1. Chiller 1 OR Chiller OR both Fault -

OR Logic for all these signals

* CHI\_outletHighWaterTemp (45312) = high water temp alarm
* CHI\_outletWaterTempSensFail (45314) = outflow water temp sensor failed
* CHI\_returnWaterTempSensFail (45316) = return water temp sensor failed
* CHI\_heatingFail (45323) = water heater not working
* CHI\_highOutletPressAlarm (45360) = high water pressure alarm
* CHI\_heatingFaultLock (45378) = heating fault locked

Logic: If: any of the signals above is true (Value = 1)

Then: Input to Node controller – Cube Chiller Fault Active (Only alarm in DAS)

Input Register for Node controller – 6112

1. Chiller 1 OR Chiller 2 Failure

OR Logic for all these signals

* CHI\_outletLowWaterTemp (45313) = low water temperatue on chiller outlet
* CHI\_pumpFail (45329) = pump fault
* CHI\_inverterComFail (4533 = variable speed drive comms not working
* CHI\_highSystemPressAlarm (45340) = high system pressure alarm
* CHI\_sysHighVoltageLock (45367) = high voltage alarm
* CHI\_sysLowVoltageLock (45368) = low voltage alarm
* CHI\_exhaustGasHighTempLock (45369) = high temperature alarm of refrigerant gas
* CHI\_inverterOverCurrentLock (45370) = over current alarm
* CHI\_inverterOverTempLock (45371) = variable speed drive (VSD) high temperature alarm
* CHI\_inverterOverVoltLock (45372)= VSD over voltage alarm
* CHI\_inverterUnterVoltLock (45373) = VSD low voltage alarm
* CHI\_inverterPhaseLossLock (45374) = VDS phase fault
* CHI\_inverterOtherFaultLock (45375) = VSD other fault

Logic: If: any of the signals above is true (Value = 1)

Then: Input to the Node Controller – Chiller Failure Active (Node controller will trip the Node)

Input Register for Node controller *–* 6106

1. Pressure drop in Chiller 1 or Chiller 2

* If: Inlet water pressure (40974) – Outlet Water pressure (40975) < 0.06 bar

Then: Input to Node controller – Cube Chiller pressure drop Active (Alarm in DAS)

Input register for Node controller: 6118

1. Excessive Cube Internal temperature
   1. Temp Sensor 1, Temp sensor 2 and Temp sensor 3-point details from DAS.

Graphical user interface, application

Description automatically generated

Graphical user interface, application

Description automatically generated

Graphical user interface, text, application

Description automatically generated

Logic – *If:* avg of Temp Sensor 1, 2 and 3 > 40Deg C for more than 2 hrs.

*Then*: Input to Node controller – Node High temperature active (Node controller will trip the node)

Input register for Node controller: 6124

1. Power Outage in the Cube:

UPS to Banana-pi is USB communication

UPS battery charge – Signal details

Graphical user interface, application

Description automatically generated

Logic – If: Cube UPS battery charge < 20%

Then: Input to Node controller – Cube power outage (Node shut down)

Input register for Node Controller: 6168

1. Excessive Humidity in the Cube

A screenshot of a computer

Description automatically generated with medium confidence

Logic- *If:* Humidity is > 95% for more than 2 hrs.

*Then*: Alarm in DAS – Excessive Cube Humidity

Register in DAS:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DL10 Humidity | NUMERIC | INPUT\_REGISTER | TWO\_BYTE\_INT\_SIGNED | 5 | 0 |
| DL10 Temp sensor in °C | NUMERIC | INPUT\_REGISTER | TWO\_BYTE\_INT\_SIGNED | 5 | 1 |
| DL10 Temp sensor in °F | NUMERIC | INPUT\_REGISTER | TWO\_BYTE\_INT\_SIGNED | 5 | 2 |