CMMUsage Users Guide

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Introduction

The *CMMUsage* utility allows collection of usage data from the CMM software focusing on run time, idle time, and off time. In addition to usage data the touch trigger point count and any errors reported by the controller are recorded and can be reviewed for troubleshooting purposes. The data is stored in a SQLite database and can be accessed directly from any suitable software or exported to a CSV or text file from the *CMMUsage* utility for review.

The recorded error messages and touch trigger probe count may be of particular use. As often the case intermittent errors are not always recorded by the user but, with this utility, the date, time, program name, and text of the error message is saved and can be reviewed at a later date. The touch trigger probes have a finite lifespan based on the number of touches. Using a sample of typical usage data it would be possible to estimate when the limit of touches has been reached.

Overview

The *CMMUsage* utility interface is shown in illustration 1:

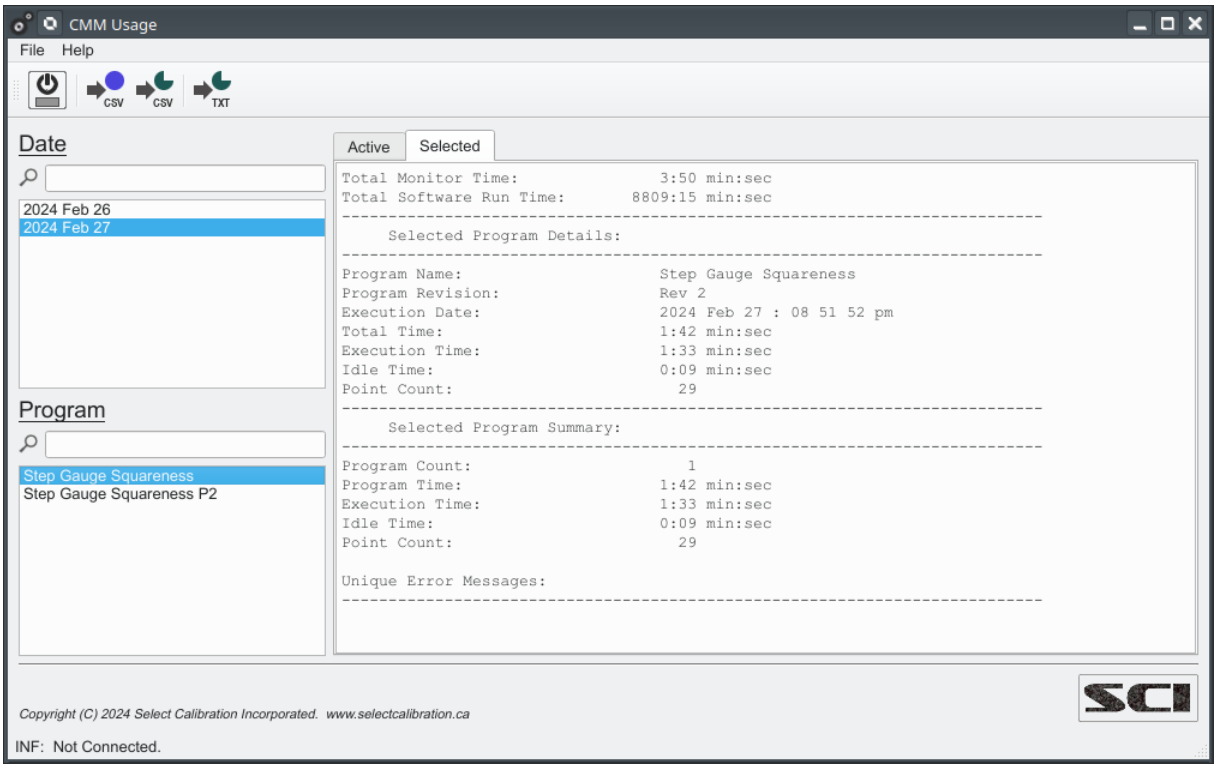

Illustration 1: CMMUsage main window.

Table 1: Toolbar Options

Icon	*Description*
	Monitor mode and state. When clicked the software will watch for signals from the inspection software. The bar at the bottom of the power button icon will be either gray

Icon	*Description*
	(off), yellow (waiting for the inspection software to appear), green (connected to the inspection software), or red (error).
	Export all data collected to a CSV file. The first line of the created file includes column identifiers for the data.
	Export selected data to a CSV file. The first line of the created file includes column identifiers for the data.
	Export the current summary report to a text file.

Data Capture

Capturing usage data from the inspection software is automatic once the Monitor function is active. The *CMMUsage* utility will monitor the opening and closing of part programs and record usage data and any controller error messages automatically. The *Active* view of the data will show the current data for any active part program. With the monitor function active the *CMMUsage* utility can be ignored or minimized.

Only data for online programs is recorded. Offline programs are ignored.

Table 2: Data capture information in Active view.

Name	*Description*
Collection Active	Indicates if the data from the active part program is recording. When green, it is recording and when gray it is not recording.
Program Name	Name of the part program. The file path is not included in the name.
Program Revision	Revision of the program. Optional field that can be used to help track changes in a part program.
Execution Date	Today's date if there is an active part program.
Open Time	Total time the part program is open. The is the sum of the execution time and the idle time.
Execution Time	Total time the open part program is running.
Idle Time	Total time the open part program is not running.
Point Count	Total number of touch points recorded from the active part program.
Last Error Messasge	Last message received from the controller.
[text]	Various messages from the software including when specific events are captured.

