Labels in diagrams (repeated across three portal illustrations):

120 VAC — To the Next Portal — Home Run — Central power & communication combined. — Magnetic Lock — D.P.S. — Power Transfer Unit — Power Transfer Hinge — Electric Lockset — Entry Key Switch — Entry Access Reader — Electric Strike — Exit Reader — Exit Push Button

Where Trust is Built ™

DETEX ®

Integrated Door Security Systems

APPLICATION and TECHNICAL

SUPPORT MANUAL

101328 September 3, 2019

Quick Start Find it on page ………...

Series 800 Logic Controller

Quick Start
Use Section 1

If **. . . . . . .** statements are placed throughout this manual as an indication that there are other available options that you may wish to consider.

The Series 800 Controller provides a combination of power and functional control over devices electrically activated that are associated to access or egress at

*The **default settings** provided relate to control over basic in and out operations for devices operating on 24 volts DC and are triggered by a device with a switch.*

Use Section 1.0 for a Quick Start using Default Settings

1.0   Overview of the default settings as provided by the factory for Standard Access and Egress. As a part of this section information and instruction is included for:

   1.1   . **adding or changing input devices to the default configuration**
   1.2   . **adding or changing output devices to the default configuration**

2.0   Programming mode instruction for invoking Delayed Exit and 2-Door Operations with or without Interlock controls.

   2.1   . Relay release grant time, Remote Lockout Manual Reset, Early Relock, Fail Secure, Toggle
   2.2   . Function calls for External Led Polarity, DPS/BPS Delay
   2.3   . Delayed Exit for NFPA, BOCA, UBC, SBC, NBC (Canada)
   2.4   . 2-Door Control
   2.5   . 2-Door Interlock Control

3.0   Maximizing Input and Output device control for complex integration of external components or services.

   3.1   . Advanced time control and effects to output relays R1, R2 and R3
   3.2   . Manual Jumper Link settings for relays
   3.3   . Integration to external monitoring and control systems
   3.4   . Magnetic door holders
   3.5   . Multiple point release inputs and Control Panel integration, Door Call Module [option]
   3.6   . Retractor panic devices and the Auto-opener
   3.7   . Future
   3.8   . Future
   3.9   . Future

4.0   Power and Technical Support for infrastructure settings

   4.1   . External power sources
   4.2   . System applications for daisy chaining from a central power supply
   4.3   . Future
   4.4   . Power-up and Electrical Specifications

FACTORY DEFAULT SETTING
ACCESS OR EGRESS

STANDARD settings out of the box

RLB800 CONTROLLER Rev: 2.0
PIC Ver: 2.0   Upwards

DRW – 01
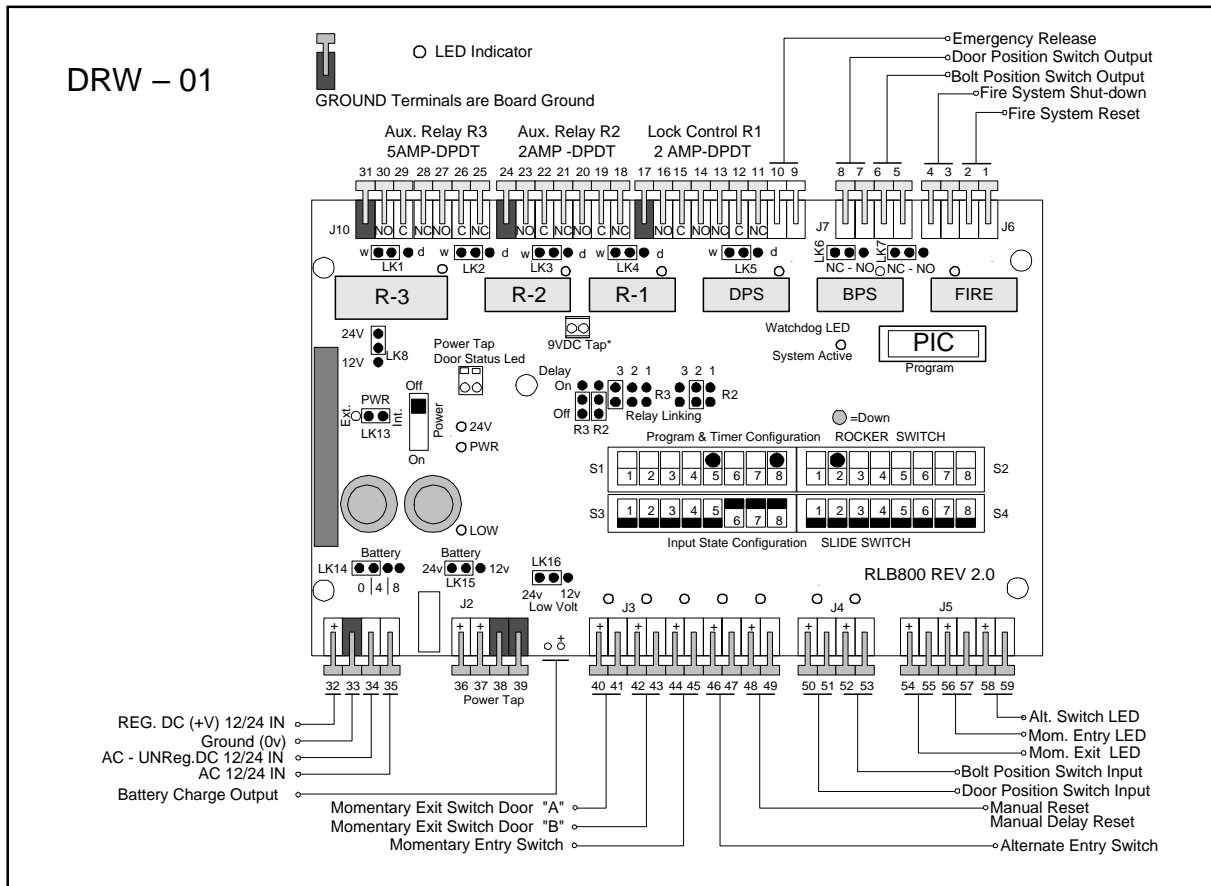
1. 0 OVERVIEW of the DEFAULT SETTINGS

1. When the controller is powered, the relays change their status from **NORMAL** to energized ACTIVE All instruction references to relay contacts are in the NORMAL state, not energized.

2. Normally closed contact switches must be connected across terminals 1/2 and 3/4 in order for the relays to energize. The default factory status is to ship with a wire jumper in place.

3. A Normally closed switch must be placed across terminals 9/10 in order to obtain lock power on relay R1. The default factory status is to ship with a wire jumper in place.

4. Programming jumper links switches are designated by LK and a number from 1 to 16.

5. Programming dipswitches are of two styles, **a rocker type** (S1 / S2) and **a slide type** (S3 / S4).

6. Default power <u>output</u> settings can be quickly switched from 24VDC to 12VDC, *Ref: Section 4.0*

Work-up Configuration Sheet

Jumper and Dipswitch Settings

Factory Default Setting — Changed to ..... — **Actual Setting (Installed)**

S1 labels (top): Delayed Egress, Remote Lockout, 2 Seconds, 4 Seconds, 8 Seconds, 16 Seconds, 32 Seconds, DPS Reset On
S1 labels (bottom): Standard Access, Remote Relock Off, Off, Off, Off, Off, Off, Manual Reset On

S2 labels (top): Early Relaock On, 45 Seconds, 2 Minutes, 8 Minutes, 20 Minutes, 30 Minutes, Toggle On, Fail Secure On
S2 labels (bottom): Early Relaock Off, Off, Off, Off, Off, Off, Alt. Entry Normal, Fail Safe

S3 labels (top): NC Contacts (×8)
S3 labels (bottom): Exit Device A, Exit Device B, Momentary Entry, Alternate Entry, Manual Reset, DPS Input, BPS Input, External Led Polarity

S4 labels (top): On (×8)
S4 labels (bottom): DPS Delay Off, BPS Delay Off, Aux.Relay 2 Special Time Options, Aux.Relay 3 Special Time Options

●=Down

The setup drawings should be copied **prior to marking**. Use the copies to make your work-up sheets. The final configuration, after hook-up is confirmed to be operational, should then be transferred to the manual and left with the installation

Local Alarm 5AMP-DPDT — 31 30 29 28 27 26 25
Remote Alarm 2AMP -DPDT — 24 23 22 21 20 19 18
Lock Control 2 AMP-DPDT — 17 16 15 14 13 12 11 10 9 — J3
DPS/BPS — 8 7 6 5
FIRE — J2 J1 — 4 3 2 1

w ●●● d LK1   w ●●● d LK2   w ●●● d LK3   w ●●● d LK4   w ●●● d LK5
LK6 NC - NO   LK7 NC - NO

R-3   R-2   R-1   DPS   BPS   FIRE

24V ● / 12V ● LK8

Ext. PWR Int. LK13
Off Power On

● 24V Led
● PWR Led

Delay
On — 3 2 1 — R3   3 2 1 — R2
Off — R3 R2
Relay Linking

LK14 ●●● / 0 4 8   Battery 24v ●● 12v LK15   Battery
LK16 ●●● / 24v 12v Low Volt

Default positions are illustrated ●● as

Indicate new settings by filling in a new block ▉

RLB800 REV 2.0

Jumper Settings

SERIES 800 INTEGRATED SYSTEMS –make copy of this drawing before marking   5

Work-up Configuration Sheet

INPUT TERMINATIONS and POWER

Remote Power Supply VDC
Ref: Spec.

