INSTRUCTION MANUAL

Baler
Revision: 12/09

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Baler

Baler is a LoggerNet client application that allows you to set up a schedule on which data will be retrieved from the LoggerNet server and saved to a file on a remote computer. Tables are selected for baling from the dataloggers in the LoggerNet network. The Baler will create a separate file for each selected table. The data can be saved in TOAC1, TOA5, TOB, or CSV format.

The term "baling" is used in this application because of how files are saved to disk. The user specifies an interval on which data will be stored, and once "baling" is started, data is saved in interval-sized packets or "bales".

1. Installation

1.1 CD-ROM Installation

The following instructions assume that drive D: is a CD-ROM drive on the computer from which the software is being installed. If the drive letter is different, substitute the appropriate drive letter.

1. Put the installation CD in the CD-ROM drive. The install application should come up automatically. Skip to step 3. If the install does not start, then from the Windows system menu, select Start | Run.

2. Type D:\Setup.exe in the Open field or use the Browse button to access the CD-ROM drive and select the setup executable.

3. This activates the Baler Installation Utility. Follow the prompts on the screen to complete the installation.

An item is added to your computer's Start menu under Programs | Campbell Scientific | Baler. If the default directories are used during installation, the Baler executable and help files are placed in the C:\Program Files\CampbellSci\Baler directory. The directory C:\CampbellSci\Baler is a working directory and contains subdirectories for the user's data files.

1.2 Allowing Remote Connections

The LoggerNet toolbar offers the option to "Allow Remote Connections." This feature can be advantageous in some instances, but it can also increase the vulnerability of your LoggerNet network. Careful consideration should be given when deciding whether or not to allow remote connections.

LoggerNet is a client/server application, and therefore, the server can run on one computer while a client application can be run on a separate computer attached to the same network. The Baler takes advantage of this remote access capability. If Allow Remote Connections is enabled, you can run LoggerNet on one computer, and use the Baler to save a copy of the data on the remote computer. If remote connections are denied, data access from a remote computer is not possible.

Though this may be a desirable feature, enabling Allow Remote Connections also makes your LoggerNet network configuration vulnerable to changes by other parties on the network. LoggerNet comes with a command line utility called CoraScript (Section 10.2 of the LoggerNet manual). This utility can be used to create a back-up script of your network and troubleshoot problems. However, it is possible that another user could use CoraScript to make unwanted changes to the datalogger network, including changing the data collection schedule or deleting devices entirely. We, therefore, recommend that this feature be disabled, unless it is essential that the data be made available to a remote computer running the Baler or other remote LoggerNet client.

This option can be enabled/disabled from the LoggerNet Tools menu. LoggerNet must be restarted for the change to be effective.

2. Baler Settings

The first step in setting up the Baler is to select the tables that will be saved to file. Each datalogger in the network will be listed in the Stations list. When a datalogger is selected with the mouse pointer, all of its tables will be listed in the Tables From list. To select the tables that will be saved to file, highlight them with a click of the mouse pointer and use the arrow buttons to move them into the Selected Tables field.
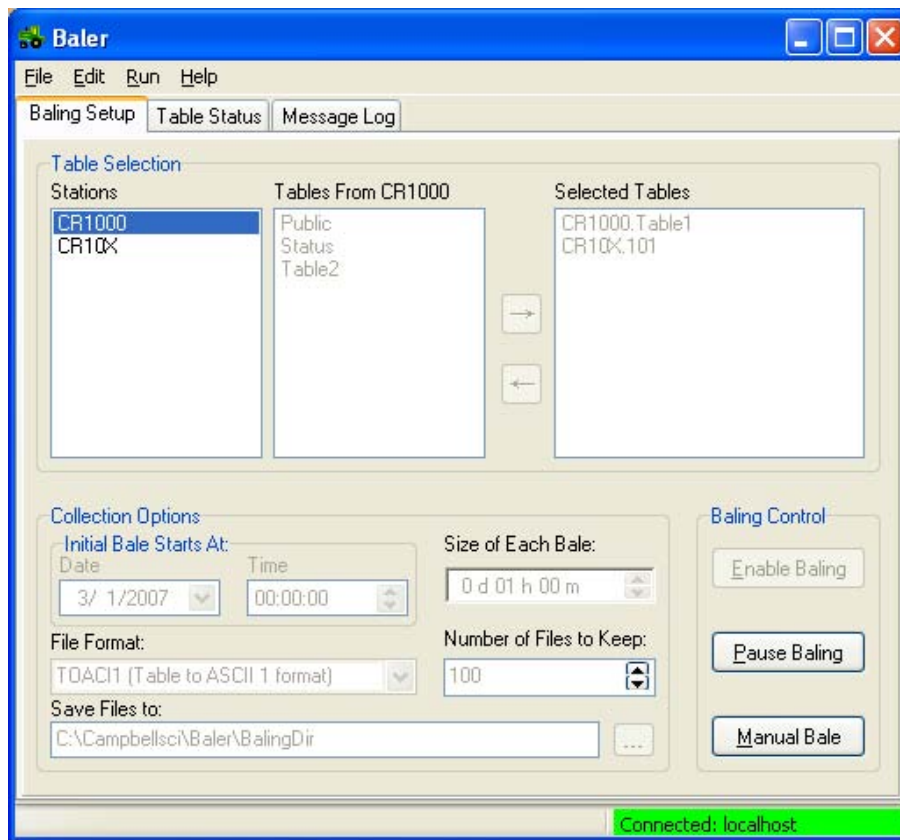

