Series 2040 Test Systems

Loadbox Control System

Part Number 4200-0212
Version 1.1

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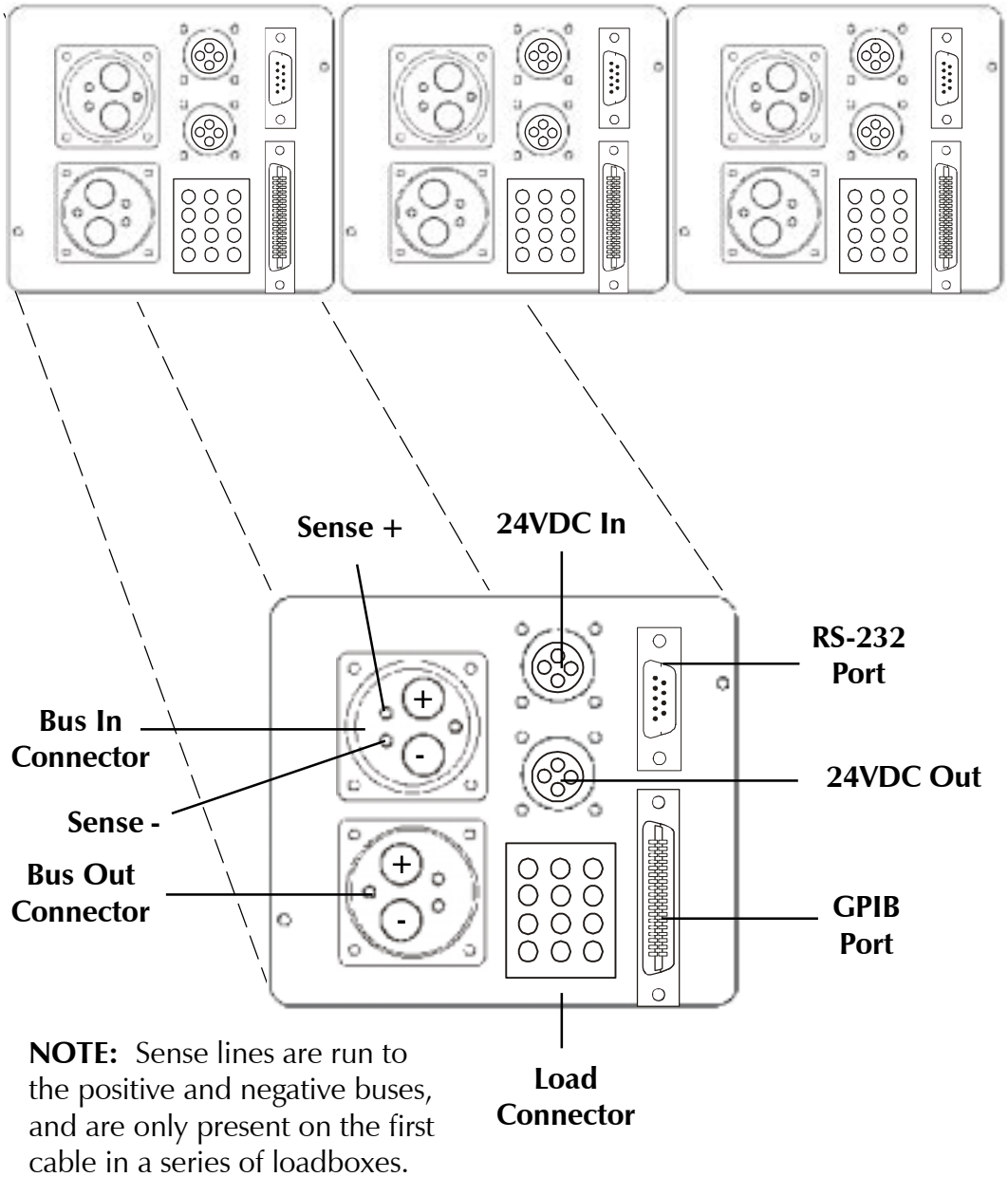
Loadbox Control System

Connector Assemblies



NOTE: Sense lines are run to the positive and negative buses, and are only present on the first cable in a series of loadboxes.

Loadbox Control System

The Loadbox Control System (LCS) is a generic interface, consisting of one or more loadbox assemblies, between the Series 2040 Test System and the DUT(s). The block diagram on the left page shows a typical installation of three loadbox assemblies on a standard 19" rackmount. The LCS can be used to apply pull-up resistors, pull-down resistors, capacitance, inductance, or many other application-specific signals.

