Mean Time Between Failure (MTBF)

Today's market offers many product choices. This is particularly true in the touch industry, where many manufacturers claim their models have specifications the same as or similar to Elo Touch Solutions products. While specifications are key to setting minimum performance requirements, it is important to remember that not all touch displays are built the same, even though their specifications may appear to be very similar. During the development process of new products and continuing on even after release, Elo Touch Solutions products are subjected to a rigorous battery of tests to expose potential weaknesses of the system under extreme stress. The results of these tests provide insight into potential changes to the products prior to release and for on-going quality improvement. These tests include:

- Accelerated Life Test
- Accelerated Stress Screening
- Voltage, Current, Temperature and Vibration Tests
- Ongoing Reliability Tests
- Regulatory agency Tests

In addition, many factors affect product life and performance over time, and their impact cannot be completely measured during testing. Examples of these factors include:

- Usage environment
- Temperature and humidity variations
- Sunlight exposure
- Electrical line conditioning to protect from lightning

As a result, stating a "normal" life expectancy of an electrical appliance is not feasible. Therefore, electrical products use the industry standard term Mean Time Between Failure (MTBF) as a statistical prediction of the elapsed time between failures in a large population of systems. Elo Touch Solutions products meet the following criteria:

- The MTBF of all Elo Touchmonitors and TouchComputers shall be 50,000 hours.
- A failure is anything that causes the product not to function to its specifications.
- Reduction in brightness due to backlight life is not included as a failure.

The backlight life is dictated by the LCD manufacturer's specification. Backlight life is the approximate time at which the brightness decreases to half of its original brightness. Reduction in brightness due to backlight life is not considered a failure, it is the natural aging of all electronic components.

- Hard failures of the backlight which make the monitor not readable are included as failures.
- If the LCD used in the system exceeds its pixel defect specification it is considered a failure.
- The MTBF is to be measured using the actual system under consideration.
- The tests may be done using multiple systems to shorten the test time.
- Accelerated testing may be done using elevated temperatures.

MTBF Definition[1]

MTBF is the mean of a distribution of product life calculated by dividing the total operating time accumulated by a "defined group" of devices within a given time period, by the total number of failures in that time period. MTBF is the mean time between failures during the useful life of the product. Example: If the useful life of a device is deemed to be 20,000 hours (~ 2.3 years at 24 hrs/day, 7 days/week, 356 days/year), it would have an MTBF of 60,000 hours if : 150 units were run for 20,000 hours and 50 units failed during the last hour. Total MTBF time = # of units (150) x Time on (20,000 hours) = 3,000,000 unit-hours divided by the number of failures = 60,000 hours MTBF.

MTBF measurement is based on a statistical sample and is not intended to predict any one specific unit's reliability; thus MTBF is not, and should not be construed as a warranty measurement.

Common MTBF Misconceptions

MTBF is commonly confused with a product's useful life, even though the two concepts are not directly related. For example: A battery may have a useful life of four hours and an MTBF of 100,000 hours. In a population of 1,000,000 batteries, there will be approximately ten failures every hour during a single battery's four-hour life span. For typical distributions (with some variance), MTBF represents a top-level aggregate statistic only. This, along with the environmental factors previously noted, means that MTBF is not suitable for predicting specific time to failure.

Global Service and Support

We know that downtime is costly and frustrating, and problems do occur. As a result, we take resolving them very seriously. We have in place a comprehensive global service and support network to provide service near the local region where the product is being used. That support includes:

- Global technical and customer support:
  - https://www.elotouch.com/support/technical-supporthttps://www.elotouch.com/support/customer-service
- 3 year warranty standard on all touchmonitor and touchcomputer products
- 1 to 2 year Extended Warranty is available: https://www.elotouch.com/support/extended-warranty/
- Advance Unit Replacement warranty on many products: https://www.elotouch.com/support/aur/

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[1] Source: http://en.wikipedia.org/wiki/Mean_time_between_failures