FIGURE 2-1. Baler Main Window

Only tables that are enabled for scheduled data collection in LoggerNet can be baled. All of the tables for the datalogger are listed, whether enabled for collection in LoggerNet or not. If you select a table that is not enabled for collection the "Enabled" column on the Table Status tab will indicate that the chosen table has not been enabled for scheduled collection. All tables scheduled for collection and available for baling from the dataloggers in the network can be selected from the menu by selecting Edit | Select All Enabled Tables.

Next, set the initial time to start baling and the interval on which to bale. The date can be typed directly into the Date field, or, if the arrow button to the right of the Date field is selected, a calendar will appear. The current date is enclosed in a red box and is listed at the bottom of the calendar. The date on which to start baling is indicated by a solid box. To select a date, click it with the mouse pointer. The arrow buttons to the left and right of the Month/Year can be used to move forward or backward in the calendar, month-by-month.

The time to start baling is specified by the entry in the Time field. A time element is selected by clicking it. The arrow buttons to the right of the Time field can be used to increase or decrease the selected time element, or you can enter a time into the field directly. Note that all subsequent baling attempts will be based on the time set up in this field.

NOTE	Once baling has begun for a table, baling will continue on the same schedule even if baling is paused and then restarted. The only way to change the Initial Bale Starts At Date and Time is to remove the table from the baling setup and then reselect the table.

The schedule for how often baling will occur is entered into the Size of Each Bale field. This field is in the format 00 d(ays) 00 h(ours) 00 m(inutes). As with the Time field, the arrow buttons to the right of the field can be used to scroll through each time element, or the bale size can be entered into the field directly. As an example, the Time and Bale Size shown in the example main window would set the first baling event to begin at midnight, March 1, 2007, and subsequent baling events would occur every hour. Each file saved to disk would contain one hour's worth of data. If there is no new data available for a particular table, no bale file will be created for that table.

The Baler creates the baled files based on the time stamp of the last record of collected data for a particular table. As new data is collected, the Baler stores it in a temporary file (with a *.tmp extension) until a record is retrieved that completes the bale. This results in data files that have "even" intervals. For instance, an hourly bale of 1 minute data would contain 60 records, with a time stamp from the top of the first hour to the top of the next hour (e.g., one minute data, starting at 10:00 through 10:59). Note that there may be some delay between the time the data is actually stored to the datalogger's final storage and the time the baled file is created, based on when the scheduled data collection takes place in LoggerNet.

3. File Naming and Directory Structure

The file names under which the data will be saved is not user selectable. However, the user can select the directory in which to save the files. The default directory for saving files is c:\Campbellsci\Baler\BalingDir. The user can change the base directory by pressing the Browse button to the right of the Save Files To field and selecting a new directory from the resulting dialog box.