Controller Board

The heart of the system is the 36 Channel GPIB Relay Controller Board. This board contains twelve, 24-Pin ribbon cables connected to twelve separate load module units. Each load module unit contains power and control signals for three separate channels (or relays). In turn, each of these channels is capable of switching in signals common (+Bus In, -Bus In) to all twelve load modules or totally independent signals for the DUT(s). The output from each load module unit is run routed to the load connector for easy connection to the DUT(s).

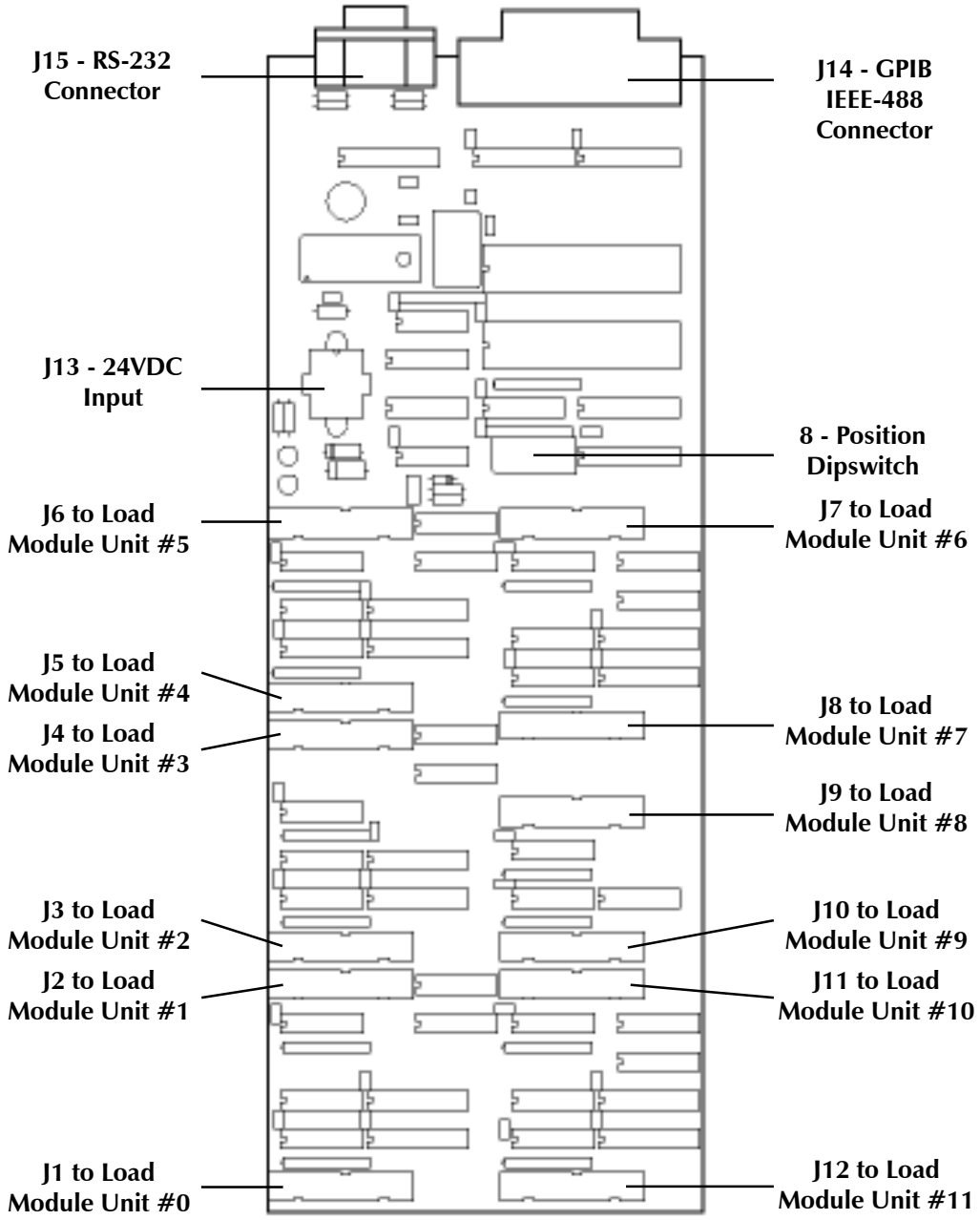
The communication interface for the Loadbox Control System is an IEEE488/ GPIB bus from the Series 2040 Computer at connector J14 (Refer to page 4). Each loadbox assembly is assigned a unique GPIB device number using the DIP switch on the controller board. These device numbers are assigned when the entire LCS is assembled and installed. In addition, the board contains a RS-232 DB9 interface connector at J15 for future use.

