

AN01 - Creating an Alarm on Power/LIT Failure

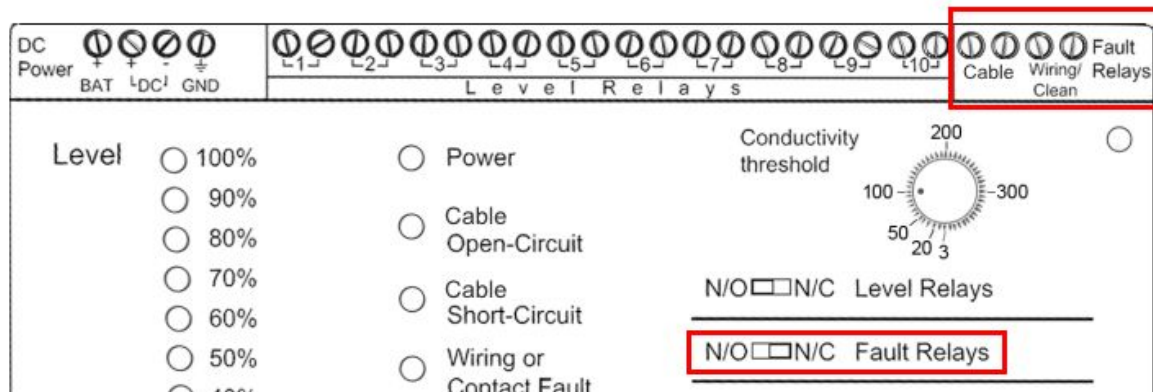
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The LIT is very reliable but everything electronic ultimately fails, even if it takes 30 years.

We designed the LIT so that a simple test can give you an external alarm for LIT power fail or LIT failure - by setting the two fault relays to normally closed (“N/C”).

The Setup

The LIT has two fault relays, located to the right of the 10 level relays:



Set the second DIP switch, “Fault relays” to N/C, which means “normally closed”.

Now these fault relays will be closed with no faults and will open to indicate fault conditions.

Relay 11 - “Cable”¹ - will be closed when the cable is ok (the LIT tests cable integrity in the Fogrod). Relay 12 will be closed when there is no wiring or contact fault and no “Clean Fogrod” alarm. It will be extremely rare to have both a cable fault and a “Clean Fogrod” or wiring fault at the same time.

However, it is the LIT power and software that holds these relay contacts closed. If you set that DIP switch to N/C and remove power from the LIT then both relays spring open. (You can test this easily yourself if you have an LIT).

If You Have Telemetry/SCADA

If you have a telemetry or SCADA system then the ideal is to wire relay 11 (Cable fault) into one telemetry input, relay 12 (Wiring/Clean fault) into another telemetry input and simply configure each input to be a normally closed fault. Every type of telemetry system is configured differently so you need to ask your telemetry person to do this. It is often as simple as a check box in the configuration interface.

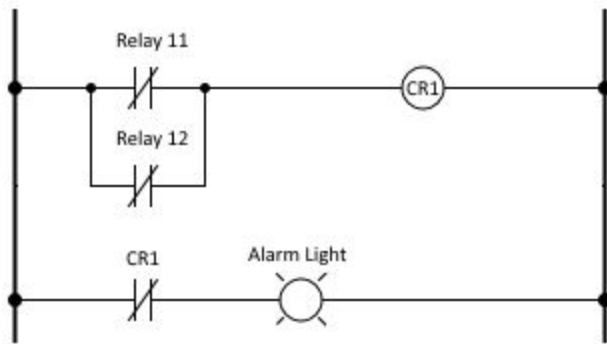
Then also ask them to setup an **additional alarm created from logic** so that when **both** fault inputs go open this creates an “LIT or power fail alarm”.

¹ For LITs shipped before 2015 this fault was labeled “Failsafe”, in 2015 we changed the name to “Cable”

If You Don't Have Telemetry/SCADA

This example only shows an external alarm (e.g. alarm light on top of panel) in the case of loss of power/failure of LIT. The example doesn't make use of the individual fault conditions.

You wire the relays in parallel to an external relay which has a normally closed output and use that output with an alarm light (or an alarm light with that feature):



So if both relay 11 and relay 12 open then the control relay (CR1) will turn off, which makes the alarm light come on. If either relay 11 or 12 are closed (no fault) then the alarm light will be off.

General Note

This idea is commonly used in process plants. Faults are the exception. Of course, we've all seen cases where some faults are on most of the time. But if you have most of your faults active most of the time the plant is impossible to run, and actually will be very dangerous.

Suppose you have a PLC card with 8 relays corresponding to 8 faults. Under normal conditions all 8 faults will be inactive.

We could set the relays in the PLC card to be N/O (normally open) and with no faults, all 8 relays will be open.

But what if the PLC card itself has failed? We might actually have a serious fault and we won't know it.

Instead we can set the relays in the PLC card to be N/C (normally closed). With no faults, all 8 relays will be closed. When one relay opens it indicates one fault.

Now if the PLC card fails, all the relays will spring open - because the relays are held closed by power to the card, and software from the PLC.

So if we see that all relays are open, i.e. all 8 faults are active, then we know that something bad has happened. Either we are very unlucky with 8 faults occurring together, or - more likely - the PLC card has failed. At least we get a warning that we probably have a failure of our monitoring and control equipment. This is the idea behind configuring faults as normally closed.

About Wastewater Level and the Fogrod

Wastewater Level LLC manufactures the Fogrod and LIT. We offer free trials to municipal organizations. Visit our website: wastewater-level.com for more about our products.