12VAC → 24VAC
T-12VAC   T-24VAC
Hot 120VAC
Neutral

Not to Exceed 28VAC
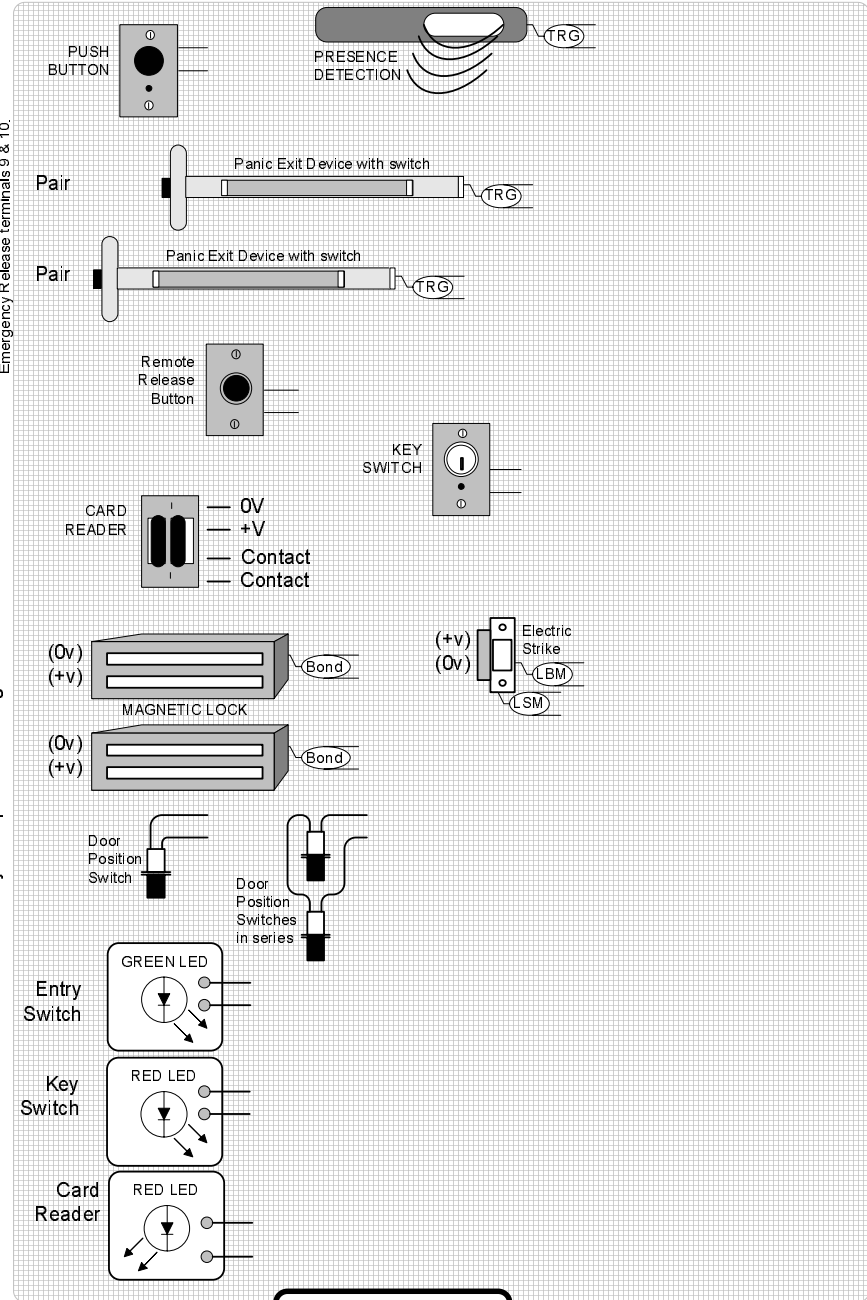
Regulated. DC (+V) in	. 32
Ground (0V)	. 33
Unregulated AC-DC 12/24 in	. 34
AC/DC in	. 35

POWER IN

9VDC Tap located on centre of Circuit Board

Power Tap (+V) out	. 36
Power Tap (+V) out	. 37
Power Tap (0V) out	. 38
Power Tap (0V) out	. 39

POWER OUT

PUSH BUTTON

PRESENCE DETECTION (TRG)

Pair — Panic Exit Device with switch (TRG)

Pair — Panic Exit Device with switch (TRG)

Remote Release Button

KEY SWITCH

CARD READER
— 0V
— +V
— Contact
— Contact

Connect one side of DPDT Relays to Emergency Release terminals 9 & 10.

Polarity for Inputs 40 through 49 can be either NC or NO

Momentary Exit - Door "A"	. 40
Momentary Exit - Door "A"	. 41
Momentary Exit - Door "B"	. 42
Momentary Exit - Door "B"	. 43
Momentary Entry Switch	. 44
Momentary Entry Switch	. 45
Alternate Entry Switch	. 46
Alternate Entry Switch	. 47
Manual Reset / Delay Reset	. 48
Manual Reset / Delay Reset	. 49

EXTERNAL DEVICE ACTIVATION INPUTS

(0v) (+v) MAGNETIC LOCK (Bond)

(+v) (0v) Electric Strike (LBM) (LSM)

(0v) (+v) MAGNETIC LOCK (Bond)

Door Position Switch Input	. 50
Door Position Switch Input	. 51
Bolt Position Switch Input	. 52
Bolt Position Switch Input	. 53

MONITOR INPUT

Door Position Switch

Door Position Switches in series

Momentary Exit Ext. LED	. 54
Momentary Exit Ext. LED	. 55
Momentary Entry Ext. LED	. 56
Momentary Entry Ext. LED	. 57
Alternate Entry Ext. LED	. 58
Alternate Entry Ext. LED	. 59

EXTERNAL DEVICE Led's

Entry Switch — GREEN LED

Key Switch — RED LED

Card Reader — RED LED

Terminals 1 through 31

OUTPUT SIDE

Note:
The default setting for Led drivers is always On. To enable activation only when the associated input is activated. Change Dip S3 position #8 to Off.
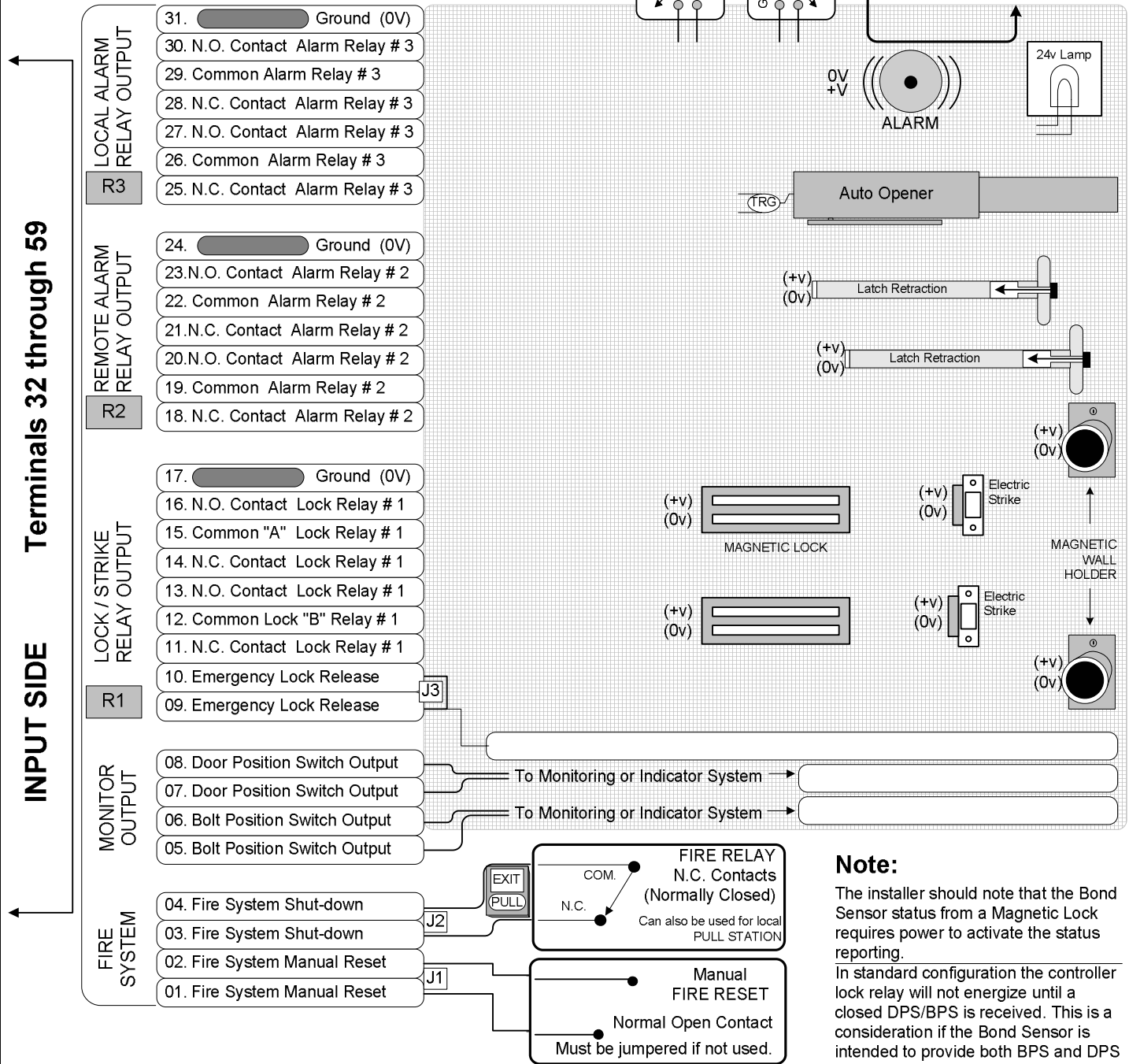
S80-111

ULC UL LISTED

DATE:
REV. :

RGM / 28JUN99

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Project:
Application:
Supplier:

6

Work-up Configuration Sheet

OUTPUT TERMINATIONS and FIRE SYSTEM

Relays can be jumper selected for Wet or Dry output *Ref: Section 1.2*

Control Panel Indicator Led's

RED LED GREEN LED

INPUT SIDE   **Terminals 32 through 59**

LOCAL ALARM RELAY OUTPUT — R3
- 31. Ground (0V)
- 30. N.O. Contact Alarm Relay # 3
- 29. Common Alarm Relay # 3
- 28. N.C. Contact Alarm Relay # 3
- 27. N.O. Contact Alarm Relay # 3
- 26. Common Alarm Relay # 3
- 25. N.C. Contact Alarm Relay # 3

REMOTE ALARM RELAY OUTPUT — R2
- 24. Ground (0V)
- 23. N.O. Contact Alarm Relay # 2
- 22. Common Alarm Relay # 2
- 21. N.C. Contact Alarm Relay # 2
- 20. N.O. Contact Alarm Relay # 2
- 19. Common Alarm Relay # 2
- 18. N.C. Contact Alarm Relay # 2

LOCK / STRIKE RELAY OUTPUT — R1
- 17. Ground (0V)
- 16. N.O. Contact Lock Relay # 1
- 15. Common "A" Lock Relay # 1
- 14. N.C. Contact Lock Relay # 1
- 13. N.O. Contact Lock Relay # 1
- 12. Common Lock "B" Relay # 1
- 11. N.C. Contact Lock Relay # 1
- 10. Emergency Lock Release
- 09. Emergency Lock Release — J3

MONITOR OUTPUT
- 08. Door Position Switch Output
- 07. Door Position Switch Output
- 06. Bolt Position Switch Output
- 05. Bolt Position Switch Output

FIRE SYSTEM
- 04. Fire System Shut-down
- 03. Fire System Shut-down — J2
- 02. Fire System Manual Reset
- 01. Fire System Manual Reset — J1

0V / +V ALARM

24v Lamp

TRG Auto Opener

(+v)(0v) Latch Retraction

(+v)(0v) Latch Retraction

(+v)(0v) Electric Strike

(+v)(0v) MAGNETIC LOCK

(+v)(0v) Electric Strike

(+v)(0v) MAGNETIC WALL HOLDER

To Monitoring or Indicator System

To Monitoring or Indicator System

EXIT PULL — COM. / N.C.
FIRE RELAY N.C. Contacts (Normally Closed)
Can also be used for local PULL STATION

Manual FIRE RESET
Normal Open Contact
Must be jumpered if not used.