Each controller board is powered by an external 24VDC Power Supply via connector J13. An on-board DC-DC converter is used to provide the +5VDC required by the logic.

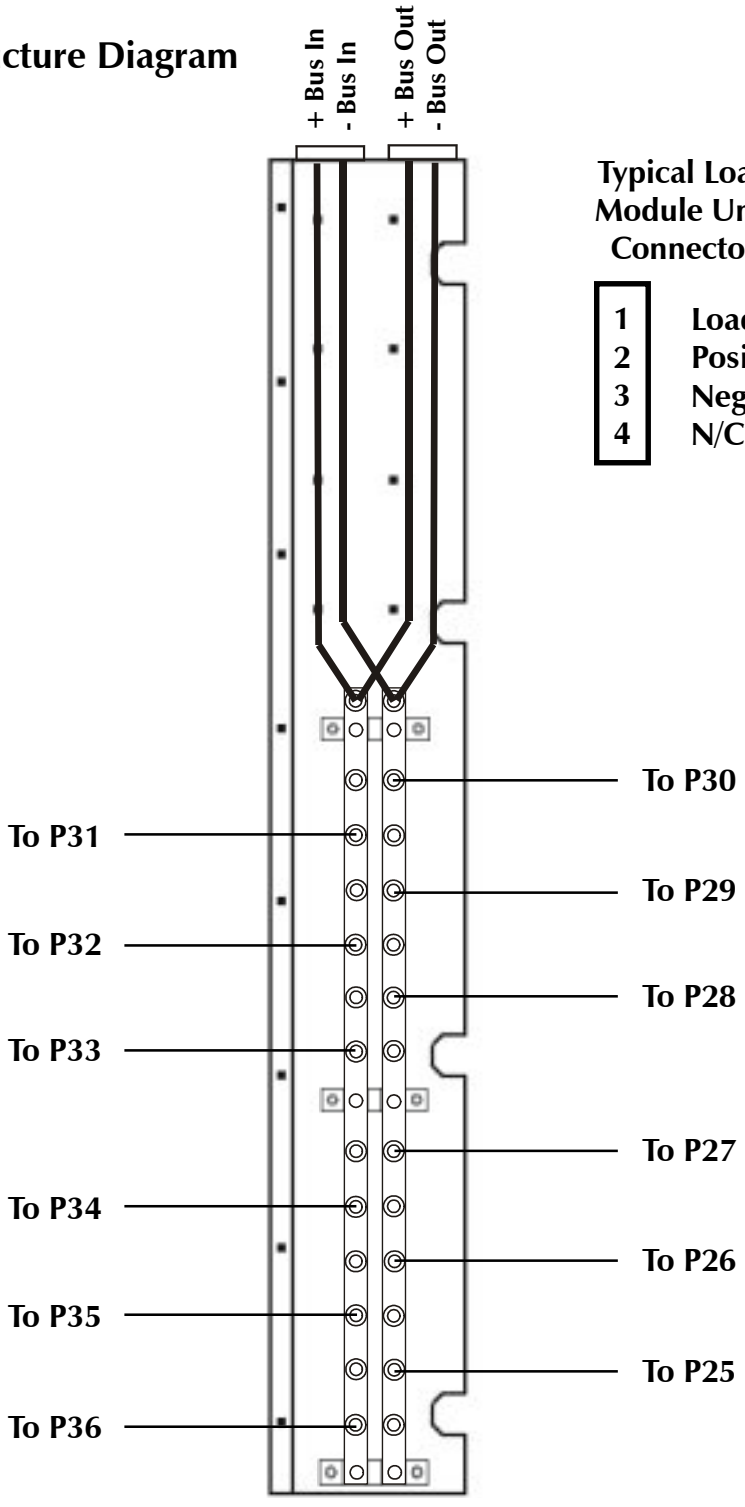
Bus Structure

The loadbox assembly utilizes a voltage bus and a ground bus to provide pull-up and pull-down levels for the load resistors. Sense lines are used to monitor the voltage on the first loadbox in a series of loadboxes. Although the load module unit is primarily intended for high-current, low-resistance precision resistors, almost any resistance may be used for the load resistors on each load module. In addition to resistive loads, capacitance, inductance, or other types of electronics may be substituted to meet the requirements of the specific application(s).

