

# PicoPak Software Overview

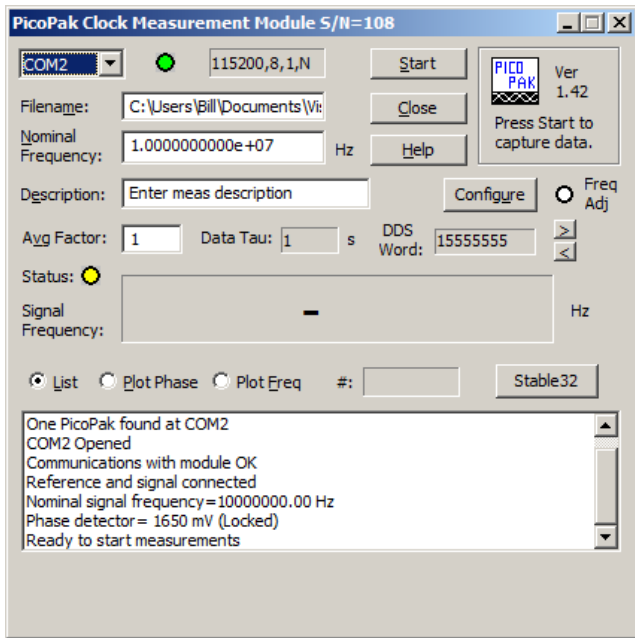
W.J. Riley  
Hamilton Technical Services  
Beaufort, SC 29907 USA  
bill@wriley.com

- **Introduction**

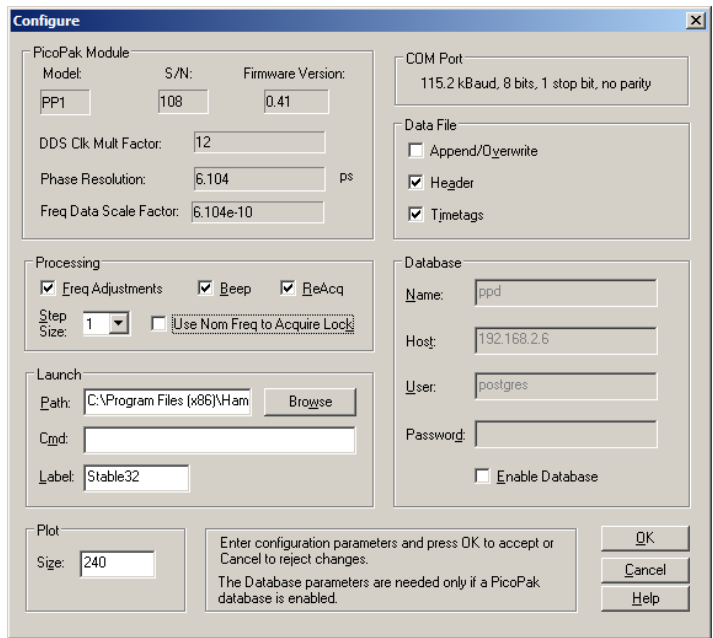
The PicoPak clock measurement module package includes several software applications that support its use. This document briefly describes those programs.

- **PicoPak**

The PicoPak program (PicoPak.exe) supports the operation of PicoPak clock measurement modules. The PicoPak main and configure screens are shown below:



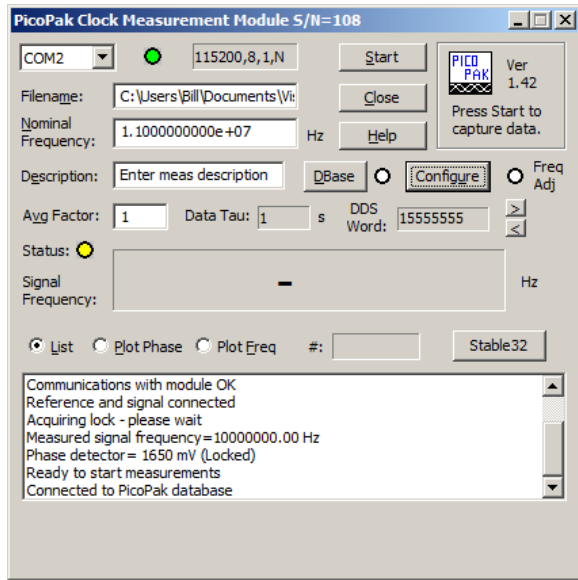
PicoPak Main Screen at Startup



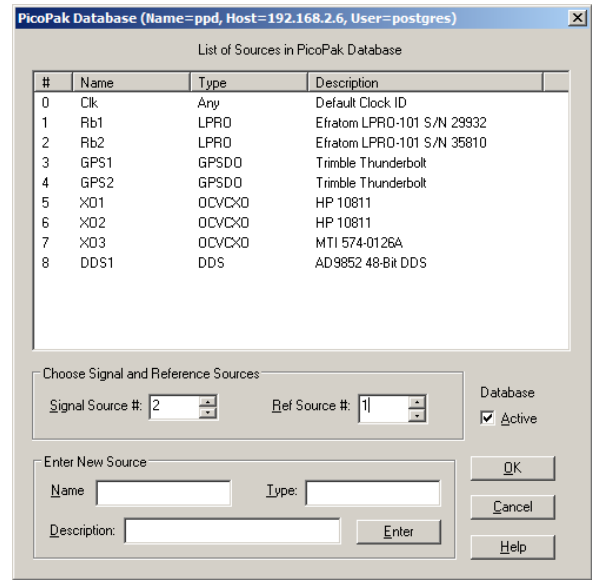
PicoPak Configure Screen with Typical Settings

- **PicoSQL**

The PicoSQL program (PicoSQL.exe) supports accessing clock data from an optional PicoPak PostgreSQL database. When the database is enabled, the PicoPak program main screen includes a DBase button that opens a database screen as shown below:

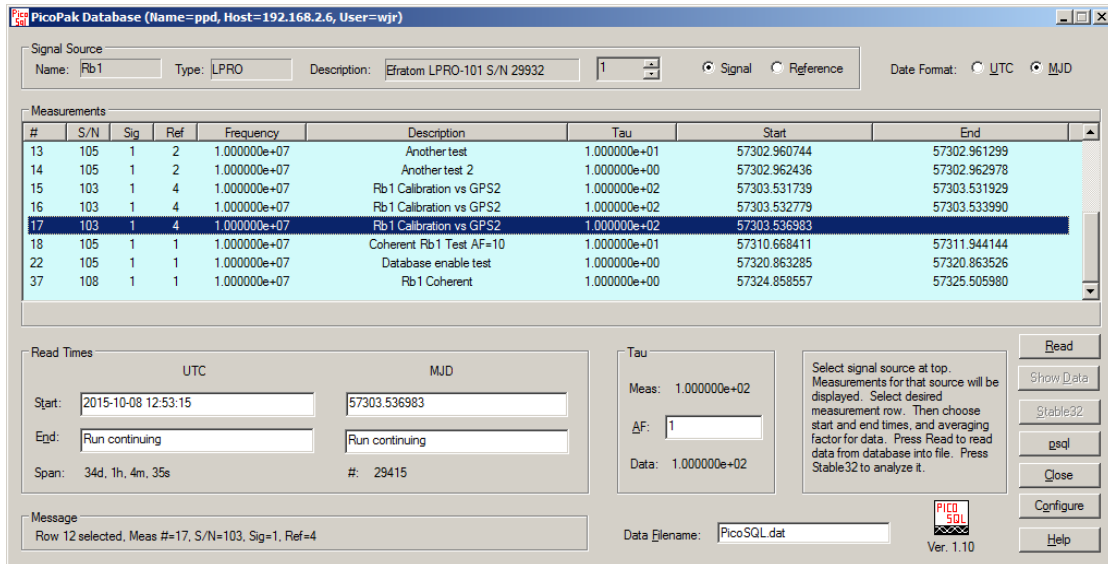


PicoPak Main Screen with Database Enabled



PicoPak Database Screen with Typical Settings

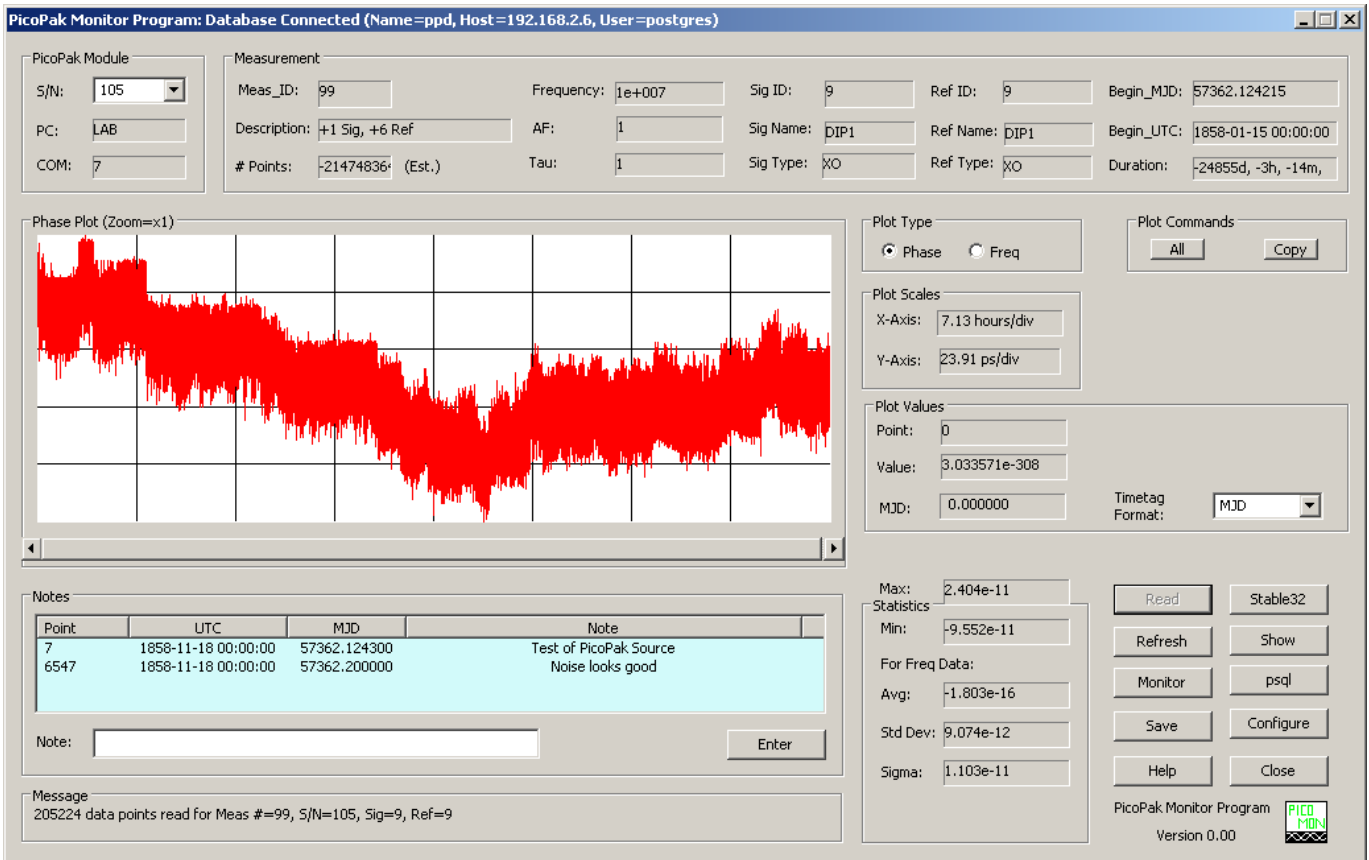
Clock data stored in a PicoPak PostgreSQL database can be accessed using the PicoSQL program, whose main screen is shown below:



PicoSQL Database Access Program Main Screen

- **PicoMon**

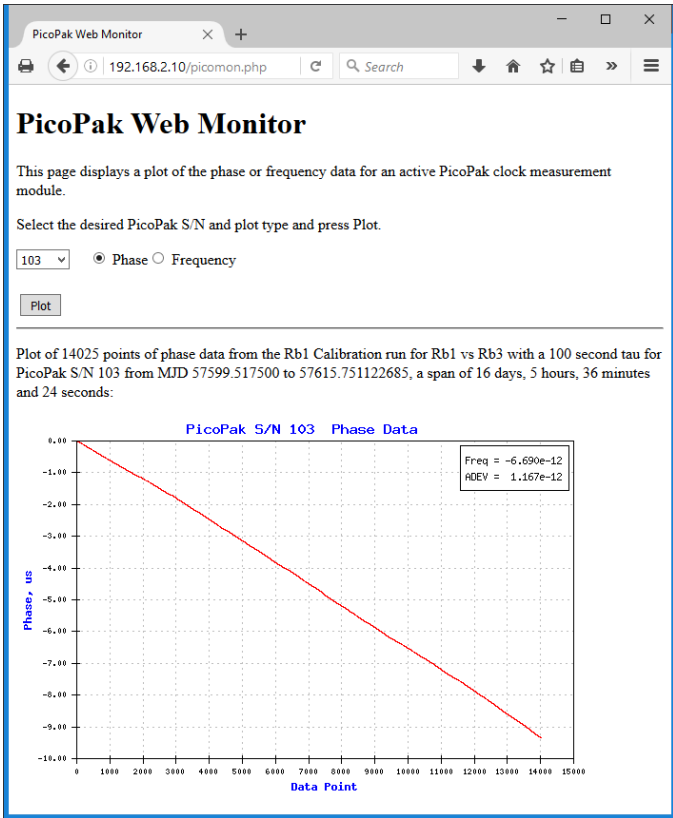
The PicoMon program (PicoMon.exe) supports the monitoring of PicoPak module clock measurements when a PicoPak PostgreSQL database is active. With it, a PicoPak measurement can be observed in quasi-real time and notes can be inserted as the run progresses. The PicoMon main screen is shown below:



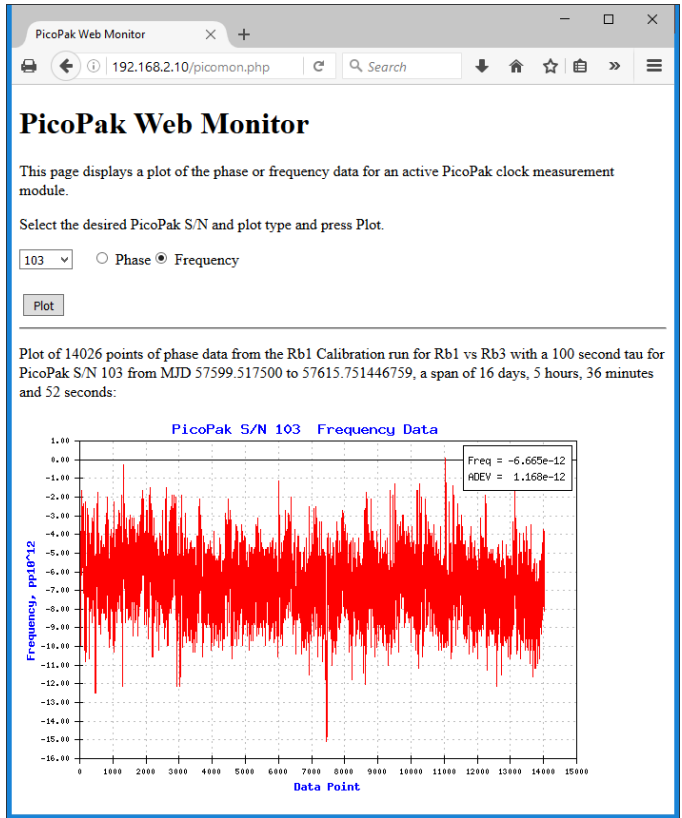
PicoMon Main Screen

• **PicoPak Web Monitor**

The PicoPak Web Monitor a simple web-based server-side PHP script for monitoring active PicoPak and PicoScan clock measurements via an ordinary web browser. The script is typically installed on the same server as the PicoPak PostgreSQL database that supports its operation. The user is presented with a list of the active PicoPak and PicoScan modules, selects one along with the desired data type, and is shown a corresponding plot of the phase or frequency data, which is also written to a data file that can be accessed via ftp. Information is provided about the number of points, the run description, the signal and reference clocks, the measurement tau, the start and end (current) MJDs, and the time span of the run. The phase and frequency data are scaled to engineering units and the fractional frequency offset (based on either the phase slope or frequency average) and the Allan deviation at the measurement tau are shown as plot inserts. Examples of PicoPak Web Monitor screens are shown below.



PicoPak Web Monitor Phase Plot



PicoPak Web Monitor Frequency Plot

- **Enumerate**

The Enumerate (Enumerate.exe) program is a command-line utility to enumerate the PicoPak modules connected to a computer, as shown in the screen shot below:

```

Enumerate USB Devices
FTDI Virtual COM Port USB Device Enumeration
# Devices=3

Device 0:
Device=PicoPak Clock Measurement Module
S/N=103
COM Port=1

Device 1:
Device=PicoPak Clock Measurement Module
S/N=105
COM Port=7

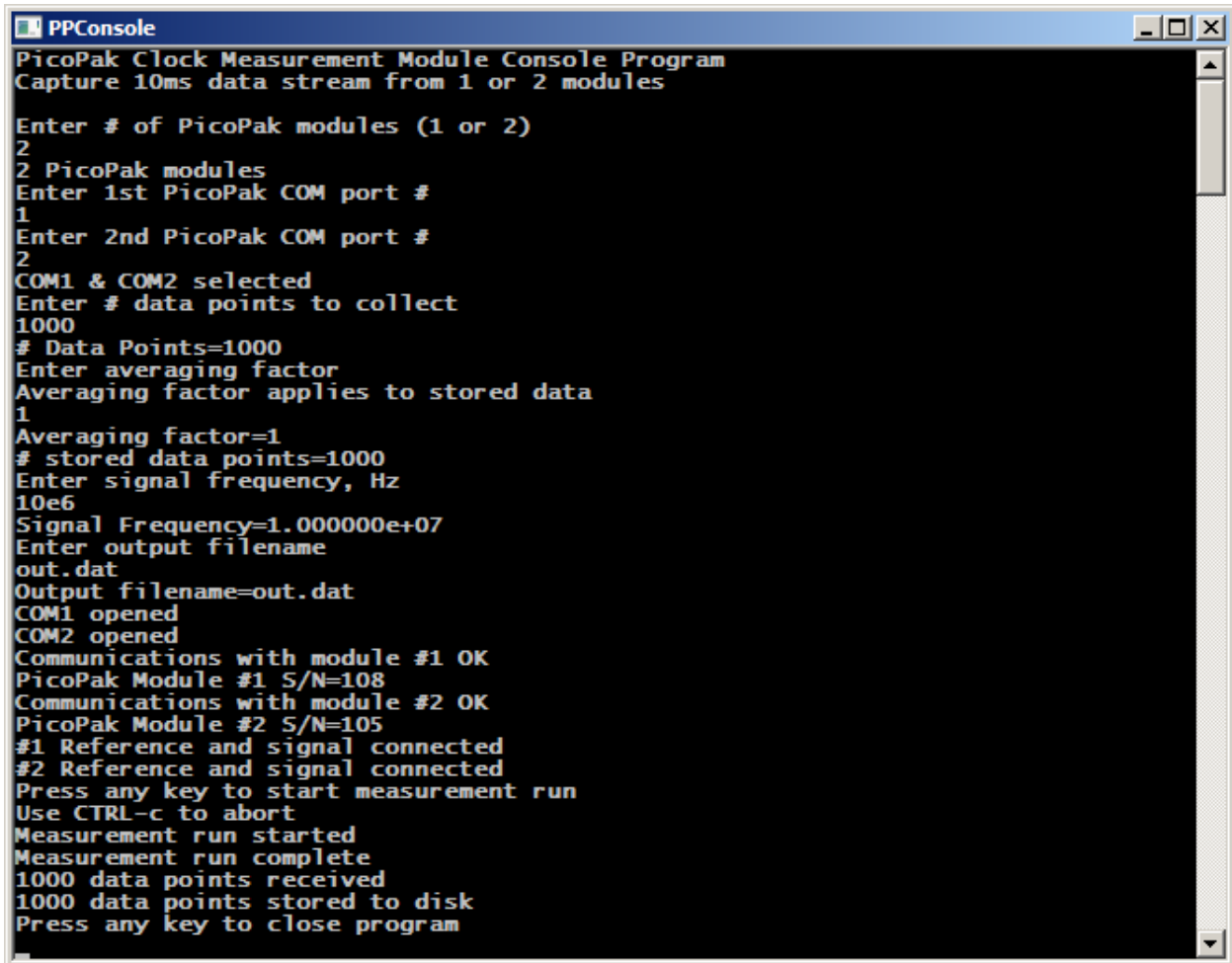
Device 2:
Device=PicoPak Clock Measurement Module
S/N=108
COM Port=3

Press any key to continue . . .
  