Note:
The installer should note that the Bond Sensor status from a Magnetic Lock requires power to activate the status reporting.

In standard configuration the controller lock relay will not energize until a closed DPS/BPS is received. This is a consideration if the Bond Sensor is intended to provide both BPS and DPS information. Enable "Relock On" feature - Dip S2, #1 to On

J1	Install Jumper connecting Terminals 01 & 02 if Fire System is to reset PAC Controller automatically.
J2	Install Jumper connecting Terminals 03 & 04 if Fire System integration is not a part of this system.
J3	Install Jumper connecting Terminals 09 & 10 if Emergency Override is not a part of this system.

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S80-110

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The setup drawings should be copied **prior to marking**. Use the copies to make your work-up sheets. The final configuration, after hook-up is confirmed to be operational, should then be transferred to the manual and left with the installation so that future service, if requried, can be done without first having to trace wires from the external devices.

7

The **default settings provided from the factory** are generally accepted as to what constitutes normal operations for a door locked by a magnetic lock, or a locked situation requiring a "legal exit" (Request to Exit) for exiting. The abbreviated acronym for this sequence is REX, a "request to exit ", an input to the program that a legal event is about to take place. The REX signal input is to shunt an alarm program in the controller before proceeding to open the door from the inside to exit. The inside mechanical operations to effect an exit are either a momentary trigger input from a push button or panic exit device with a switch incorporated. The switch will cause a release of the lock relay R1 for a time period of 8 seconds. When the grant time for release expires, the door should be closed and again secure. If it is not, the program will cause one (1) operation to occur and a second (2nd) operation may

Operation

follow.

1. Relay R3 will activate (de-energize) and if a local audio alert is connected, it will sound for up to 45 seconds. The alarms are configured to reset from a DPS (Door Position Switch) closure and if the door is closed before the 45 second timer times-out, the controller is then reset to start a new cycle or activity.

Operation

2. Should the door not be closed and not report secure at the end of the 45-second cycle, relay R2 will activate as a remote alarm. A remote alarm could be the activation of a dialer within an intrusion or access monitoring system or a secondary audio output in a different location. The message being that the door is not closed/secure and no one has responded to the local alarm activity so we are now calling upon a remote service to rectify the situation.

If .... an electric strike is employed and a REX is not provided when the retraction of the bolt occurs, an instant alarm will occur when the door is cycled, signaling a "forced entry" alarm that will cause both relays R2 and R3 to de-energize. The controller program is always looking at the DPS/BPS inputs for activity that occurs when doors cycle or latch bolts are retracted. If the movement is not proceeded by an input from terminals 40 through 47, a legal event, the assumption is that a forced entry or unauthorized exit is taking place. Auxiliary relays R2 and R3 will automatically activate.

If .... a DPS/BPS switch is not employed, at the end of the grant for release period, the lock relay R1 will reset and the controller will assume the door is closed and locked. *There will be no activity*
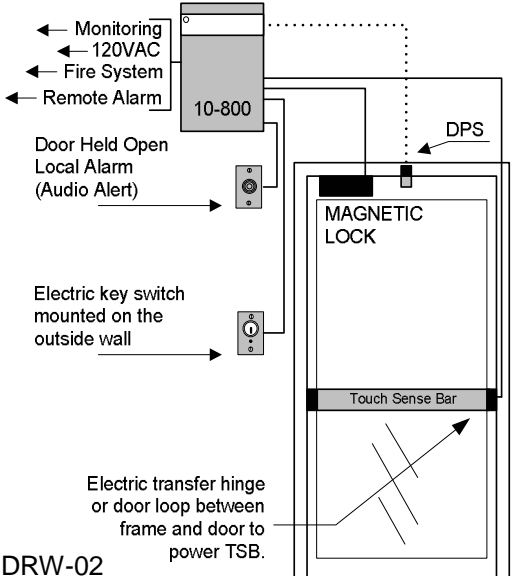
DRW-02

This is a basic component selection for access and egress control using a magnetic lock to secure the door with the legal exit input coming from the Touch Sense Bar.
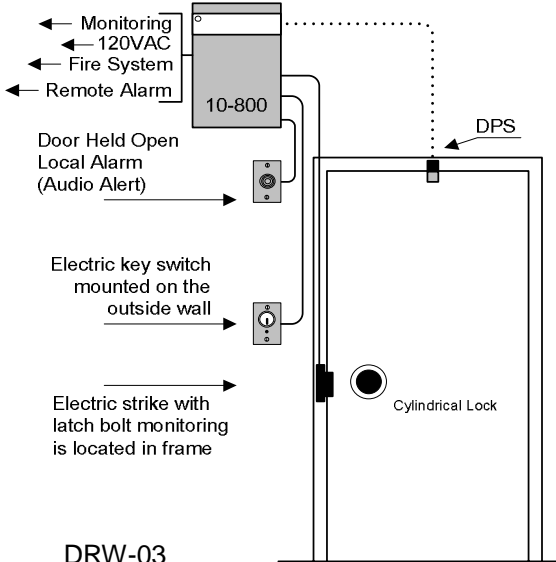
DRW-03

This is a basic component selection for access and egress control using an electric strike to secure the door with the legal exit input coming from the Bolt Position Switch.
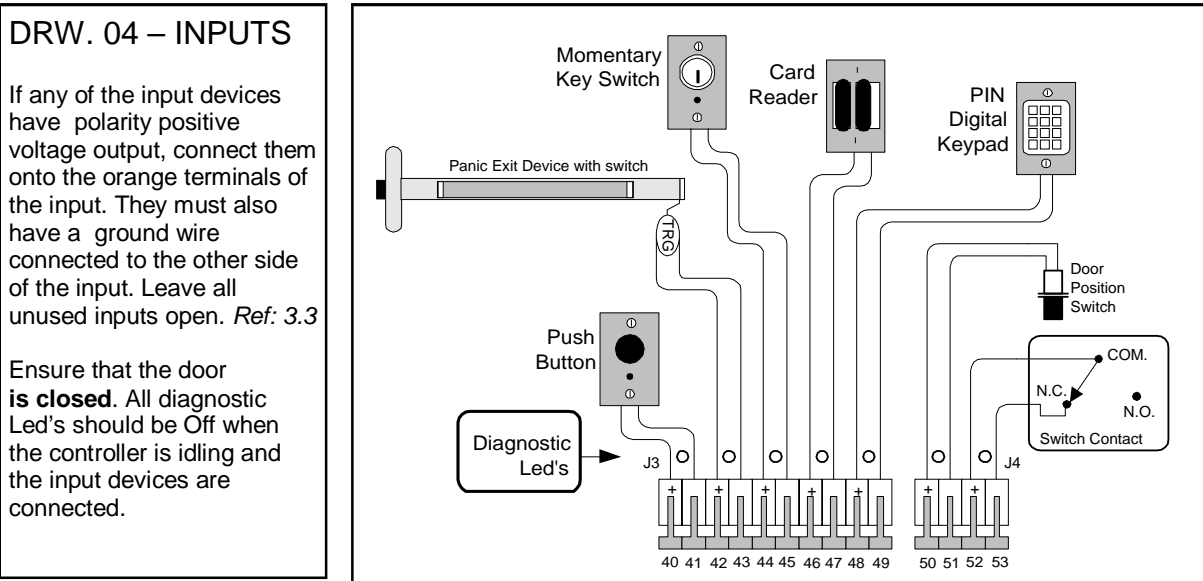
Overview of the default settings continued …….

If ... an On/Off (maintained or alternate action) switch is connected to the Alternate Entry terminals 46/47. Activity on this input will cause the output device (magnetic lock / electric strike) to de-activate when Off is selected and activate when On is selected. For example the portal can be opened for daytime operations and locked secure at night or during other non-operational times. A time clock or key switch would be examples of devices connected to these input terminals.

If ... a card reader, digital keypad or other user discriminating device is connected to the controller it is usually connected to these same terminals 46/47. These types of devices have a grant for release time available within their programming capabilities and will make the decision as to when, and for how long, the locking mechanism will be released.
See Ref: Maximizing Input and Output device ….. 3.0

DRW. 04 – INPUTS

If any of the input devices have polarity positive voltage output, connect them onto the orange terminals of the input. They must also have a ground wire connected to the other side of the input. Leave all unused inputs open. *Ref: 3.3*

Ensure that the door **is closed**. All diagnostic Led's should be Off when the controller is idling and the input devices are connected.

1.1 ADDING INPUT DEVICES .... to the default configuration

There are 7 input device connections available and all are functional to the factory default settings, they are identified as:

1. Momentary Exit "A"	terminals 40 & 41	will trigger the timed release of lock relay R1
2. Momentary Exit "B"	terminals 42 & 43	will trigger the timed release of lock relay R1
3. Momentary Entry	terminals 44 & 45	will trigger the timed release of lock relay R1
4. Alternate Entry	terminals 46 & 47	will alternately turn lock relay R1 Off, then again to On
5. Momentary Reset	terminals 48 & 49	will reset auxiliary relays R2 and R3 when selected as manual
6. DPS	terminals 50 & 51	will report Door Position from closed contacts opening
7. BPS	terminals 52 & 53	will report Bolt Position from closed contacts opening

The default program for positions 40 through 49 is seeking NO (Normal Open) contacts, whereas 50 through 53 are seeking NC (Normal Closed) contact status of the switches connected to the input terminals. In order that this need does not become an issue for supply of switches of designated contact type to invoke an input, <u>the controller has been designed to accept either a NO or a NC</u> (Normal Closed) set of contacts. Each input set of terminals has a corresponding diagnostic Led associated that will turn On if the NO/NC logic is in argument with the program configuration. All diagnostic Led's should be Off when the controller is idling and to accomplish this, change the associated dip settings on Dipswitch S3. The first 7 dip settings 1 through 7 will change the polarity setting of each of the inputs.