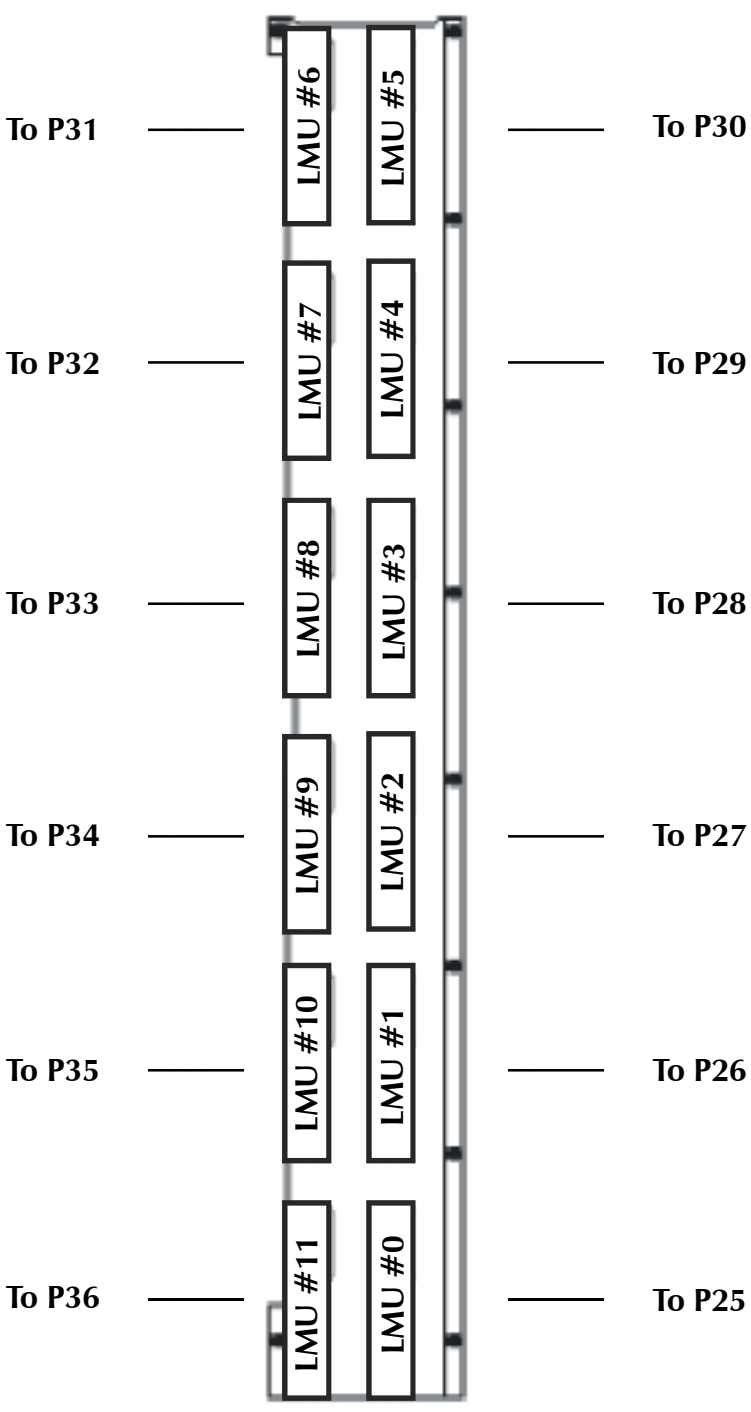
36 Channel GPIB Relay Controller Board PN #0003-0626



Bus Structure Diagram



Load Module Unit Placement



Controller Board Command String Set

These command strings control the operation of the controller board via the GPIB commands ibwrt and ibrd (except for ibclr).

AL Open all relay channels on all load module units.
* Return string: (None)

Cxx Close/energize relay channel xx on corresponding Load Module Unit (where x = 00 to 23 in hexadecimal; 3 relay channels per Load Module Unit).
* Return string: (None)

ibclr

Standard GPIB command which effects the same results as the "AL" command string.