```

Enumerate Command Screen

- **PPConsole**

The PPConsole (PPConsole.exe) program is a command-line application to capture 10 ms data from one or two PicoPak modules, as shown in the screen shot below. This is particularly useful for making simultaneous two-channel measurements for a cross-correlation stability analysis.



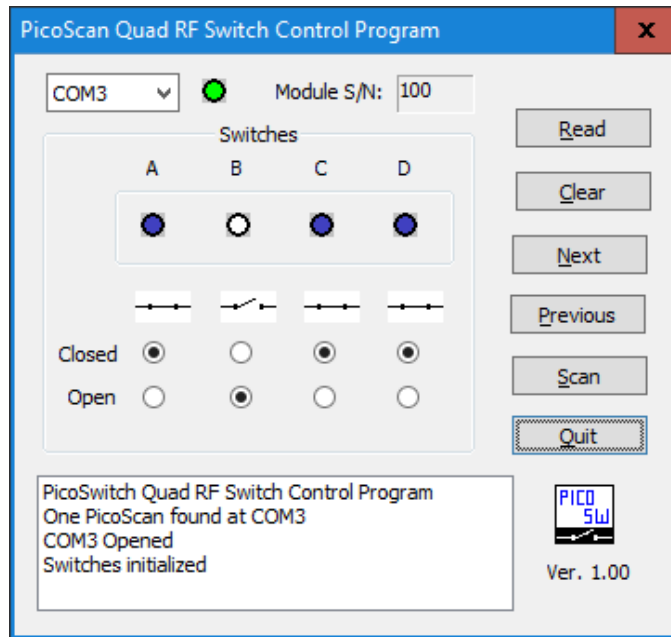
```
PPConsole
PicoPak Clock Measurement Module Console Program
Capture 10ms data stream from 1 or 2 modules

Enter # of PicoPak modules (1 or 2)
2
2 PicoPak modules
Enter 1st PicoPak COM port #
1
Enter 2nd PicoPak COM port #
2
COM1 & COM2 selected
Enter # data points to collect
1000
# Data Points=1000
Enter averaging factor
1
Averaging factor applies to stored data
Averaging factor=1
# stored data points=1000
Enter signal frequency, Hz
10e6
Signal Frequency=1.000000e+07
Enter output filename
out.dat
Output filename=out.dat
COM1 opened
COM2 opened
Communications with module #1 OK
PicoPak Module #1 S/N=108
Communications with module #2 OK
PicoPak Module #2 S/N=105
#1 Reference and signal connected
#2 Reference and signal connected
Press any key to start measurement run
Use CTRL-c to abort
Measurement run started
Measurement run complete
1000 data points received
1000 data points stored to disk
Press any key to close program
```