Adding Input Devices continued ……...

DRW – 05   DIPSWITCH

The illustration is the default positions for dipswitches on Dip blocks S1 / S2 and S3 / S4 in STANDARD mode.
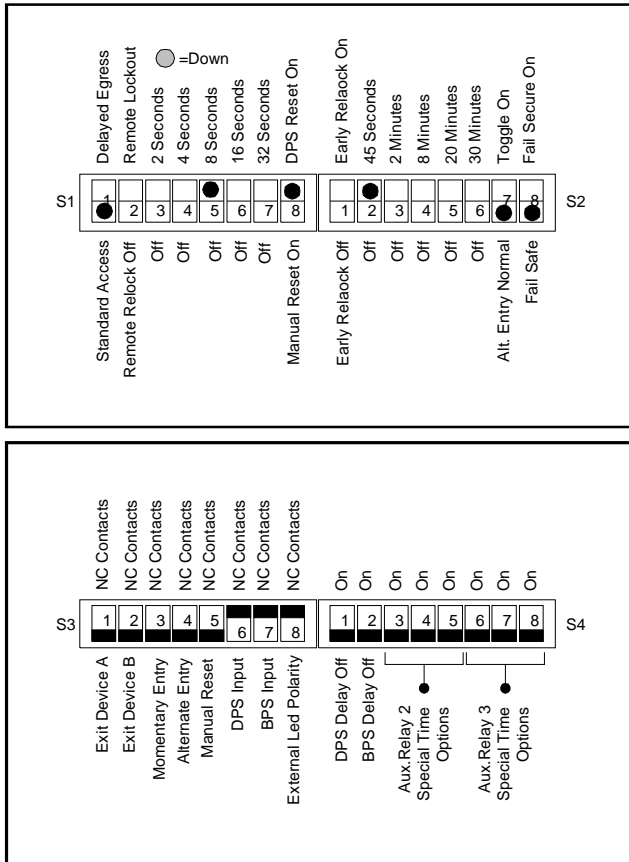
To extend the grant time of lock release, change any dipswitch from 3 through 7 to On using dip block S1. The grant timer will reset to zero when the DPS/BPS contact again close.

Remote lockout is described in Section 2.2

Toggle mode is described in Section 1.1

The program is assuming that a DPS and BPS are connected. If the controller is powered up without the DPS/BPS having devices connected, relays R2 and R3 will immediately activate, assuming a forced entry has occurred. Change the polarity setting if either the DPS or BPS are not a part of the application, the relays R2 and R3 will reset (this will enable the internal shunt).

External Led's connected to terminals 54 through 59 are default toOn. Dipswitch #8 on dip block S3 if changed to the opposite of the default setting, the Led's will always be Off until the input is activated.

S1 block (top labels): Delayed Egress, Remote Lockout, ○=Down, 2 Seconds, 4 Seconds, 8 Seconds, 16 Seconds, 32 Seconds, DPS Reset On
S1 block (bottom labels): Standard Access, Remote Relock Off, Off, Off, Off, Off, Off, Manual Reset On

S2 block (top labels): Early Relaock On, 45 Seconds, 2 Minutes, 8 Minutes, 20 Minutes, 30 Minutes, Toggle On, Fail Secure On
S2 block (bottom labels): Early Relaock Off, Off, Off, Off, Off, Off, Alt. Entry Normal, Fail Safe

S3 block (top labels): NC Contacts, NC Contacts, NC Contacts, NC Contacts, NC Contacts, NC Contacts, NC Contacts, NC Contacts
S3 block (bottom labels): Exit Device A, Exit Device B, Momentary Entry, Alternate Entry, Manual Reset, DPS Input, BPS Input, External Led Polarity

S4 block (top labels): On, On, On, On, On, On, On, On
S4 block (bottom labels): DPS Delay Off, BPS Delay Off, Aux.Relay 2 Special Time Options, Aux.Relay 3 Special Time Options

Full explanation of dipswitch settings are discussed in the next Section 2.0, Sub Section 2.1. Dipswitches are illustrated in this section to provide a quick review of the functions for those familiar with their operation and the programming capabilities that are readily recognized by the identity labels attached to each dipswitch.

The polarity of the input switches being applied may be in argument with the program and a change from NC to NO is easily configured by sliding the dip to its opposite position.

Dip 1 changes input 40/41	Momentary Exit A	
Dip 2 changes input 42/43	Momentary Exit B	
Dip 3 changes input 44/45	Momentary Entry	
Dip 4 changes input 46/47	Alternate Entry (Maintained)	
Dip 5 changes input 48/49	Manual Reset (Momentary)	

Momentary Exit A and B – terminals 40 through 43, are the inputs provided to enable an exit sequence to occur that will activate a programmable timer for a release period. Part of this sequence is the instruction to the controller that a legal exit is about to take place and not to go into an alarm state when the door position switch input contacts are read as going open by the program. Also this setup allows for hardware applied to a pair of doors to operate independently of each other. In many instances exit devices require power for their operation and if both doors are to release from either device, a cross-feed is likely if current blocking components such as diodes are not incorporated into the circuit. The Series 800 Controller setup for two doors eliminates any possible conflict and also serves as a separation when the controller is configured for 2-Door mode.

Adding Input Devices to the Default Configuration continued ……....

If .... the controller is switched into "Delayed Exit" mode; 40 through 43 are the only inputs that will trigger activation of the time delay cycle to exit.

Momentary Entry – terminals 44/45, is the input that will enable a programmable grant time for entry over lock relay R1 and it responds to the same time sequence as the Momentary Exit inputs.

If .... a discriminating external device such as a card reader or digital entry controller is a part of the application, it may make a better application to have the Series 800 Controller provide all of the release timing sequence for lock relay R1. The output trigger of the device connected should be configured to provide a "pulse" output, if not, a timed output of 1 second will also suffice. A momentary push button as a remote release is a common application to terminals 44/45.

If .... a remote lockout is required; this is the only input that is effected by the program when selected. *See Ref: to Remote Lockout 2.2*

If .... 2-Door mode is selected, this input internally changes state and is re-configured to an "Alternate" (maintained) type input and responds as the On /Off control function over door "A". *See Ref: 2-Door Operations 2.4*

Alternate Entry – terminals 46/47, is the input that provides a method of On/Off control over relay R1, the lock relay. When invoked, all operations associated to the devices connected to relay R1 are Off. The lock relay will de-energize and the auxiliary relays R2 and R3 will remain energized and in-active to DPS/BPS state changes. This input is used for integrating access control system readers, time clock operations and control at the door by a maintained type key switch.

If …**Toggle mode** is a required function, it is also an On/Off control enabled through input 46/47 by a dipswitch setting. Toggle action is a feature most commonly employed when a lock has to be controlled from more than one point. An example of this would be a local On/Off switch at the opening and a control panel doing the same function from a Control room. If not handled as toggle activity, they would not be able to hand control back and forth to each other. Toggle mode requires that **both switches be NO** (Normal Open) **Momentary type connected in parallel and then connected to the input.** Each successive input changes the state of the relay from what its position was previously. *Ref: Maximizing Input and Output device control - Multiple point release inputs 3.5*

If .... remote lockout is enabled, this input becomes the external switch to turn the lockout On or Off from the remote location and it is no longer available for On/Off control over lock relay R1. *See Ref: to Remote Lockout 2.2*

Manual Reset / Delay Reset – terminals 48/49, is a dual function reset that is automatically positioned through program mode selection. The auxiliary relays R2 and R3, once activated, can be dipswitch programmed to reset from a door position status switch (DPS/BPS) that closes when the door is closed after opening. Or the dipswitch program can be set to cause these relays to latch when activated (de-energized), requiring a manual reset. The default setting is automatic by the state change, open to close of the DPS/BPS contacts on terminals 50/51 and 52/53.

If ... delayed exit mode has been selected and the code compliant operation selected requires a manual reset to activate the lock after an exit cycle has been completed. This is the input that the reset device is to be connected to and it is referred to as the "Delay Reset". *See Ref: Delayed Exit operation 2.3*

Adding Input Devices to the Default Configuration continued ……….

DPS/BPS – terminals 50/51, 52/53, are the most necessary inputs and **at least one of them** should be a part of every application. They provide the status of the door and locking devices to the controller program to enable it to know when to enable all functions beyond the rudimentary lock release timer. Even though they are labeled as two different functions, they both provide the same status information. Both require an input switch with closed contacts that open to indicate a position change between the door and frame, a position change from a bolt being withdrawn from a strike or by a strike plate coming apart from a magnetic lock. The factory default position assumes switches **are installed**, and therefore the status monitoring is turned On. When a switch is installed and the contacts are closed, the **diagnostic Led will turn Off**, slide the dip setting #6 or #7 on Dip S3 to the opposite of the default position if either of the switches is not used.

If .... 2-Door mode is selected; these inputs align internally and are each configured to monitor the status of one of the doors movements. The DPS, 50/51 are enabled as Door "A" and the BPS, 52/53 are enabled as Door "B". *See Ref: 2-Door Operations 2.2*

If … a simple REX is required to shunt an external monitoring system while the door is being cycled, within the time allocated, the DPS and BPS can be used together. The DPS is the door position switch and the BPS becomes the REX with the output terminals 5/6 providing the shunt input information to the external system. The input shunt to the external system does not take effect until the door cycles after a valid exit or entry input, so it must reach the external system before the DPS output indicating that the door is cycling. To accomplish this we slow the DPS output signal from terminals 7/8 by changing Dipswitch S3, position #1 to Delay On. This will provide a delay of approximately 1-second between DPS activation on 50/51 and the output at 7/8. Connect a jumper wire between terminals 50/52 so that both inputs will trigger on door movement. As soon as the door moves, an instant signal to shunt moves though the controller and out on 5/6 to the external monitoring system to invoke the shunt feature while the DPS signal is delayed before being sent. By the time the external system sees the DPS, the shunt is already in place. When the door closed, the DPS will reset the controller.

Note: if the controller does not receive a legal input prior to door movement, the output on 5/6 and 7/8 will be instantaneous, indicating a forced entry is taking place. The external monitoring system will go into alarm as a result of both the shunt and alarm signal arriving at the same moment.