***IDN?** Retrieve device ID and model number of Load Box Assembly Controller.
* Return string: Digalog LBX1

Oxx

Open/de-energize relay channel xx on corresponding Load Module Unit (where x = 00 to 23 in hexadecimal; 3 relay channels per Load Module Unit).
* Return string: (None)

Rxx

Retrieve status of relay channel xx on corresponding Load Module Unit (where x = 00 to 23 in hexadecimal; 3 relay channels per Load Module Unit).
* Return string: 00 = Non-energized relay channel
* Return string: 01 = Energized relay channel or no Load Module Unit is present.

SF Retrieve error status of previous command.
* Return string: 00 = OK
* Return string: 02 = Communication buffer overflow
* Return string: 05 = Bad command parameter

Sx Retrieve ID code of Load Module Load x (where x = 0 to B in hexadecimal).
* Return string: 00 to FE (= Type #) or FF if no Load Module Load is present

VN Retrieve version number of firmware.
* Return string: 01

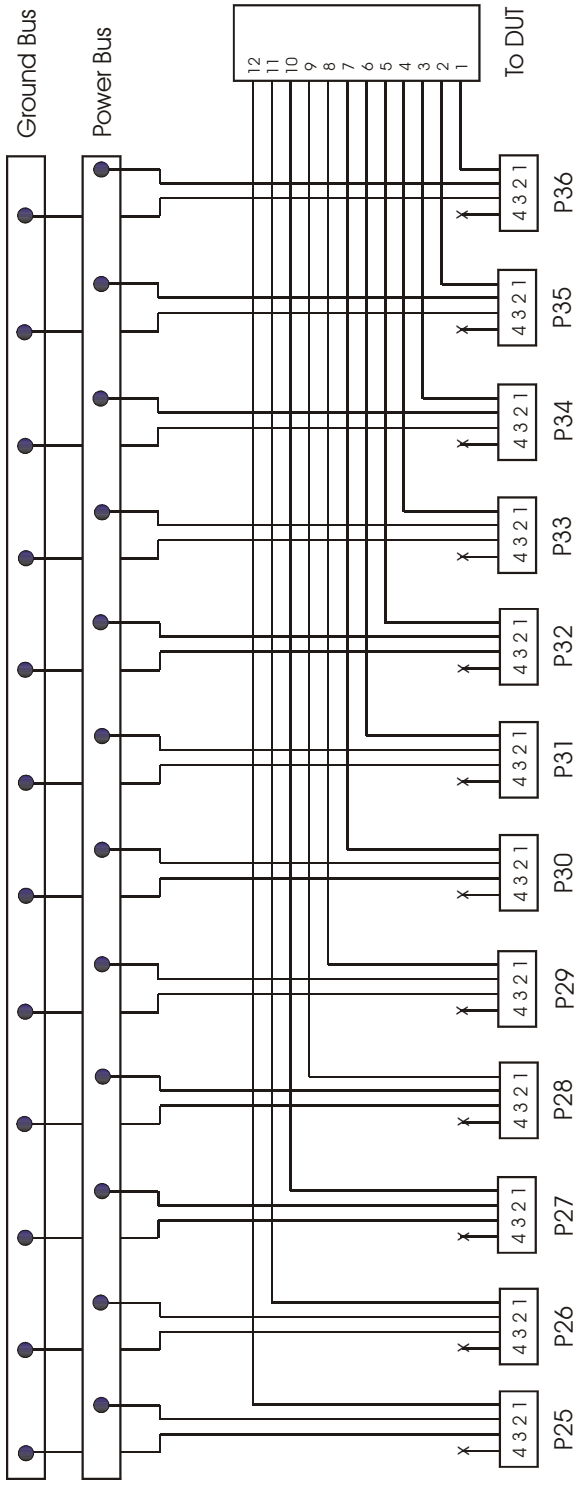
NOTE: Both upper and lower case letters are acceptable.

