AIRBUS Input 812A

Lessons Learned A350 implementation
→ HMI (Human Machine Interface) Indication Definition proposal based on A350XWB GAINs

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GAIN HMI Color / Indication scheme

History / Current as-is summary:

GAIN Supplier unique HMI (Human Machine Interface) scheme :

- The industrial design aspect is one of the key factors to distinguish to the competitor equipment
    - **Industrial design and HMI are first eye catcher for potential new customers**
        - **Industrial design of Galley / GAINs are key for first passenger impression of dedicated airline (Boarding through Galley aisle)**
    - **Each supplier covers the need of their key customer (flight attendant operation)**

- Some examples of GAIN design on civil aviation market.
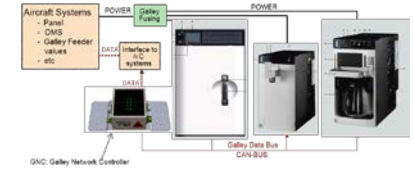
Issue explanation:

1. The system behavior (e.g. Unit failure [diag. failure message], waiting for power, Secondary GAIN) has fundamental impact on Equipment operation and therefore Flight Attendant handling.

2. Due to ARINC812A systems, the GAINS are converted from STAND-ALONE to System Equipment. This means that the competitor equipment might have/has „direct" impact on own equipment.

3. The system scheme should be aligned and is expected by the Airlines (customers).

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GAIN Supplier unique HMI (Human Machine Interface) scheme :

- A fundamental „new" icon shall be introduced – „NO NETWORK" ICON
- Proposal is to illustrate a „Crossed out PC Network System)

Example is shown above

The following major features shall be standardized:

Based on current ARINC812A given different stages and DIAG-Messages the 3 fundamental colors shall be given:
**GREEN, BLUE and AMBER**

It is proposed to illuminate the I/O (On/Off) button itself of an indication light close to it according to the following rough definition:
(detailed definition is given on the next page 4)

a. **BLUE** = Standby OFF
b. **GREEN** = Equipment Operational (e.g. Standby on)
c. **AMBER** = FAILURE

No Network LED shall be given and shall illuminate if **equipment is a Secondary GAIN in Fallback Power Control Mode (in all states including "Error")**

A temporary or even permanent failure shall be illustrated by using the AMBER color. Especially NO-Water and Equipment Error shall be indicated accordantly.
-- eye catcher for the operator.

To distinguish to Equipment failure and no-operation in case of not-granted power by the MGCU (in A350XWB it is called GNC), the I/O button shall blink / flash (GREEN)
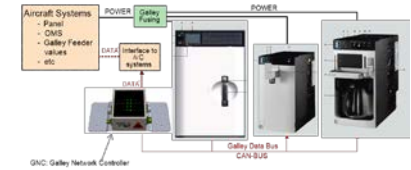
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GAIN Supplier unique HMI (Human Machine Interface) scheme :

- Following fundamental scheme shall be applicable independent on PR/SEC and Power Control Mode

❑ Blue shall be used in state "Standby OFF" only

❑ Green shall be used in state
  - i. Standby ON
  - ii. Finished
  - iii. ON
  - iv. Stopped Aborted

❑ *Green "blinking"* shall be used in state
  - i. Interrupted
  - ii. Waiting
  - iii. "no Water/low Water" (it is not an ARINC state but a condition where the GAIN is waiting to be operational)

- In order to avoid a "roller coaster" scheme effect it is recommended to imbed a delay time 3 seconds for the "Green blinking" indication.

❑ Amber shall be used in state
  - i. Error

❑ Amber *"blinking"* shall be used in state
  - i. Aircraft Maintenance e.g. Maintenance Disinfection

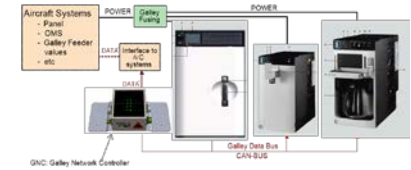- The *blinking* indication should be at a frequency of 0.5 – 1Hz

As on of the key features of the ARINC812A network is BITE, Network Monitoring and Inventory, the ERROR indication shall be the dominate visual effect.
NFF (non-failure found) events of equipment shall significantly be reduced with ARINC812A, therefore Power Management indications will have second priority.

Maintenance set via pin programming ("Workshop mode") is not covered by the above written proposal, but should be in own responsibility of dedicated Supplier.

The "No Network" shall be illuminated Amber if: (is only applicable if the equipment detects a network address attempt)
  - i. Secondary GAIN in Fallback Power Control Mode
  - ii. A incorrect (parity) PIN Programming is detected in addition to the indication Error

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Thank you

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