Inputs of U13ABD, U14ABD are normally LOW
Outputs of U13ABD, U14ABD are normally HIGH
Output of U15 is normally LOW

Inputs of U16, U17, U18, U19, U20, U21, U22, U23 are normally HIGH
Outputs of U16, U17, U18, U19, U20, U21, U22, U23 are normally LOW
Outputs of U24AC, U25AC are normally HIGH
Outputs of U24BD, U25BD are normally LOW

All inputs of U1...U12 are normally LOW. SN74159N (4-to-16-line demultiplexor/decoder) decodes the 4-bin binary number on its inputs ABCD into TTL-LOW on one of its inverting open-collector outputs 0...15.

Normally, output "0" (pin 1) is LOW, and all other are HIGH. Wiring together outputs corresponding to numbers with the same number of 0s and 1s in their binary representation plays the role of "OR". As a result, we have 5 wires coming from each SN74159: the first (top) one is normally LOW and corresponds no 0 out of 4 possible trouble signals for the bar box. The other four wires are normally HIGH, and correspond to 1, 2, 3 and 4 out of 4 possible trouble signals.

J1-2: not connected
J1-4: power presence check
J1-6: broken cable input
J1-8,-10: uninsantic water sensor

Water leak input

Humidity input

Signal map:

J2-2: Humidity in bar box #0
...
J2-24: Humidity in bar box #11

J1-2: Water in bar box #0 (primary)
...
J1-24: Water in bar box #11 (primary)

J1-26: Water in bar boxes ##0, 1, 2 (secondary)
J1-28: Water in bar box #3 (secondary)
J1-30: Water in bar box #4 (secondary)
J1-32: Water in bar box #5 (secondary)
J1-34: Water in bar box #6 (secondary)
J1-36: Water in bar box #7 (secondary)
J1-38: Water in bar box #8 (secondary)
J1-40: Water in bar boxes ##9, 10, 11 (secondary)

J3-8: Ultrasonic water sensor for bar boxes ## 0, 1, 2, 3, 4, 5
J3-10: Ultrasonic water sensor for bar boxes ## 6, 7, 8, 9, 10, 11

This card receives 36 inputs. 35 of them are TTL logic inputs driven by DM74S140 (or SN74S140), which is a dual 4-NAND Schottky TTL gate capable of driving a 50-ohm load (60 mA at TTL-Low and 40 mA at TTL-High).

These 35 inputs are normally in the TTL-Low state. If lower to 74S140s gets lost, their outputs are in the low-impedance state, i.e. seen as TTL-Low from this card.

The 36th input (J3-4), which is normally at +5V, indicates presence of power in rack #5. This input is simply delivering VCC from that rack to this card. It would probably be a good idea not to just monitor presence of VCC on this output, but also to compare it against VCC on Rack #38 (this card). This will be done on another card on the same bus with this card.

Title: BATMAN-1: The Big And Terrible MAINlogic board for the DIRC safety system, part 1		
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