CAUTION

Do not connect inputs across an inductive device. Doing so may damage the circuit.

The LTB provides eight sets of input terminals for 24 – 240 V ac or dc input signals. The input signals are converted to 24 V dc logic signals for use by the drive control board. Note that ac input signals cannot be used on the G2 version LTBs. See Table 1.

The LTB control outputs consist of seven low voltage, low current, form C relay contact connectors, OT1 – OT7, with three terminals each. Also, pilot contact connections function to actuate the seven high voltage, high current relays, such as on the 531X191RTB (RTB) or DS200RTBA (RTBA) relay terminal boards. See Table 2.

NOTE

When the LTB and RTBA are used together, relay contacts from both boards are available.

APPLICATION DATA

CONNECTOR TYPES

The LTB contains two types of connectors: plug-in connectors for ribbon cables and terminal board connectors for individual wires.

- Plug-in connectors, identified by *PL* in its name, carry signal and power I/O within the control device.
- Terminal board connectors, identified by *TB* in its name, provide connections for wires from both internal and external devices.
- See Tables 1 – 6 for definitions of all connections.

INPUT SPECIFICATIONS

Input voltage and current specifications for terminals IN1 – IN8 are as follows:

Nominal Voltage Range	Current Range
24 – 230 V ac, 60 Hz (G1)	4 – 10 mA peak
115 – 230 V ac, 50 Hz (G1)	4 – 10 mA peak
24 – 250 V dc (G1 and G2)	4 – 8 mA

ON heat dissipation per terminal point is as follows:

Input Voltage	Heat Dissipation
24 V	0.2 watt
115 V	0.9 watt
230 V	1.8 watt

Revision 531X307LTBAGG1 and later have the following ON/OFF specifications:

- Turn-On Threshold: 9 V, 4.6 mA ac/dc peak
- Turn-Off Threshold: 6 V, 1.0 mA ac/dc peak

NOTE

Devices connected in series with an input that has a dc leakage current greater than 1.0 mA or ac peak leakage current greater than 4.0 mA can cause the input to be continuously in the ON state.

All other revision LTBs have the following ON/OFF specifications:

- Turn-On Threshold: 6 V, 0.5 mA ac/dc peak
- Turn-Off Threshold: 6 V, 0.5 mA ac/dc peak

NOTE

Devices connected in series with an input that has an ac/dc leakage current greater than 0.5 mA can cause the input to be continuously in the ON state.

OUTPUT SPECIFICATIONS

Output voltage and current specifications for the relay outputs (form C contacts, non-fused) at terminal points OT1 – OT7 are as follows:

Voltage	Current
125 V ac	0.6 A
110 V dc	0.6 A
30 V dc	2.0 A

RTB and RTBA pilot outputs are form A contacts.

I/O TERMINAL WIRING

All I/O terminal wire must be size 28 – 14 AWG.

- The maximum length of a 26-conductor ribbon cable is 20 feet.
- The maximum length of input and output wiring depends on the application.

NOTE

Do not route I/O ribbon cables with power cables. In ac applications, capacitive coupling of connection wires can cause I/O input (IN1 – IN8) leakage.

LED INDICATORS

The LTB provides 15 LED indicators that function as follows:

Indicator	Description
LED1 – LED8	ON when the source is applied to circuits IN1 – IN8, respectively
LED17 – LED23	ON when relays RX1 – RX7 are energized, respectively

I/O CONNECTOR TABLES

The LTB connects to the drive control board via connector 8PL (G1 only), to the LAN control board or drive/LAN control board via connector 10PL, to the NTB/3TB terminal board via connector OPTPL, and to the RTB or RTBA relay terminal boards via connector RPL.

