware
   - Remove Program called AMS

2) Install the Win2000 Application Program
   - Shut down all other programs
   - Go to copy of Win2KInstalls folder and start the Setup.exe

**NOTE:** Ignore the message that reports a conflict with the shdocvw.dll
Software Requirements During Field Campaigns

CD’s containing the following files should be available:

1) NIDAQ Software

2) AMS Application Setup Folder from ftp site

3) AMSMenu.prm and AMSID.prm files.
New Program Buttons
Jump MS mode

- Like MS mode, but scanning only a few m/z
- Like “selected ion monitoring” (SIM) in GC-MS

Diagram:
- Scan m/z once
- Go to peak at m/z 30
- Move on to next m/z at m/z 48
S/N Improvement in Jump-MS

Flight Data Courtesy of J. Crosier (UMIST)
10 Hz Jump Mode Sensitivity

\[ F_N = w'\chi'_N = w\chi_N - w\chi_N \]

Example Time-Series Measured with AMS (Urban Emission of NO$_3^-$)

Courtesy E.Nemitz (CEH, Scotland)

Obtained with Eddy Type2 Mode programmed by Jose Jimenez
NOTES:

• In data acquisition boards menu tab the acquisition rate for JMS needs to be specified for the JMS Mode.
• Scanned m/z’s are from F6 Screen Settings. First m/z scanned provides DC level. So it should be one with no particle signal.
• Data is saved in JMS.itx (Analogous to MS.itx)
General Alternation Mode ("GENALT")

• Alternate TOF, MS, JMS
  – Or any two of them
  – Variable time for each mode

• Implemented as separate mode from old TOF-MS alternate mode

• At present (v. 4.4.8) both modes work
  – In future probably only support GENALT
Light Scattering
NOTE: BUG FIXED in which 1st m/z in TOF got bogus SP counts when switching from MS to TOF in Alternate Mode (Thanks to Eben Cross for helping debug the error!)
AMS Operating Modes

"Chase" Applications
- TOF and MS Saves with 2S Time Resolution
- Recommend max of 6 TOF masses
- Setup TOF and MS settings in regular AMS TOF/MS Modes and then turn on NYC Alternate Mode. DO NOT HIT TOO MANY KEYS IN NYC Alternate Mode- just let it run or it may crash with too much user input
- Regular TOF.itx and MS.itx saved in AutoSave Directory

* Plume Mode
AMS Software problems

1) Check Menu (especially if problem is sudden)
   – Gets corrupted if program crashes or is exited in non-standard way
   – At least 50% of problems are due to this
   – C:\AMS\AMSCode\AMSMenu.prm
   – A copy is saved on AMSLogFiles directory
     (C:\AMS\AMSData\AMSLogFiles) every day you use the program (i.e. 041011_Menu.prm for today’s menu)
   – Also saved in every ITX file (“par” and “ParStr”)
   – Compare you current menu with a known good one side-by-side in Excel
   – Make backups of known good menus
Syncing AMS with Other Operations

1) Save AMS Data Based on Externally Input Digital Signal

2) Output Digital Signal
When AMS Program Saves- Use this signal to sync other instruments, processes (i.e. wire probe movement) with AMS

- This option has been successfully implemented in previous version for UMIST, but needs to be included in the AMSV4.4.8
Syncing AMS with Other Operations

- Use separate program that has the same save timing as AMS (i.e. Synced Valve operation in Prophet, Duke Forest, Nova Scotia)
- Ask Manjula if you want this program
Syncing AMS with Other Operations

Use the Extra Analog Inputs on Slow Board
AMS Software problems

2) Runtime Error # 6
   - Typically occurs in TOF mode only not in MS mode. It is often because of a drop out of the chopper signal.
   - Chopper signal can drop out if bad signal coming from diode or chopper wheel is not spinning when chopper servo moves through the block/chop/open cycles.
   - Software crash due to this error will be prevented in future software versions.

3) Check TOF velocity calibration. This can cause “division by zero” issues.

Most Current Software problems due to either menu corruption or Chopper signal issues!
Troubleshooting Software Problems

Information Needed:

1) Software version
2) Exact error message
3) Operating mode (Alternating, TOF Mode only, LS On…)
4) What mode the error occurs in (TOF/MS /JMS)
5) Any keystrokes that may have caused error
6) AMSMenu.prm
My 2 New bosses...