



DynAmp

# Technical Bulletin

***NO. 120131***

**TOPIC: HOW TO CONVERT LKAT ALARM RELAY  
CONTACTS TO NON-FAILSAFE OPERATION**

# INTRODUCTION

This document is intended to :

- provide a brief overview of the alarm functions of the LKAT Plus system
- define the word “failsafe” as it applies to the LKAT Plus alarm relay contacts
- provide a method to change the LKAT Plus alarm relay contact action to non-failsafe configuration

## OVERVIEW

The LKAT Plus system includes two separate alarm relays each with associated LED indicators.

The Accuracy Diagnostics “AD” alarm monitors the operation of the LKAT Plus system hardware. The AD alarm relay contacts and LEDs indicate whether or not the LKAT Plus System is operating properly. The conditions that result in an AD alarm include:

- Power supply malfunction in the Metering Unit electronics
- Measuring head halves disconnected from the Metering Unit
- Measuring head signal imbalance
- Measuring head malfunction
- Loss of input power (only when configured as “failsafe”)
- Other problems

The Trip1 alarm and LEDs indicate either reverse current trip or forward current trip. The Trip1 setpoint range is from  $\pm 5\%$  to  $\pm 100\%$  of the full-scale current measurement range of LKAT Plus system. The alarm occurs when the measured current exceeds the setpoint (positive or negative). The trip timing is nearly instantaneous. In the failsafe configuration, an alarm also occurs upon loss of input power.

For reverse trip configuration, the Trip1 setpoint is usually relatively low. A typical reverse trip setpoint is -5% of full scale. When configured for forward current, the Trip1 setpoint is usually close to, or equal to 100% full scale.

The optional Protection Extensions “PE” pc board assembly may be included as a daughterboard in the LKAT Plus metering unit. The PE option adds Trip2 and Trip3 which are identical in function to Trip1.

## THE TERM “FAILSAFE”

The LKAT Plus System is failsafe as normally configured. When the system is energized, all relay coils are energized and all contacts change state; that is, open contacts close and closed contacts open. During any alarm condition, relay coils de-energize, which changes the state of the relay contacts.

In the failsafe configuration, loss of input power to the LKAT Plus Metering Unit de-energizes the alarm relay coils. This causes the relay contacts to change state and indicate an alarm condition.