A subdirectory is created in the chosen base directory for each datalogger from which data will be retrieved. The subdirectory name reflects the name of the datalogger. The file naming convention used by the Baler is based on the table name, the current date, and the time stamp for the first record in the file. For instance, the file name OneMinute_2003_06_16_1200.dat indicates that the table name in the datalogger was OneMinute, the file was created on June 16, 2003, and the first record has a time stamp of 1200 (hh mm).

| **NOTE** | A command line option can be used to change the file name from TableName_Date to Date_TableName. See Section 6.4. |

4. Number of Files to Keep

The Baler is used to retrieve data from the LoggerNet server's data cache, and save this information to disk on a remote computer. It is expected that this data will be used for archive and analysis purposes, and that the data files will be consolidated or manipulated and saved to a different file name or a different device.

To prevent filling up your hard disk with data files, the Baler has a Number of Files to Keep field. Enter the maximum number of files that should be saved to the hard disk for each table. When this maximum number of files is reached, the oldest files will be deleted as newer files are saved.

5. File Format

By default, data is stored in a TOAC1 format. The File Format option allows the selection of a different format: TOAC5, TOB, or CSV.

TOACI1 - Comma separated format. Header information for each of the columns is included.

TOA5 - Comma separated format. Header information for each of the columns is included, along with field names and units of measure if they are available.

TOB1 - Binary format. Though this format saves disk storage space, it must be converted before it is usable in other programs.

CSV - Comma separated format. No header information is included.

6. Baler Operation

6.1 Baling Controls

Baling can be controlled by the buttons on the main window, or by selecting them from the Run menu.

Enable Baling - When baling is enabled, temporary files are created for each table selected for baling (if data exists for the tables). As new data is collected by the server, the records are placed in this temporary file. Data is saved to a permanent file when the baling conditions are met.

Baling can be paused by selecting the **Pause Baling** button.

If a **Manual Bale** is initiated, the temporary files will be saved to a permanent file, just as if the baling interval had been reached.

When the Baler is closed, the temporary files are maintained. When the Baler is reopened, data storage to the temporary files will resume.

6.2 Table Status and Messages

Table Status tab - You can review the status of the tables set up for baling by switching to the Table Status tab. This window provides a list of the tables selected for baling, the number of records saved the last time the table was baled, the time of the last bale, the timestamp in the datalogger that will cause the next bale to occur, and whether or not the table is being collected on a schedule by LoggerNet. Note that the actual time the next baled file is created will vary slightly from the time reflected in the Time of Next Bale field since the bale is not created until all the records to be included in the bale have been collected from the datalogger.

FIGURE 6-1. Table Status Tab

Message Log tab - The Message Log displays status messages that reflect the LoggerNet server's data collection attempts with the dataloggers, and the operation of the Baler. Select Edit | Wrap Messages to enable/disable line wrap in the message log display. To clear the messages from this window, select Edit | Clear Messages from the Baler menu.

Baler messages can be included in the LoggerNet server's transaction log by selecting Edit | Log Messages.
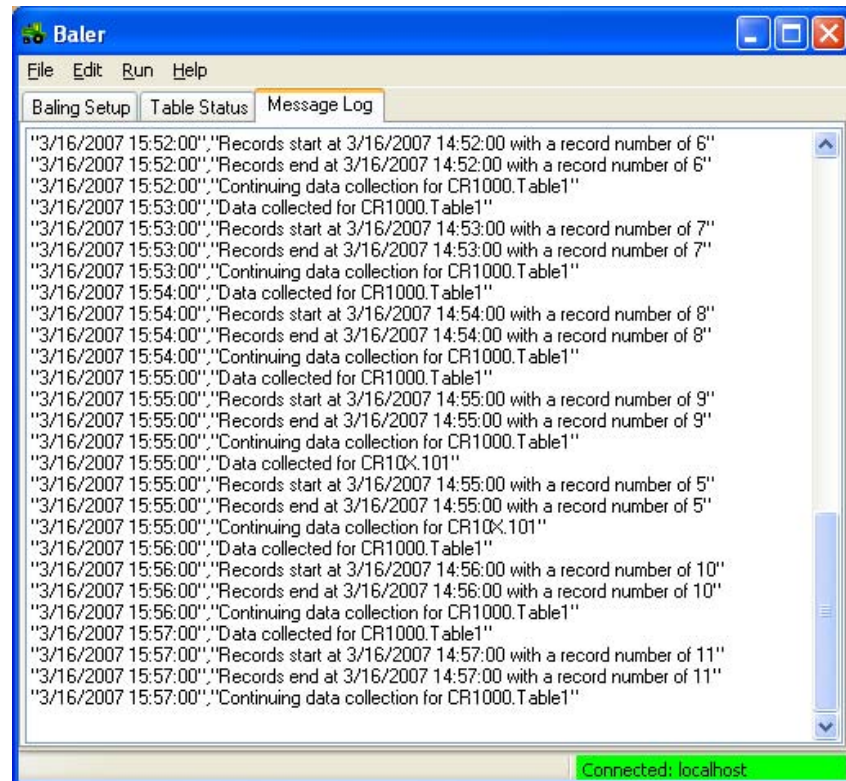