Data Report

Captured data is displayed in the *Selected* view. The data in this view only shows details from the

currently selected programs and dates. To display all data then select all dates and programs. An example of the type of information reported is shown below:

```
Total Monitor Time:              76:23 min:sec
Total Software Run Time:         42:25 min:sec
-------------------------------------------------------------------------
     Selected Program Details:
-------------------------------------------------------------------------
Program Name:                     B89.4.10360 Rpt
Program Revision:                 Version 2.1
Execution Date:                   2024 Mar 22 : 09 41 00 am
Total Time:                       1:48 min:sec
Execution Time:                   1:30 min:sec
Idle Time:                        0:17 min:sec
Point Count:                        46
-------------------------------------------------------------------------
Program Name:                     B89.4.10360 Rpt
Program Revision:                 Version 2.1
Execution Date:                   2024 Mar 22 : 09 52 21 am
Total Time:                       1:55 min:sec
Execution Time:                   1:30 min:sec
Idle Time:                        0:25 min:sec
Point Count:                        18
Controller Messages During Execution:
 ERROR CE ,S%1 ,TR_CE ,0x1400304d Position out of the machine stroke limit on Z axis
-------------------------------------------------------------------------
     Selected Program Summary:
-------------------------------------------------------------------------
Program Count:                       2
Program Time:                     3:43 min:sec
Execution Time:                   3:00 min:sec
Idle Time:                        0:42 min:sec
Point Count:                        64

Unique Error Messages:
-------------------------------------------------------------------------
 ERROR CE ,S%1 ,TR_CE ,0x1400304d Position out of the machine stroke limit on Z axis
```

The entries at the top of the report for the *Total Monitor Time* describes how long the *CMMUsage* utility has been monitoring for events while the *Total Software Run Time* is how long the inspection software has been open. The software run time shows how long the inspection software is actually running even if no programs are open.

The individual program entries are displayed separately followed by a summary of the selected programs. The list of error messages shown at the bottom of the summary has all duplicates removed.

Due to the potential for large amounts of data and the amount of time required to refresh the report the summary data is handled in a separate thread. The report data will appear when the data is ready to be displayed. The separate thread allows the CMMUsage utility to operate normally while simultaneously generating the report.

Database

The collected data is stored in a SQLite database. The location of the database is in the folder *.cmmusage* in the users home folder. The name of the database is simply *database.db*.

The data can be accessed by a variety of utility programs. It was decided not to incorporate maintenance functions into the *CMMUsage* utility as this can be handled by existing utilities. The data is not encrypted, protected, or attached to a specific user with a password. Any existing software that is able to work with SQLite databases should work.

On startup the database is checked and verified to contain the required tables. If the database does not exist or one or more of the required tables is missing the database will be created and initialized.

The layout of the database table can be shown using the following SQLite command:

```
PRAGMA table_info('table_name');
```

where 'table_name' is the name of the database table to inspect.

Database Tables

The following shows the layout of the tables used by the *CMMUsage* utility.

Table 3: Database Table 'program'

Name	*Type*	*Primary Key*	*Comment*
program_id	INTEGER	Yes	Unique value used to cross reference other tables in the database.
name	TEXT	No	Name of the part program
revision	TEXT	No	Revision number of the part program
date	TEXT	No	Program date of execution.
time	TEXT	No	Program time of execution.

Table 4: Database Table 'program_data'

Name	*Type*	*Primary Key*	*Comment*
program_id	INTEGER	No	Unique value defined in the table 'program'.
execution_time	INTEGER	No	Time in seconds for running program.
idle_time	INTEGER	No	Time in seconds for an open program that is not running.
point_count	INTEGER	No	Number of points measured (individual touches, not features).

Table 5: Database Table 'program_message'

Name	*Type*	*Primary Key*	*Comment*
program_id	INTEGER	No	Unique value defined in the table 'program'.
message	TEXT	No	Text of a single error message from CMM controller.

Table 6: Database Table 'usage'

Name	*Type*	*Primary Key*	*Comment*
software_monitor_time	INTEGER	No	Total time the *CMMUsage* utility is open and waiting for events.
software_run_time	INTEGER	No	Total time the inspection software is running.

Illustration 2 shows an example of using the Qt SQL Browser to get a list of all the error messages from a specific part program outside of the *CMMUsage* utility. It is not easier to do it this way but does demonstrate how any suitable utility can be used to query collected data.

Illustration 2: Example of all error messages recorded for the program assigned to program_id of 20.

Menu Options

Table 7: Menu Options

Options	*Description*
File – Monitor	Enable or disable monitoring the inspection software for usage data.
File – Export All CSV	Export all the data contained in the database to a CSV file.
File – Export Selected CSV	Export the selected part program data to a CSV file.
File – Export Selected TXT	Export the selected part program data to a text file. The format of the text file is identical to the view shown by the *CMMUsage* utility.
File - Quit	Close the *CMMUsage* utility.

Revision History

Date	*Version*	*Changes*
Mar 24, 2024	1.0	New Program