1.2 ADDING OUTPUT DEVICES to the default settings

There are 6 relays associated to the RLB800 controller circuit board. One is dedicated to fire operations, five can be programmed for numerous operations by dipswitch settings or through the repositioning of jumper link switches. This section of the manual deals with output operations **available from the default settings already positioned for the output relays.**
For relay capacity and other specifications. *Ref: Electrical Specifications Section 4.4*

The installer should be aware that most building codes mandate a fire system integration if magnetic locks are installed on doors deemed to be exits or a path to exit.

DRW – 06
Output Relays
Are rated as:

R1– 24V @2A
R2– 24V @ 2A
R3– 24V @ 5A

Note:
Some controllers may be provided with 8A or 10A relay for the R3 position.
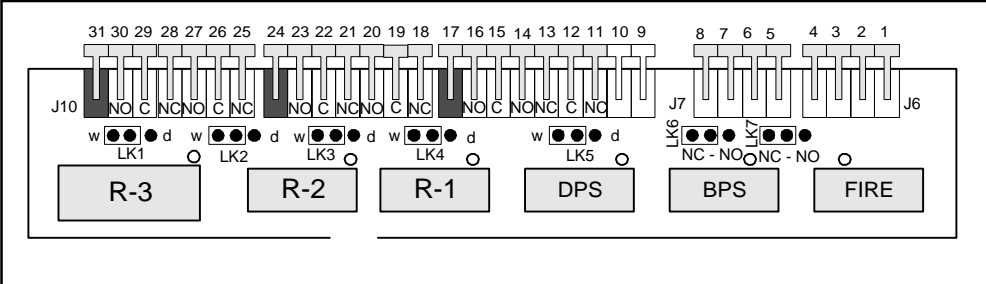
Fire Relay Reset – terminals 1/2, the Momentary output switch connected across these terminals is always a set of NC (Normal Closed) contacts. The momentary opening and again closing of the contacts causes the reset to take effect. It is provided from the factory with a wire jumper (J1) installed. If it this not utilized because a fire system is not employed, J1 must remain in place for the controller to be operational on power-up. In most instances a discriminating device, for example a key switch, is connected to this output so that only authorized personnel can make a reset after a fire system shutdown.

If ... the controller is part of a system of many controllers whereby a remote power source is provided, a desire for a single reset location as part of a fire system is a likely situation. In this instance a wire jumper across the reset terminals would remain in place. The central fire system would provide the reset.

If .... the fire AHJ allows the locking system to again become active when the fire system is reset, the wire jumper would also remain in place.

Fire (Dropout) Relay – terminals 3/4, the maintained output switch from the fire system control panel is always a set of NC (Normal Closed) contacts in the form of a relay. The factory default is provided as a wire jumper (J2) across these terminals in order that the controller relays can be powered-up during installation. If the contacts open, all relays on the controller will de-energize and remain in this state until a manual reset is invoked (unless terminals 1 and 2 are wire jumpered). Since fire systems are current sensitive as a part of their code compliance, the Series 800 Controller allows **less than 5mA of current to pass through these contacts**, regardless of what power supply
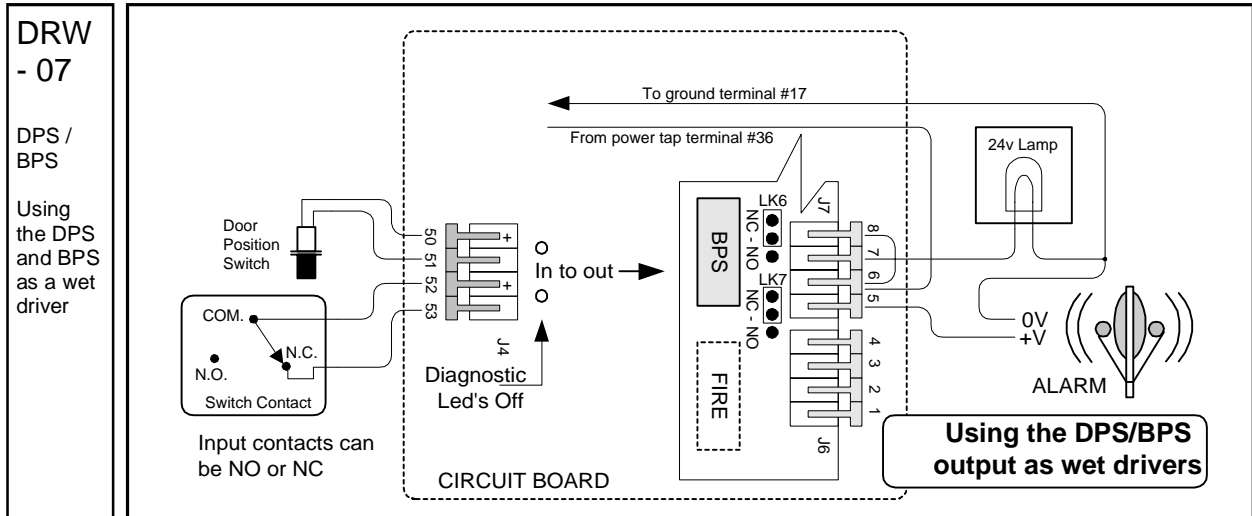current is available from the other four relays or the power tap.

BPS Relay, terminals 5/6, report the status change associated to input movement of switches connected to terminals 52/53. The factory default output is dry as most monitoring systems are only seeking an isolated contact state change to occur in order to invoke an input signal to their system.

If ... the installation is required to report a status change in a wet output form to activate a visual or audio alert, the dry output would of course not serve this purpose. The BPS relay contacts are rated

Adding Output Devices to the Default Settings …… BPS relay continued ………..

for 2 amperes @ 24VDC and if a jumper wire is installed from the power tap terminal 36 to terminal 6, the output is now equal to the output voltage of the controller, which is default set at 24VDC. Position the Ground from the visual or audio device to any board Ground (Green Terminals) and connect the positive (+) to terminal 5. The relay is now an On/Off switch, isolated, but enabled by the state change associated to the device switch connected at input 52/53.

DRW - 07

DPS / BPS

Using the DPS and BPS as a wet driver

Door Position Switch

Input contacts can be NO or NC

CIRCUIT BOARD

Using the DPS/BPS output as wet drivers

If ... the light status needs to be changed, a jumper link switch, LK7, located just below the relay has a factory default position of NC that will cause the audio or visual indicator to be constantly ON when the contacts are closed between terminals 52/53. To change the operation from always On to Off, change the jumper link switch to NO (Normal Open).

If ... the trigger switch across input terminals 52/53 is NO, use the default setting and adjust the dip-switch S3, position #7 to reflect the operation desired from the output of the BPS relay.

DPS Relay, this relay mimics the operation as described for the BPS relay, terminals 7/8 report the status change associated to input movement of switches connected to terminals 50/51. The factory default output is dry as most monitoring systems are only seeking an isolated contact state change to occur in order to invoke an input signal to their system.

If ... the installation is required to report a status change in a wet output form to activate a visual or audio alert, the dry output would of course not serve this purpose. The DPS relay contacts are rated for 2 amperes @ 24VDC and if a jumper wire is installed from the power tap terminal 36 to terminal 8, the output is now equal to the output voltage of the controller, which is default set at 24VDC. Position the Ground from the visual or audio device to any control board Ground (Green Terminals) and connect the positive (+) to terminal 7. The relay is now an On/Off switch, isolated, but enabled by the state change associated to the device switch connected to input at 50/51.

If ... the light status needs to be changed, a jumper link switch, LK6, located just below the relay has a factory default position of NC that will cause the audio or visual indicator to be constantly ON when the contacts are closed between terminals 50/ 53 To change the operation from always On to Off, change the link jumper switch to NO (Normal Open).

If ... the trigger switch across input terminals 50/51 is NO, use the default setting and adjust the dip-switch S3, position #6 to reflect the operation desired from the output of the BPS relay.

Adding Output Devices to the Default Settings ……. DPS relay continued ………..

Note: if both the DPS and BPS outputs are to be wet (24VDC), only 1 wire jumper is required from the power tap terminal 36. To enable both sides of the relay as wet, connect a small wire jumper between terminals 6 and 8.

DRW – 08 Output Relays	
One change from the default setting has been made to accommodate the CCTV trigger. Jumper LK2 has been moved to "d" to make terminals 25, 26 and 27 dry. Relay R2 is still available and is able to accommodate an auto-opener or a retractor panic and then linking it to relay R1.	
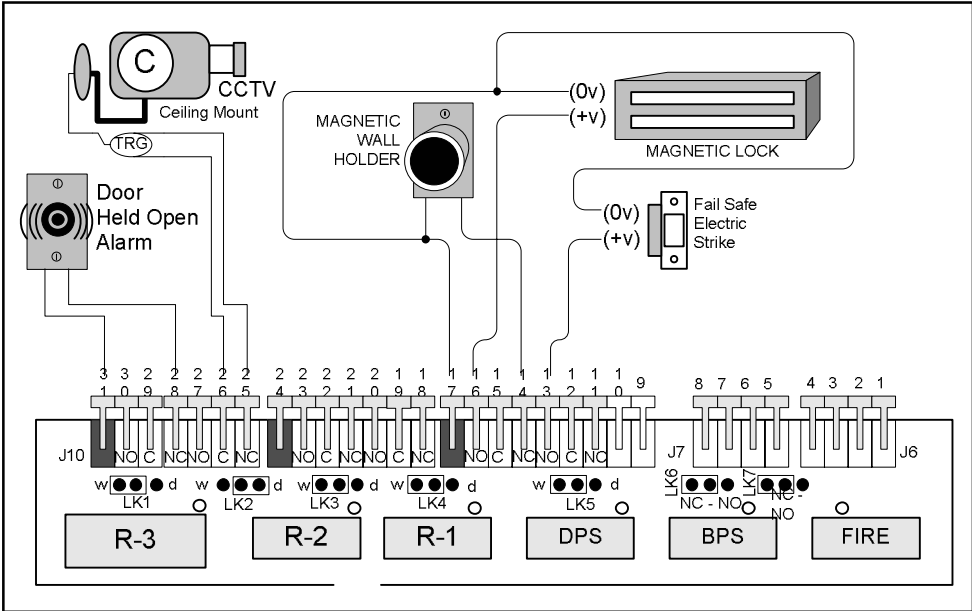
Lock Relay R1 – terminals 11 through 16, the lock relay is of a DPDT (double pole, double throw) configuration that has two sets of NC/NO contacts with a common pole. The default power to the common poles is 24VDC (+v). Devices that require power to activate can be connected to terminals 13 and 16 and are identified as fail-safe type devices since they will release upon the removal of power. Devices that require power to effect a release can be connected to 11 and 14 and are identified as fail-secure since they will lock secure upon loss of power. The ground can always be connected to 17/24 or 31.