FIGURE 6-2. Message Log Tab

6.3 Auto Start

If **File | Auto Start** is enabled, after a brief pause the Baler will attempt to connect to the server and start baling when the application is started. If a short cut to Baler is put in the Windows start up folder, this will allow an automatic restart to be set up in case of a power failure or machine crash.

6.4 Wait for Holes

When a data collection attempt is made from a table-based datalogger, depending on LoggerNet's data collection mode, data may not be retrieved in the order it was recorded by the datalogger. LoggerNet may request the most recent record first and then back-fill the data. If a data packet is corrupted while being transmitted, the server will discard this packet and request that it be sent again. In the meantime, other packets of data may be received

successfully. This data collection method may create areas in the data cache where data is missing. The discontinuity in the collected data is referred to as a hole.

Baler's default behavior is to bale on schedule regardless of holes. If a hole is encountered in the LoggerNet cache, the resulting bale may have one or more missing records or the records in the bale may be out of order. If records are missing from the bale, when LoggerNet eventually collects the hole, the records will be added to a subsequent bale. They will, therefore, be found in a different bale than would be expected based on filenames. Select Edit | Wait for Holes to force Baler to wait until holes are filled before continuing to bale.

6.5 Command Line Options

/WorkDir

Multiple instances of the Baler can be run, and separate directories can be specified for the data files. This is done by setting up a separate shortcut for each instance to be run and using a command line option to start the Baler. The syntax is shown in the following command line:

c:\Program Files\CampbellSci\Baler\Baler.exe (/WorkDir = *pathname*)

where "*pathname*" is a valid directory path on the computer file system. Each instance of the Baler started in this manner will save its setting in a separate *.ini file. This initialization file is saved to the directory specified by the "*pathname*" command line argument.

For example, a shortcut with the following as the command line in the "Target" window would start the Baler using the initialization file stored in the directory " c:\Campbellsci\LoggerNet\Baler1" .

c:\Program Files\Campbellsci\LoggerNet\Baler.exe   /WorkDir=c:\Campbellsci\LoggerNet\Baler1

/r

The /r option is used to change the name of the file that is created by the Baler from TableName_Date (e.g., OneMinute_2003_06_16_1200.dat) to Date_TableName (e.g., 2003_06_16_16_1200_OneMinute.dat). The syntax for a Windows short cut would be:

c:\Program Files\Campbellsci\Baler.exe /r

7. Advanced Options

The user can specify a program to run 30 seconds after a baling event occurs. (The 30 second timer is reset after each baling event. Therefore, the program will not be launched until 30 seconds have elapsed without a baling event.) This program can be an executable file or a batch file. To set up a program to be run, select Edit | Advanced Options and enter a file name in the File to Execute field. You can type in the program name directly or press the Browse button to the right of the field to display a standard file dialog box to search for a file.   If command line options are required for the executable, enter those

into the Command Line Options field. A working directory for the executable can be entered into the Start In field.

NOTE	Always enter the full path when specifying the file to execute. Otherwise, the file may not be found or may not run as expected. Paths with spaces must be put inside quotation symbols.

8. Importing Files into Other Applications

All of the file formats except TOB are a variation of a comma-delimited file. Comma delimited files can easily be imported into a spreadsheet program for analysis or manipulation. (Instructions are given in Appendix G of the LoggerNet manual for importing a TOAC1 file into Microsoft Excel.) Similar procedures will work with most other spreadsheet or database applications.

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