PPConsole Command Screen

- **PicoSwitch**

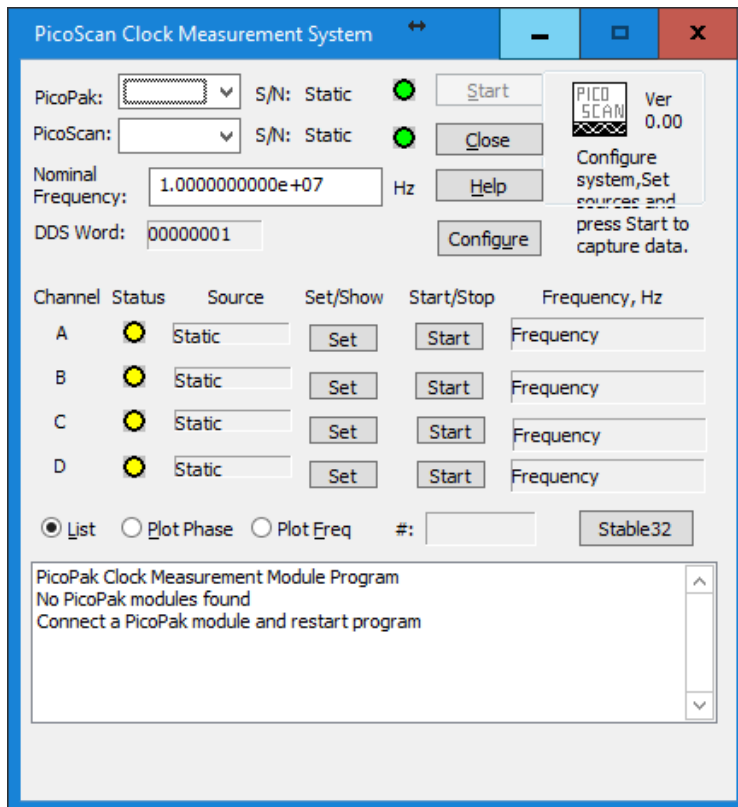
The PicoSwitch program (PicoSwitch.exe) supports the independent operation of a PicoScan quad RF switch module. With it, a PicoScan module can be used to select PicoPak signal or reference channels. For general use, the PicoSwitch program can read its DIP switch settings, clear all switches, select switches, go to the next or previous switch, or scan all or a selected set of switches. The PicoSwitch main screen is shown below:



PicoSwitch Main Screen

- **PicoScan**

The PicoScan program (PicoScan.exe) supports the operation of a PicoPak module clock measurement module along with a PicoScan quad RF switch. With them, 4-channel scanned clock measurements can be made. The PicoScan main screen is shown below:



PicoScan Main Screen

File: PicoPak Software Overviews.doc  
W.J. Riley  
Hamilton Technical Services  
December 8, 2015  
Rev A. March 17, 2016  
Rev B. August 20, 2016