If ... it is required that the lock relay R1 control power from an external supply source the relay can be dried-out by changing the jumper link switch LK5 from wet to dry. Normally the power input would connect to the common terminals 12/15 and provide output control through the NO or NC contacts. An example (Relay R3) of this type of hook-up is necessary if AC current is required to power up the locking device and a remote transformer is being used as the power source. *Ref: DRW-10*

Emergency Lock Release terminals 9/10 are default connected by a wire jumper (J3) installed from the factory that serves to maintain (+v) power to the "fail safe" terminals 13/16 of the lock relay. If the connection between 9/10 is opened, power is removed from terminals 13/16 and the locking device connected will release, regardless of any action caused by the controller. To utilize this feature, a 2nd NC type switch has to be available from the input device, that could be a panic exit device or a lock with internal switches associated to the inside knob or lever for exit. When the device is activated, the primary switch triggers the inputs connected to terminals 40 through 44 and the secondary switch opens that is positioned across terminals 9/10, it will then will insure a lock release. *Ref: Section 3.3*

If ... the controller is set to delayed exit mode, do no use this feature as it will circumvent the delay cycle and release the lock immediately when the exit device is activated.

Note*: panic exit devices that have an internal switch, and are UL /ULC listed to activate an exit, are only listed for a dry contact output to trigger a secondary device (timer) to effect a lock release. They are not*

Adding Output Devices to the Default Settings ……. Note: panic exit continued ………..

listed to control a current load. The 2nd switch is not a part of the primary release system and is therefore acceptable for the emergency release function. Also a push button is not a suggested device as the button must remain depressed to effect an emergency exit and if it is not mounted to the frame it may be impossible to hold the button depressed and move the door open at the same time.

Auxiliary Relay R2 - terminals 18 through 23, this relay is of a DPDT (double pole, double throw) configuration that has two sets of NC/NO contacts with a common pole for each set. The default power to the common poles is 24VDC (+v). Devices that require power to activate are connected to terminals 20/23 and are identified as fail-safe type devices since they will release upon the removal of power. Devices that require power to effect a release are connected to 18/21 and are identified as fail-secure since they will lock secure upon loss of power. The ground can always be connected to 17/24 or 31.

Note: *this relay from the default status will report a "door ajar" alarm after relay R3 has timed out.*

If … other control services are required for this relay.
See Ref: Maximizing Input and Output device control Section 3.0

If ... it is required that the auxiliary relay, R2, control power from an external supply source, the relay can be completely dried-out by changing the jumper link switches LK3 and LK4 from wet to dry. Normally the power input would connect to the common terminals 19 and 22 and provide output control through the NO or NC contacts. As an added feature this relay can be divided into in two SPDT sections with each having it's own jumper link. This gives the user the ability to enable a combination of wet with dry output from the same relay. An example of this type of hook-up is necessary if AC current is required to power up an external low voltage alarm siren from a remote transformer and a dry output alarm signal is needed to activate an intrusion system for the same alarm. *Ref: DRW-10*

DRW – 09
Output Relay

Changes from the default setting have been made to accommodate the auto-opener trigger.

Jumper LK4 has been moved to "d" to make terminals 18,19 & 20 dry.
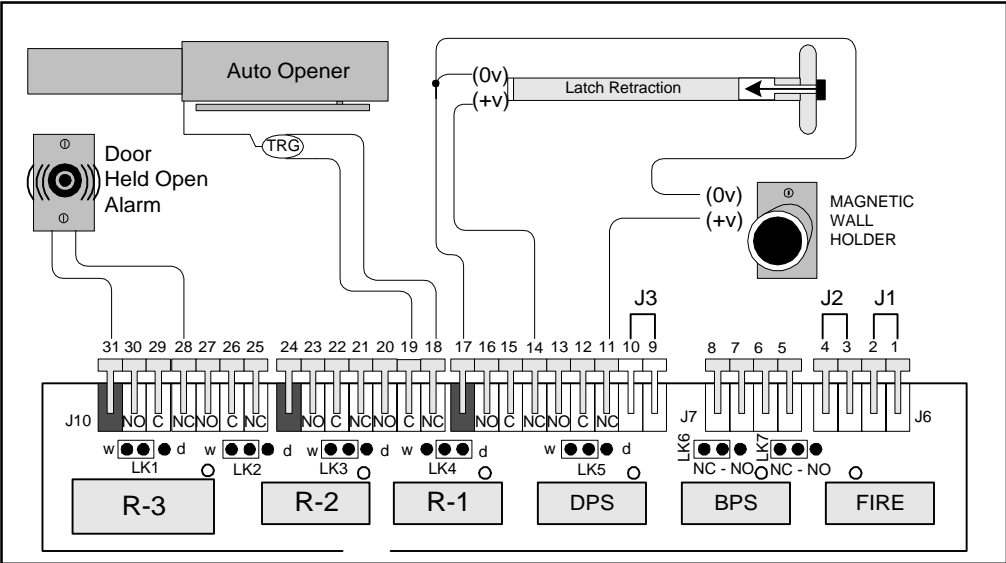
Auxiliary Relay R3 - terminals 25 through 30, this relay is a DPDT (double pole, double throw) configuration that has two sets of NC/NO contacts with a common pole for each set. The default power to the common poles is 24VDC (+v). Devices that require power to activate are connected to terminals 27/30 and are identified as fail-safe type devices since they will release upon the removal of power. Devices that require power to effect a release are connected to 25/28 and are identified as fail-secure since they will lock secure upon loss of power. (R3 relay due to production variations may be rated @ 8 or 10A.

Adding Output Devices to the Default Settings ……. Auxiliary Relay R3 continued ………..

Note: *this relay from the default status will report a "door ajar" alarm after relay R1 has timed-out if the door is not closed. The default activation time for R3 is 45 seconds before the time -out will then activate relay R2.*

If ... it is required that the auxiliary relay, R3, control power from an external supply source. This relay can be divided into two SPDT sections with each having it's own link jumper which gives the user the ability to enable a combination of wet with dry output from the same relay. In this instance half or the DPDT relay is dried-out by changing the link jumper switches LK1 to dry from wet. The power input would connect to the common terminal 29 and provides output control through the NO or NC contacts of R3. An example of this type of hook-up is necessary if a voltage or current other than the operating voltage/current of the controller is required to power up an external low voltage device. In this illustration a remote AC transformer and a 24VDC output are needed to illuminate a status indicator on a control panel and also drive a 12VAC horn. *Ref: DRW-10*

DRW – 10

Output through Relay R3

Using the default setting with one change to dry out one half of the relay by moving jumper link LK1 to dry enables the use of a different type of power.

Other uses associated to dry contact signals are outputs to monitoring or computer access systems.

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Section 2.0
Extended Modes

Extended modes enable the user to adapt the flexibility of the Series 800 Controller. Section 2.0 opens general programming opportunities to enhance basic functions beyond the default mode, by offering Delayed Exit, 2-Door control and Interlock operations between two doors – all from this one controller

Series 800 Controllers will control :

♦ 1 Pair of doors
♦ 1 Single door
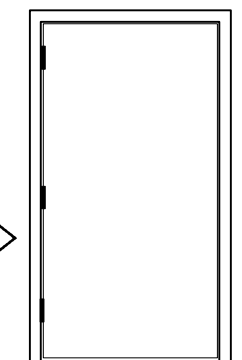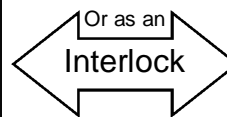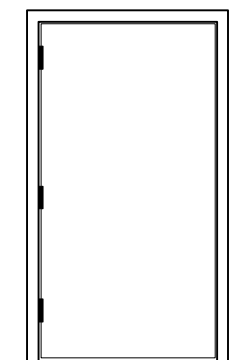   or
♦ 2 Single doors
    as
    NORMAL
    or
    INTERLOCKED
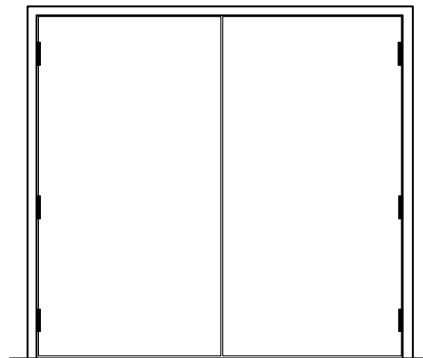
Pair of Doors
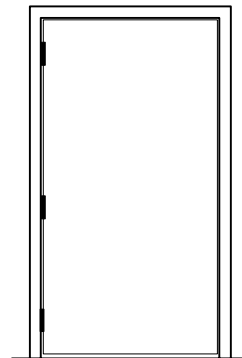
Single Door

2 Independent Single Doors

Or as an

Interlock

2.0 CONFIGURATION INSTRUCTIONS for enabling Dipswitch grant timing

As a quick overview -

The default setting from the factory provided an 8 second grant time for release of the lock relay R1 and enabled a second timer operation of 45 seconds for relay R3, the "door ajar" output when active. If an alarm at the door was connected to R3 it would sound for 45 seconds, if the door remained open beyond the 53 seconds, relay R2 would activate to provide a "remote" alarm if connected. Relay R2 will stay active until the door is closed as the controller in the default configuration is looking for a DPS/BPS state change to effect a reset.

2.1 Grant Time and Extended Grant Time, Relays R1, R2 and R3

Lock relay R1 - is the primary output relay associated to input devices connected to terminals 40 through 47 although only 40/41, 42/43 and 44/45 invoke timer operations. Terminals 46/47 are alternate On/Off control. Relay R2 will become the door "B" in 2-Door mode, R1 is door "A".

There are 4 dip blocks (red) mounted on the Series 800 Controller. The blocks **S1 and S2 are Rocker** Type switches and **S3 and S4 are Slide Type** to differentiate between the two sets as the controller board may be inverted when mounted. The 10-800 series is inverted to position the power connections to the top of the control box.

Sections 2.1 will detail settings for:

♦ Remote Lockout   0 = Down
♦ Grant time for lock relay R1
♦ Manual Reset / DPS Reset
♦ Early Relock – Bond Sensing Locks
♦ Extended Grant time & effect on relay R3
♦ Toggle Input and Output
♦ Fail Safe / Fail Secure

Delayed exit is detailed in Section 2.3, a separate section because dip blocks S1 and S2 shift their function calls to a program dedicated to delayed exit operations.

