

Service Indicator Standard VITA 40-2002

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Overview

Service Indicator Standard...

- Part 1: Background
- Part 2: VITA 40 Design Goals
- Part 3: Reference Guidelines
- Part 4: Recommendations

Part 1

Background

Part 1: Background

Why we care...

- More than 30% of all system outages are the result of human error
- Outages can be VERY costly
- An effective LED strategy can reduce errors and improve availability

Background

Operational environments are changing...(people)

- Trend toward less qualified users
- Downsizing is reducing staff size
- No longer have “apprenticeship” learning environments
- Fewer mentors or experts are available to give help
- Fatigue common due to 24/7 uptime

Background

Operational environments are changing...(equipment)

- Multi-vendor, multi-technology, multi-unit environments are norm
- Trend toward unmanaged environments (console use not required to effect repairs)

Background

Operational environments are changing...(consequences)

- Business models now totally depend on equipment uptime
- Company valuation is tied to system availability
- Trend toward availability guarantees
- Everyone is to blame if there is an outage (S/W, H/W, apps, OS)

Background

Some comments about human error...

- Human Error: any action or omission that causes results that users neither foresee nor intend
- Errors happen
- System designs can encourage errors or reduce the probability of their occurrence

Background

Definition of “Fault”...

- Fault: any condition that is considered unacceptable for normal operation of the component
- The definition of “Fault” varies with the operational environment
- For the purposes of this guideline, “service action required” equals “fault”

Background

Some comments about LEDs and Availability...

- A good LED strategy can reduce ambiguity and repair task complexity
- Situational ambiguity causes delays and creates an environment in which error is more likely to occur
- Delays and errors in effecting repairs relate directly to Mean Time to Repair (MTTR), which impacts availability

Background

Some comments about the need for standards...

- There are a few LED standards like Telcordia GR-2914-CORE, and they don't agree, have limited focus
- There are few standards even within companies
- Multivendor environments are the rule; LED implementations are often contradictory

Part 2

Design Goals

Design Goals

To maximize system availability...

- Minimize ambiguity
- Minimize the probability of human error
- Maximize intuitiveness
- Provide timely, useful, and meaningful feedback
- Provide consistency

Part 3

Reference Guidelines

Reference Guidelines

Other standards related to VITA 40...

- MIL-STD-1472F
- Telcordia GR-2914-CORE
- IEC NEC 73

Part 4

Recommended Standard

Recommended Standard

Focus on consistency and simplicity...

- 5 colors
- 6 states or behaviors
- Consistent placement and spacing
- Minimum luminance and viewing angle is specified
- Standard labels and icons
- Application strategy

Five Colors

Each has a specific meaning...

- Red = “out of service”
- White = “here I am”
- Blue = “service action allowed”
- Yellow = “service action required”
- Green = “normal”

Six States or Behaviors

Each with specific ON/OFF timing...

- Off
- Steady On
- Standby Blink (repeating 150 ms ON followed by 1850 ms OFF)
- Slow Blink (1 Hz)
- Normal Blink (3 Hz)
- Feedback Flash (ON with brief periods of OFF commensurate with activity)

Consistent Spacing

Based on industry standards...

- Top indicator position is relative to the board mounting hole location specified in current VITA standards
- Distance between indicators is based on common industry spacing of 0.200 inch or 5.08 mm

Placement Order

Facilitates check reading across multiple boards...

- Order from top: red, white, (space), blue, yellow, green
- Order from left: red, white, (space), blue, yellow, green

Luminance and Viewing Angle

To ensure indicator effectiveness...

- Minimum and maximum luminance specified
- 120 degree cone of visibility required to ensure off-angle usability

Labels and Icons

For consistency...

- VITA 40 uses international standard icons when appropriate
- VITA 40 uses empirical human factors icon development processes when new icons are required

Application Strategy

Decided on a product by product basis...

- Each product uses only the indicators that make sense for that product's service model
- The indicators that are used must comply with the standard color, behavior, placement, and spacing
- Red should only be used in telco-specific products

Contact Information

If you have any questions or comments...

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