MANAGING LARGE DATA FILES IN PRORAE REMOTE

INTRODUCTION

ProRAE Remote software, used with wireless systems such as AreaRAE, has the ability to export data in Rich Text Format (RTF), which permits other applications such as Microsoft Word, Excel, and Access to import and/or view the data. Occasionally, there is a need to amass and analyze very large datalog files that exceed the maximum file size of Excel or even the storage capacity of the computer. To avoid having to interrupt the measurements to download before files become too large, we offer a tool for breaking large files into smaller, more manageable files, after measurements are complete.

Processing Speed

Excel has a 65,536 record limit, and graphs are limited to 32,000 records. Even today's fast computers may bog down when managing files with more than 5,000 records. A very large Excel file also influences the speed of other applications as they all vie for available system resources and memory. Keep in mind that everyone viewing the data may not have an up-to-date computer, and even though the computer generating the data can process it quickly, other, older computers may become exceedingly slow. On most computers purchased after 2002, Excel generally gives acceptable results with up to 5,000 records. Using trial and error on computers purchased before 2002, it yields an acceptable record limit.

Calculate the Number of Records

When ProRAE Remote is set up to Save Every Record, use the following equation to calculate the number of records:

$$R = U_N * T_S/I_S$$

Where R = Number of records;
U_N = Units being polled;
T_S = Total datalogging time in seconds;
I_S = Polling interval in seconds;

Example: An AreaRAE system has 4 AreaRAEs (U_N), the total datalog time is 24 hours (86,400 seconds), and the polling interval is 60 seconds.

$$U_N \quad = 4$$
$$T_S \quad = 86,400 \text{ seconds}$$
$$I_S \quad = 60 \text{ seconds}$$

Substituting these values into the equation, we get:

$$R = \frac{4 \text{ Records} * 86,400 \cancel{\text{ seconds}}}{60 \cancel{\text{ seconds}}} = 5,760 \text{ records}$$

This file size is near the maximum that can be easily handled by Excel on most recent computers. It may be necessary to increase the polling interval to reduce the number of records. When ProRAE Remote is set up to "Save Alarm Record Only," the number of records is indeterminate because alarms are generally a random occurrence.

Calculate the File Sizes

There are two file sizes that must be known in order to determine a backup strategy. The first is the size of the raw data file created by ProRAE Remote during datalogging. As a default, this file is stored in the same folder as the ProRAE Remote software: C:\Program Files\ProRAERemote. The second file size is the RTF export file that ProRAE creates when exporting the data. During the export operation, the folder location can be set to anywhere accessible by Windows Explorer, including network drives.

The length of the raw data file created by ProRAE Remote is dependent on the number of records and the configuration of the instrument. The minimum record length is 50 bytes for a 4-sensor unit, and the maximum is 69 bytes for a 5-sensor unit with GPS. For non-GPS units, it is safe to use 60 bytes per record. The equation to calculate file size is:

$$R * n_{BYTES}$$

Where R = Number of records;
n_{BYTES} = Number of bytes per record;

Example: Let's assume the example above has four GPS AreaRAEs. Then the file size for the 24-hour datalog period is:

$$5760 * 69 = 397,440 \text{ bytes, or } 397 \text{ kbytes.}$$

This file size is for all four units. In ProRAE Suite, each unit has its own datalog file (RTU_x.DAT; where x = Unit ID) and each unit's datalog files are exported separately. The individual file's size is the total file size divided by the number of units being datalogged. File size calculations are not exact because the Windows Operating system may add a few bytes to each file. The exported RTF file is approximately 40% larger than the raw log file, or 556K bytes.

Backup Strategy and Intervals

The backup strategy needs to cover historical data and current data. As seen from the earlier discussion, it becomes clear that the file sizes can become quite large. In the example above, where the polling interval is once every 60 seconds, after one month the file is 12Mbytes, and at one year the file size is approximately 144 Mbytes. A computer that is more than two or three years old could easily choke on these files, and it may be necessary to increase the polling interval to reduce the file size. When datalogging every second the Datalog file size is 60 times the sizes given above, and after 24 hours the file size is 24 Mbytes. After one year, the files grow to 8Gbytes which can choke most computers, even if purchased after 2002. There are a number of options that can be used for backing up historical data including (listed from slowest to fastest response): Digital Audio Tape (DAT), ZIP drives, CD-ROM, DVD, and network drive. Look at the data retention requirements and the size ofthe logged files to determine which backup system meets your needs.

For short-term storage, look at available system resources on the computer that has ProRAE Remote installed on it. In the example above, a safe file size for Excel is around 24 hours. Use database software such as Access or the RtfChop utility, described later, to view larger files.

To simplify data reviewing in Excel, RAE Systems has created the RtfChop utility that chops the files into smaller user-defined segments. The following sections describe how to use RftChop and import the data into Excel.

Installing RtfChop

To obtain the RtfChop utility, check the RAE Systems website at www.raesystems.com, or call RAE Systems customer service. RtfChop does not have an installer. The file can simply be stored in any folder on the computer. Many corporate network firewalls and email programs prevent opening executable files from remote locations. RAE Systems provides the utility compressed in .zip format, and the file can be unzipped locally and stored on the computer along with ProRAE Remote. RtfChop does run from the Start menu, and the simplest place to store it is on the Windows desktop. The icon shown to the right is the RtfChop icon that is observable on the Windows desktop after unzipping it.

Running RtfChop

Double-Click the RtfChop icon to start the utility, and the dialog box below appears. The call-outs describe each section of the dialog box. Once all parameters are set, click the "Chop It!" button.

This is the path and file name of the file to be chopped. Click the ellipsis (...) button to use Windows Explorer to navigate to the desired file folder. By default, ProRAE Remote exports to the same directory ProRAE Remote is installed in.

This is the path and file name of the chopped file. Click the ellipsis (...) button to use Windows Explorer to navigate to the desired folder. RtfChop automatically appends a sequential number to each file created.

Using the calculations from text above set the number of records to the desired limit.

If every record is not needed, then select this option. When using this option, the file size is smaller, but RtfChop skips records even if there is an alarm.