Tables 3 – 6 list the I/O pin signals of the different connectors on the LTB. These tables are organized as follows:

- **Table 3** – 8PL, I/O between the NTB/3TB terminal board (NTB), the drive control board (SDCC or LDCC), and LTB
- **Table 4** – 10PL, I/O between the LAN control board or drive/LAN control board (SLCC or LDCC) and LTB
- **Table 5** – OPTPL, I/O between the NTB/3TB terminal board (NTB) and LTB
- **Table 6** – RPL, I/O between the relay terminal board (RTB or RTBA) and LTB

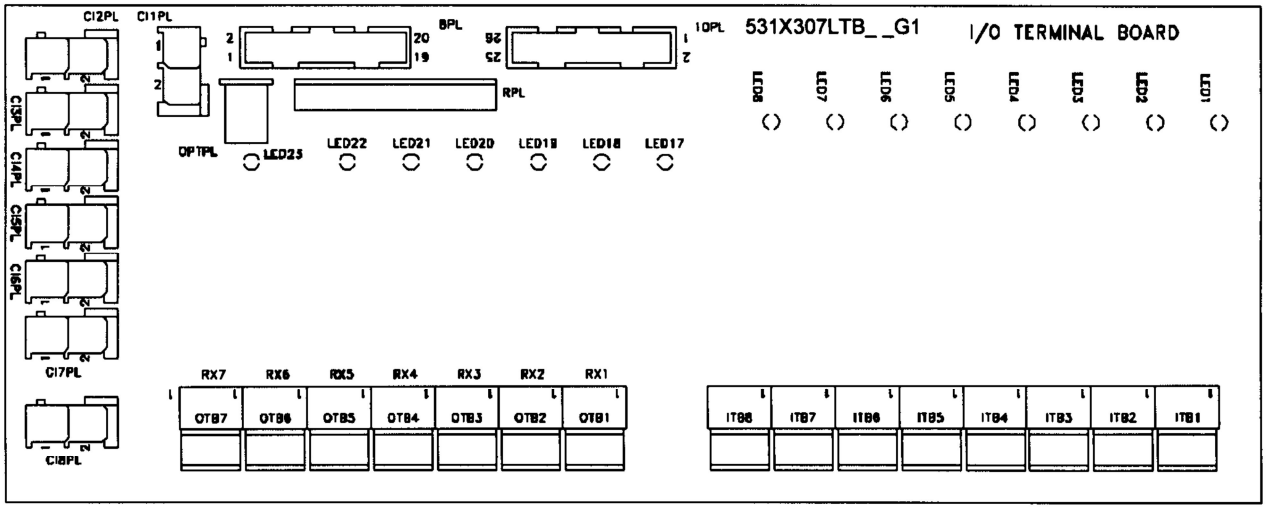

Figure 1. LTB Board Layout Diagram

Table 4. Connector 10PL,
I/O Between LTB and LAN Control Board or Drive/LAN Control Board (SLCC or LDCC)

Pin No.	Nomenclature	Description
1	P24	+24 V dc
2 – 8	1I2 – 1I8	±24 V logic lines to the drive
9 – 16	——	Not Connected
17	N24	–24 V dc
18	1I1	±24 V logic lines to the drive
19 – 25	1O1 – 1O7	Relay control lines 0 – 6
26	P24	+24 V dc

Table 5. Connector OPTPL,
I/O Between LTB and NTB/3TB Board

Pin No.	Nomenclature	Description
1	X2	Return for CFX1 120 V ac loads (isolated from COM) – Same as NTB/3TB pin 85.
2	CFX1	120 V ac, ±15%, from NTB/3TB board, fused at 500 mA, including internal fans (isolated from COM) – Same as NTB/3TB pin 83.

Table 6. Connector RPL,
I/O Between LTB and Relay Terminal Board (RTB or RTBA)

Pin No.	Nomenclature	Description
1	115 V	115 V ac RTBA relay common
2	——	Not Connected
3	RX1	RTBA relay K6 pilot output 0
4	——	Not Connected
5	RX2	RTBA relay K7 pilot output 1
6	——	Not Connected
7	RX3	RTBA relay K8 pilot output 2
8	——	Not Connected
9	RX4	RTBA relay K9 pilot output 3
10	——	Not Connected
11	RX5	RTBA relay K10 pilot output 4
12	——	Not Connected
13	RX6	RTBA relay K11 pilot output 5
14	——	Not Connected
15	RX7	RTBA relay K12 pilot output 6
16	——	Not Connected