DEFAULT SETTING

Sections 2. 2 will detail settings for:

♦ External Led polarity
♦ Door Position Switch (DPS) delay
♦ Bolt Position Switch (BPS) delay
♦ 2– Door Control   [Section 2.4]
♦ 2 – Door Interlock Control   [Section 2.4]

Special time options for auxiliary relays R2 and R3 are extensive , only the 2-Door modes are described in this Section. Refer to Section 3.1 for timing option tables.

DEFAULT SETTING

Dip block S1 and S2 programming instructions continued ………..

Remote Lockout - is a feature best explained by example. If a digital keypad, key switch or card reader is connected to Momentary Entry input 44/45 it will allow a timed entry as set on dip block S1. If it is required that this entry not be used during certain periods, enabling remote lockout will negate any input received on 44/45. This is ideal for 7 day time clock operation where control over entry is desired for night / day or week ends. The time clock schedule switches the lockout feature On to Off as per the schedule. Exit is always available by connecting the exit-initiating device to 40/41 or 42/43. A simple alternate action switch is the easiest method of implementing remote lockout.

When invoked, remote lockout uses input 46/47 to enable the feature and if the installation requires a maintained switch for On/Off operations a choice of which function to use will have to be made between the two. The control is provided over input Momentary Entry 44/45, when the switch connected to 46/47 is selected to On, input 44/45 is locked out.

If … a "door ajar" alarm is required after the extended grant period has timed out, relay R2 will automatically trigger (de-energize) if the DPS/BPS contacts are not closed after opening.

If … the early relock feature is enabled (for bond sensing magnetic locks), the extended grant will still apply. The program relates to early relock as a separate cycle and still looks to the dip time selections for operations that will eventually trigger relay R2, if the door/bolt contacts are not closed after opening. Early relock energizes the lock relay(s) after approximately 6 seconds have lapsed.

Grant Time Relay R1 - dipswitch block S1 offers 5 variable settings to choose from; 2 sec, 4 sec., 8 sec., 16 sec. and 32 sec. either separately invoked or of any combination to make a maximum grant time release of 62 seconds for relay R1.

If … any of the time related inputs are invoked and the door is not cycled or a DPS is not installed, the timer will release relay R1 for the set grant time and then relock.

If … the controller is configured into 2-Door mode, each door would have this same time available for its respective cycle. Regardless of when either door is triggered to release by the input, each door is given a full count of the programmed time selected.

If … delayed exit mode is selected this block of switches are internally repositioned by the program to only enable the special features associated to delayed exit operations. *Ref: Section 2.3*

Manual Reset - DPS/BPS Reset is a selection that will invoke **latching** for relays R2 and R3 when used in an alarm reporting (default) capacity. The feature is often used for doors being responded to by an off-site service or when management requires attendance be made to the opening when an alarm occurs. Another reason may be to identify the source if a group of doors are involved and it is necessary to physically identify the particular door used. The manual reset, after latching, is accomplished by activating a momentary switch connected to terminals 48/49.

If … the "door ajar" alarm (relay R3) is activated, even though manual reset has been selected On, the relay will not latch if the door is closed and the DPS/BPS contacts are again closed after opening. The assumption being made is that a real alarm condition has not come into effect unless the door ajar warning is disregarded. When the extended grant (default 45-sec. dip block S2) expires, relay R2, if available, will activate and both relays will latch.
See Ref: Maximizing Input and Output, Section 3.1 Advanced time control

If … a time is not selected on dip block S2, for the time that the door ajar alarm is to be active, both relay R2 and R3 will activate when the lock release grant expires and the DPS/BPS contacts are not again closed.

Dip block S1 and S2 programming instructions continued ………..

Dip block S1 and S2 programming instructions continued ………..

If … a 2-Door configuration has been selected, relay R2 is now door "B", the second door. If relay R3 is triggered for any reason, it will latch and require a manual reset. *Ref: Section 2.4*

If … relay R3 is linked to either R1 or R2 through manual R3 jumper link switch (RLY3), **caution should be exercised** as relay R3 **will not** respond to a forced entry alarm input. Correspondingly if relay R2 is linked to R3 through manual R2 jumper link switch (RLY2), it will release the relay it is linked too when it is de-energized as it responds to the alarm.
See Ref: Maximizing Input and Output, Section 3.2 for set-up

Early Relock - is a feature specifically positioned to respond to bond sensing activity as used in magnetic locks. When the application is using the bond sensing as a door status or lock status indicator, the controller is looking to the device to confirm status for position as well a re-locking trigger so that a door, when closed will reset the timer to zero. If the lock relay has not re-energized because the grant is still active even though the door is closed, tailgating may occur. The true bond-sensing feature requires power in order to report status; if the lock relay(s) is/are de-energized there will not be a status report.

When enabled, the Early Relock feature will begin an internal count of approximately 6 seconds at the end of which it will re-energize the lock relay(s). In this way the lock reporting status will be enabled before the strike makes contact with the magnetic lock. Any time still available on the grant will be cancelled. A time of 6 seconds is provided to allow time for an individual to cycle the door in the event that the trigger is not close to the door or they require more time for whatever reason. The grant time selected on S1 must exceed 6 seconds to enable the program to look to the bond circuit in order not to create a door held open alarm.

If … for example a grant time of 20 seconds has been selected and the lock relay(s) re-energize after 6 seconds and the door remains in the open position, the "door ajar" alarm will wait for another 14 seconds before reporting an alarm.

Extended Grant Time - dipswitch block S2 provides extended grant times for relay R1 if the activity of R3 is ignored as the extended time selected will de-energize R3, it is linked by program (unless otherwise configured) to the operations of the lock relay R1. The DPS/BPS must be activated by the door cycle to realize any extended grant operations. **To utilize any time period selected through S2 as an extend grant to the lock relay R1 means that R3 cannot be used for any other purpose.** The time choices are 45 sec., 2 min., 4 min., 8 min., 16 min., 32 min., either separately invoked or of any combination to make a maximum grant time release of 62 minutes, 45 seconds plus the time selected through dipswitches S1 for relay R1.

If … a "door ajar" alarm is required after the extended grant period has timed out, relay R2 will automatically trigger (de-energize) if the DPS/BPS contacts are not closed after opening.

If … in 2-Door mode R2 is being utilized as door "B" , the program will know that **R3 is the only alarm output available** and will provide the "door ajar" output at the end of the extended grant, plus lock grant. If 8 seconds is the grant and 45 seconds is the extended grant, this will equal a total grant of 53 seconds. *Ref: Section 2.4 for 2-door mode*

If … the early relock feature is enabled (for bond sensing magnetic locks); the extended grant will still apply. The program relates to early relock as a separate cycle and still looks to the dip time selections for operations that will eventually trigger relay R2, if the door/bolt contacts are not closed after opening.

Toggle mode is a setting that effects the operation of input 46/47, the On / Off control over the lock relay(s). Toggle action is a feature most commonly employed when a lock has to be controlled from

more than one point. An example of this would be a local On/Off switch at the opening and a control panel doing the same function from a Control Room. If not handled as toggle activity, they would not be able to pass control back and forth to each other so that both switches always remain active. Toggle mode requires that **both switches be NO** (Normal Open) **Momentary type, connected in parallel and then connected across the input.** Each successive input changes the state of the relay from its previous position.

Toggle operations can be implemented with 2-Door Operations and Interlock Control. The Momentary inputs are not effected by toggle operations and perform their respective timing operations with or without toggle mode being selected. *Ref: Maximizing Input and Output device control - Multiple point release inputs 3.5*

Fail-Safe / Fail-Secure are terms applied to locking devices and can be related to as whether power is required to lock or unlock the device. Locking devices that require power to lock are deemed to be fail safe and those requiring power to release (unlock) are fail-secure. Control over this feature is located on dip block S2, dipswitch #8. The relay is de-energized normal when fail-secure is selected.

If … 2-Door mode is selected, both relays R1 and R2 will follow the fail-safe / fail-secure program shift.

2.2 CONFIGURATION INSTRUCTIONS for enabling Dipswitch function calls

External Led polarity - is a feature that effects the output Led drivers attached to external devices. They mimic the inputs 40/41, 42/43, 44/45 and 46/47. The idle setting is switched from the Led's being always On to always Off, with activation either turning them On or Off. In the On position they may attract vandals to the devices or they may be required to be illuminated to draw attention to where the device is located. The dip block is S3 and the dipswitch is #8. The driver will activate a Led directly connected or a Led/resistor combination (12V or 24V). Led's are polarity conscience and the terminal set-up is Orange for positive volts and Grey for negative. The terminal configuration is:
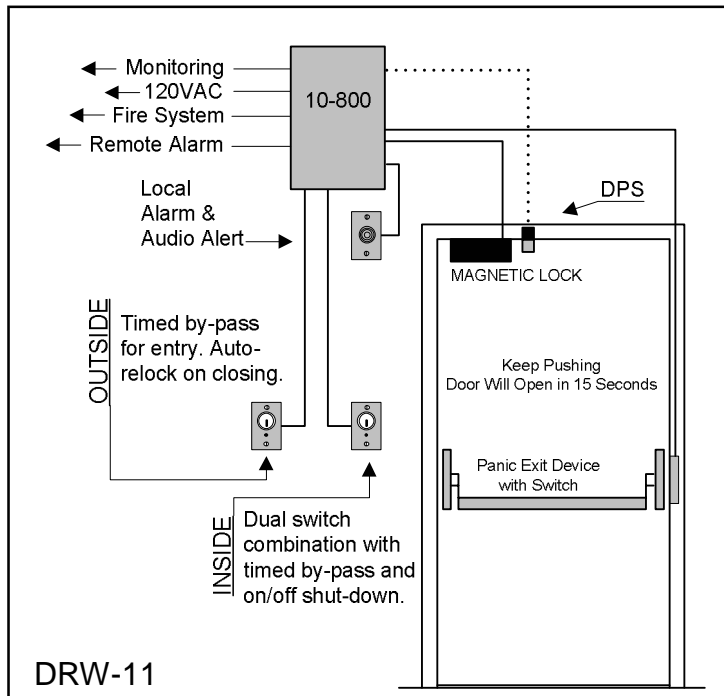
1.	Momentary Exit	terminals 54/55	flashing On/Off	inputs 40/41, 42/43
2.	Momentary Entry	terminals 56/57	flashing On/Off	input 44/45
3.	Alternate Entry	terminals 58/59	On/Off	input 46/47

If … 2-Door mode is activated, the Momentary input 44/45 is shifted by the program to perform as an alternate entry input for door A as alternate entry 46/47 is now shifted to work only door B. The momentary entry Led 56/57 remains attached to input 44/45 but is now mimicking an alternate On/Off output as opposed to the timed output that was momentary input 44/45. The reason for this change is apparent when control panel work is part of the application. The flashing (timed) operations are necessary to indicate timed activity on a panel, such as by-pass. Alternate On/Off can be easily replicated by taking a connection from output lock relay R2 to provide On/Off Led status for door B.