8 - Position Dip Switch Settings

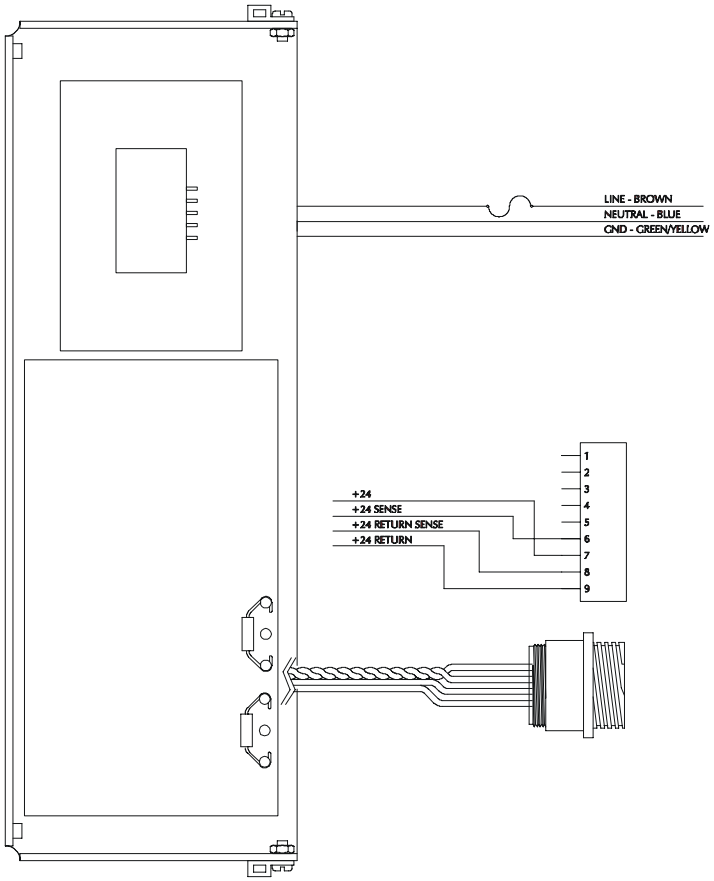
Pos #	"On" State	"Off" State
1	Normal Mode*	Selftest Mode
2	No Serial Echo*	Serial Echo
3	IEEE-488*	RS-232
4†	Logic 0	Logic 1 : GPIB Address Bit #0
5†	Logic 0	Logic 1 : GPIB Address Bit #1
6†	Logic 0	Logic 1 : GPIB Address Bit #2
7†	Logic 0	Logic 1 : GPIB Address Bit #3
8†	Logic 0	Logic 1 : GPIB Address Bit #4

* = Default Setting
† = Installation dependent

Load System Internal Wiring Harness
PN# 0000-0620



24VDC Power Supply PN# 0000-0611



Parts List

24VDC Power Supply Assembly 0000-0611
Loadbox 24VDC Internal Harness 0000-0615
Loadbox Fan Assembly 0000-0616
Load System 24VDC Jumper Cable 0000-0617
Loadbox Product Power Input Cable 0000-0618
Loadbox Product Power Output Cable 0000-0619
Loadbox Internal Wiring harness 0000-0620
Load System Bus Jumper Cable 0000-0621
24VDC P/S to Loadbox Cable 0000-0622

Software

LoadRly

The LoadRly call provides on/off control for the LoadBox Controller.

Visual Basic Declaration:

Public Sub LoadRly(ByVal GPIBAddr As Integer, ByVal Chan As integer, ByVal State As Integer)

Call LoadRly(GPIBAddr, Chan, State)

WHERE:

GPIBAddr

= 1 to 31. The GPIB address.

Chan

= 0 to 36. (First Relay, Second Relay, etc...)

State

= 0 Turn Relay off.
= 1 Turn relay on.

LoadRlyStat

The LoadRlyStat call provides status of relays from the LoadBox Controller.

Visual Basic Declaration:

Public Sub LoadRlyStat(SRet As Integer, ByVal GPIBAddr, ByVal Chan As Ingteger)

Call LoadRlyStat(SRet, GPIBAddr, Chan)

WHERE:

SRet

= Returning State of relay.

GPIBAddr

= 1 to 31. The GPIB address.

Chan

= 0 to 36. (First Relay, Second Relay, etc...)

LoadRlyId

The LoadRlyId call returns the configuration ID of a LoadBox Controller Load.

Visual Basic Declaration:

Public Sub LoadRlyID(IDRet As Integer, ByVal GPIBAddr, ByVal Load As Ingteger)

Call LoadRlyId(IDRet, GPIBAddr, Load)

WHERE:

IDRet

= Returning ID of load.

GPIBAddr

= 1 to 31. The GPIB address.

Load

= 0 to 11. (First Load, Second Load, etc...)

LoadRlyReset

The LoadRlyReset functional call opens all load relays at the specifies GPIB address.

Visual Basic Declaration:

Public Sub LoadRlyReset(ByVal GPIBAddr As Integer)

Call LoadRlyReset(GPIBAddr)

WHERE:

GPIBAddr

= 1 to 31. The GPIB address.