## NON-FAILSAFE CONFIGURATION

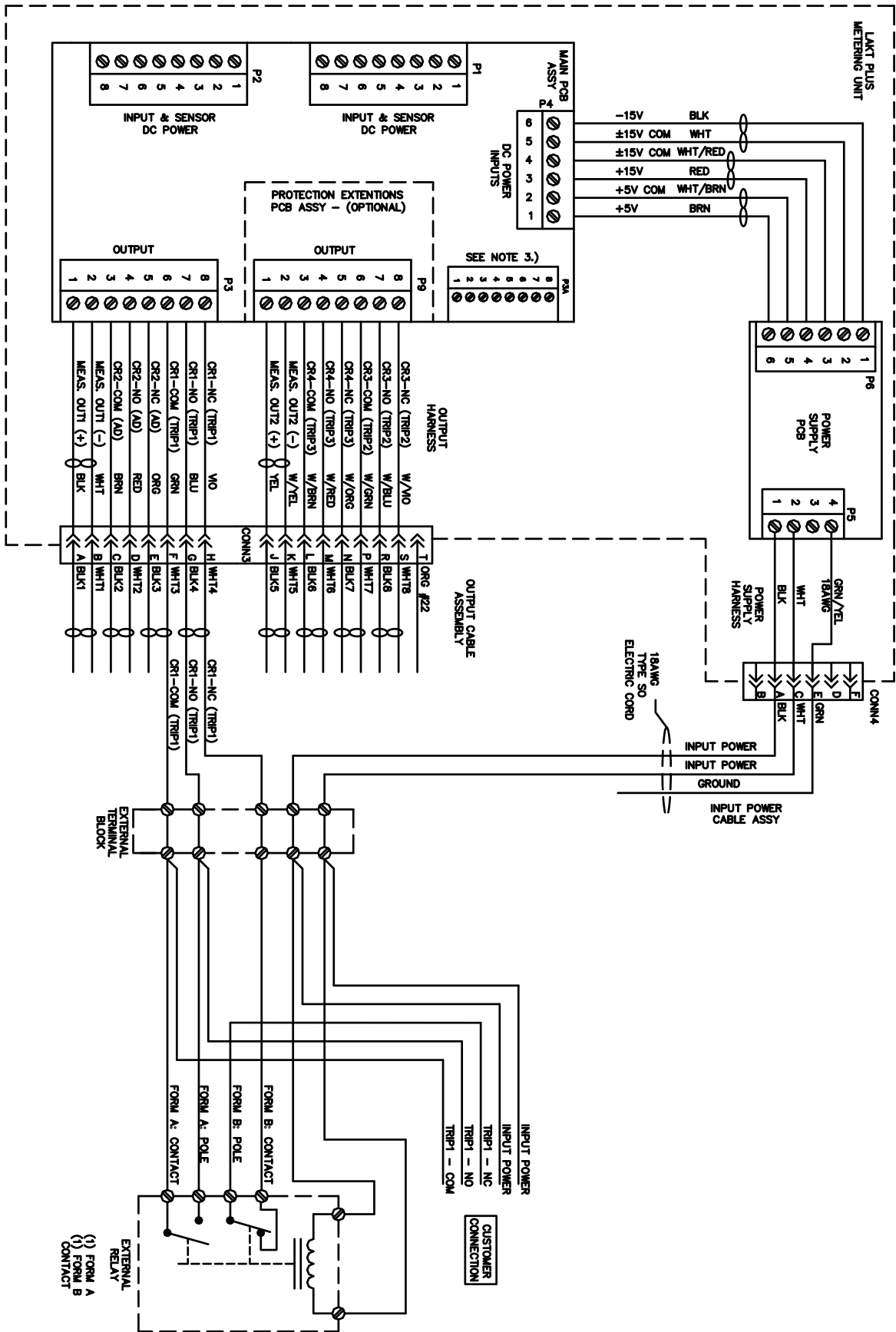
For some applications, the user requires the alarms to be “non-failsafe”. That is, the system should not produce an alarm when there is loss of input power. Alarm conditions other than loss of input power must continue to result in an alarm.

To convert the LKAT Plus System to non-failsafe operation requires external relay(s). Each alarm relay requires its own dedicated external relay to be made non-failsafe.

The figures below include electrical schematics and a typical wiring diagram. These drawings show how to add the external relay needed for non-failsafe operation.

Note:

1. All relay contacts are shown with the LKAT Plus System in the de-energized state.
2. The mains input power connected to the LKAT Plus System is used to energize the external relay. Therefore, the external relay coil voltage must be compatible with LKAT Plus input power voltage.
3. External relay contact current and voltage ratings must be greater than or equal to LKAT Plus contact ratings.
4. External relay delay time should be close to LKAT Plus relay delay time ( $\pm 5\text{mSEC}$ ).
5. Observe proper polarity for external relay coil connection (if applicable).
6. The same external relay configuration is duplicated for AD alarm, Trip1, Trip2 and Trip3 on optional PE pc board.
7. There is no delay time added to LKAT Plus alarms when the external relay is added.



## Wiring / Interconnection for Non-Failsafe Relay Function

## LKAT ALARM RELAY SPECIFICATIONS

<b>Coil Type</b>	Non Latching
<b>Contact Form</b>	DPST-NO/NC (1 Form A and B)
<b>Contact Rating (Current)</b>	8A
<b>Switching Voltage</b>	250VAC, 125VDC - Max
<b>Contact Material</b>	Silver Nickel (AgNi)
<b>Operate Time</b>	10ms
<b>Release Time</b>	8ms
<b>Operating Temperature</b>	-40°C ~ 65°C