Alternative Equipment Replacement (NUMAC)

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Jonathan Atkinson – Simulator Hardware Engineer implemented this solution. Please contact him with specific questions.

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NUMACs are BWR instrumentation for displaying radiation, temperature, neutron monitoring. Simulator replacements are custom built at a high cost. Hardware engineer identified a economical solution that retained the hardware but used ThunderView.

Considered using ThunderView to replace entire unit as a softpanel.
What was needed for the substitution

1. Replicate the display.
2. Interface to the membrane pushbutton.
3. Operate a buzzer.
4. Interface to the simulator.
Required Equipment and Software

Existing front plate with membrane keys and buzzer.
Computer
Monitor
ThunderView drawing for the display
PoLabs PoKeys57U USB I/O Interface (~$50)
PoKeys and PoBlocks Configuration software (included with hardware)
AutoHotKey software (Open Source)
PoLabs PoKeys57U USB I/O Interface

Interfaces the NUMAC membrane keys to a USB input.
1. Remove internals from NUMAC except for buzzer.
2. Connect the keys to the USB I/O.
3. Use PoKeys to assign values to the keys. For example assign softkeys to values A, B, C, D and the arrow keys.
4. Use PoBlocks to create a logic to drive the buzzer.
5. Use AutoHotKey to move the cursor in the ThunderView drawing and click to replicate the response.
6. Install in the assembly and install in panel.
7. Interface the computer running ThunderView to the simulator network.
Software Configuration – Drive Buzzer

Value 12
A
Value 13
B
Value 14
C
Value 15
D

OR 1
A
OR
B

100 ms
PT ET
Pulse timer

IN Q

Output 1
Digital output

Value 23
Down
Value 24
Up
Value 25
Right
Value 26
Left

OR 2
A
OR
B
C
D
Feel free to contact Jonathan with any questions. I have a more detailed description available.