If … in a single door setup a simple REX is required to shunt an external monitoring system while the door is being cycled the DPS and BPS can be used together. The DPS is the door position switch and the BPS becomes the REX with the output terminals 5/6 providing the shunt input information to the external system. The input shunt to the external system does not take effect until the door cycles, after a valid exit or entry input, so it must reach the external system before the DPS output does, indicating that the door is cycling. To accomplish this we slow the DPS output signal from terminals 7/8 by changing Dip S4, position #1 to **Delay On**. This will provide a delay of approximately 1-second between DPS activation on 50/51 and the output at 7/8. Connect a jumper wire between terminals 50/52 so that both inputs will trigger on door movement. As soon as the door moves, an instant signal to shunt moves though the controller and out on 5/6 to the external monitoring system, to invoke the shunt feature while the DPS signal is delayed before being sent. By the time the external system sees the DPS, the shunt is already in place. When the door closed, the DPS will reset the controller.

2.3 CONFIGURATION INSTRUCTIONS for enabling DELAYED EXIT MODE

Monitoring
120VAC
Fire System
Remote Alarm

10-800

Local
Alarm &
Audio Alert

DPS

MAGNETIC LOCK

OUTSIDE

Timed by-pass
for entry. Auto-
relock on closing.

Keep Pushing
Door Will Open in 15 Seconds

INSIDE

Dual switch
combination with
timed by-pass and
on/off shut-down.

Panic Exit Device
with Switch

DRW-11

The Series 800 Controller is offered both as a component and also as a UL Listed System for delayed exit operations. When used with Securitron Magnetic Locks, series 32 or 62 and Touch Sense Bar TSB-3 or Sargent Panic Exit Devices, series 12-56, 12-58, 12-59, the combined component application is listed by Underwriters Laboratories as a system under category FWAX, Special Locking Arrangements.

Delayed exit modes are special modes of operation that control the release of a magnetic lock. A specific delay will occurr from the moment that an egress is attempted by the individual pushing on the bar of a panic exit device. Delayed exit locking systems are usually applied to emergency exit doors or on paths to exit doors. DRW –11 is a typical set-up.

Therefore this application is strictly regulated and the controlling device(s) must be listed and marked as being in compliance with the "special locking arrangements" code through a recognized listing agency such as UL or ULC in Canada and in particular they must be connected to the building fire system. The Series 800 Controller will respond to NFPA, BOCA, UBC, SBC and NBC (Canada) requirements through programming options. **The functions and limited variables associated to each of the delayed operations are forced to adhere to known requirements by the controller program. If there are any questions concerning the use of these modes, they should be directed to the governing AHJ over building regulations in the local of the intended installation.**

All of the codes available from the Series 800 Controller have variables associated to their operations, but in general they function as follows: the door is secured with a magnetic lock and is released by the individual wanting to exit by pushing on the exit bar. Pushing on the bar initiates an irreversible delay time of up to 15 seconds (special dispensation may allow 30 seconds). During the delay before releasing the lock, a local audio alert sounds and depending on the application, a remote alarm may also activate. At the end of the delay, the lock releases and the local audio alert is turned off. It remains unlocked until a reset is invoked; the reset method may vary depending on the applied code or the AHJ.

In all instances, signage is required to indicate that those wishing to exit should keep pushing on the door or exit device and that the door will open in 15 seconds. These signage kits are available as options for the Series 800 Controller.

Note:
The difference between a listed system and a listed component is that all devices used for the delayed exit application have been tested as a working system whereas component listings are individually tested devices grouped together to create the application, and are individually listed.

Section 2.3

Delayed Exit Functions

Codes for delayed exit vary to meet the requirements of the different jurisdictions which Series 800 Controllers are programmed to respond to, they are:

1. NFPA 101 - SPECIAL LOCKING ARRANGEMENTS
2. SBC - STANDARD BUILDING CODE
3. UBC - UNIFORM BUILDING CODE
4. BOCA - BUILDING OFFICIALS CODE ADMINISTRATORS
5. NBC - NATIONAL BUILDING CODE of CANADA

The door is locked secure by a **magnetic lock,** as the locking device must be of a fail-safe design in that it requires power to lock. The exit sequence is initiated by pushing on the exit device, or devices if it is a pair of doors, connected to Exit A, terminals 40/41 or Exit B, terminals 42/43. The switch can be either NC or NO as the controller can be configured to accept either type. These inputs are the only triggers for delayed exit operations.

A **nuisance feature** of 1, 2 or 3 seconds is available and the amount of time and its use is governed by the code selected or the user and use of this feature may be overruled by the AHJ locally. During the nuisance cycle the audio alert connected to relay R3 designated to be the local alarm will Pulse as opposed to remaining steady **On**. Its use is to indicate to whomever is pushing on the bar that they are initiating the release system. If they remove themselves from the bar before the nuisance time selected expires, the audio alert will turn off and the system will be ready for the next initiate. If on the other hand an exit is demanded, the individual will maintain pressure on the bar and after the nuisance time has expired, the audio alert will **sound steady** and the **IRREVOCABLE** release countdown will initiate. At the end of the count, normally 15 seconds in total, the lock will release.

The lock will remain unlocked (without power) until manually re-locked by a **reset device.** All codes, other than BOCA or SBC, will require a **Momentary** type switch connected to input terminals 48/49. Generally a key switch is employed but any momentary switch associated to a manual function is usually acceptable as long as it is in a position whereby only an authorized person can perform the reset function. The exception is a Door Position Switch (DPS) which is NOT ACCEPTABLE as a reset except that the DPS is a significant and unique part of the BOCA and SBC codes.
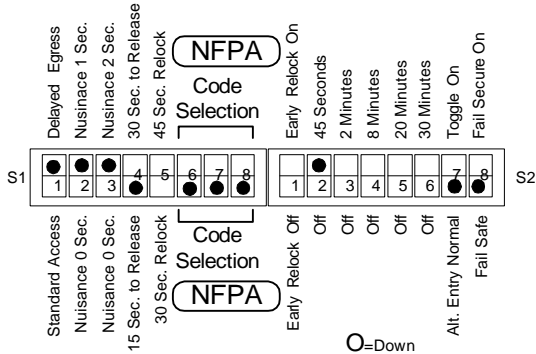
The local alarm relay (R3) is designated by the program to provide control over the audio alert and is MANDATORY by CODE to indicate to the user that the system has activated. The remote alarm relay (R2) is not a code requirement but is provided to insure that an alarm is continuous and that a response is necessary by an attendant as the local alarm will turn off when the lock is released. All relays are energized on power-up and de-energize when triggered.

Briefly the code applications when selected by dipswitch selection using dipswitch S1, the operational characteristics are as follows: *Ref: setup drawings on pages 25 and 26*
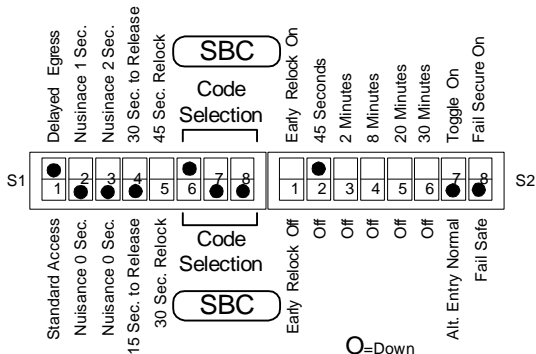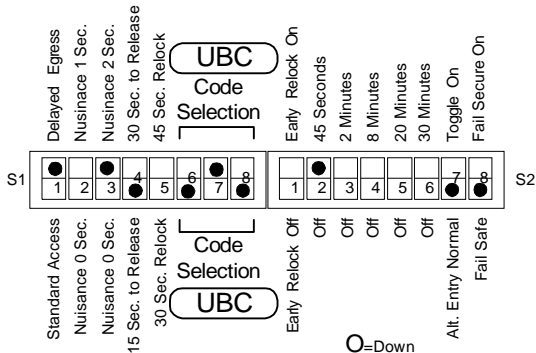
1. NFPA - Nuisance Delay ………. up to 3 seconds permitted
Release Delay ……….. 15 seconds total or with 30 seconds by approval from AHJ
Re-locking …………….. manual switch, cannot be a switch located on or triggered by the movement of the door

Delayed Egress / Nusinace 1 Sec. / Nusinace 2 Sec. / 30 Sec. to Release / 45 Sec. Relock / **NFPA** Code Selection / Early Relock On / 45 Seconds / 2 Minutes / 8 Minutes / 20 Minutes / 30 Minutes / Toggle On / Fail Secure On

S1 1 2 3 4 5 6 7 8   1 2 3 4 5 6 7 8 S2

Standard Access / Nuisance 0 Sec. / Nuisance 0 Sec. / 15 Sec. to Release / 30 Sec. Relock / Code Selection **NFPA** / Early Relock Off / Off / Off / Off / Off / Off / Alt. Entry Normal / Fail Safe

O=Down

---

2. SBC Nuisance Delay ………. not allowed
Release Delay ……….. 15 seconds or with 30 seconds by approval from AHJ
Re-locking …………….. reset must occur only on opening, must be a switch located on or triggered by the movement of the door

Delayed Egress / Nusinace 1 Sec. / Nusinace 2 Sec. / 30 Sec. to Release / 45 Sec. Relock / **SBC** Code Selection / Early Relock On / 45 Seconds / 8 Minutes / 20 Minutes / 30 Minutes / Toggle On / Fail Secure On

S1 1 2 3 4 5 6 7 8   1 2 3 4 5 6 7 8 S2

Standard Access / Nuisance 0 Sec. / Nuisance 0 Sec. / 15 Sec. to Release / 30 Sec. Relock / Code Selection **SBC** / Early Relock Off / Off / Off / Off / Off / Alt. Entry Normal / Fail Safe

O=Down

---

3. UBC Nuisance Delay ………. is required and must be set to 2 seconds
Release Delay ……….. 15 seconds total without options
Re-locking …………….. manual switch, cannot be a switch located on or triggered by the movement of the door

Delayed Egress / Nusinace 1 Sec. / Nusinace 2 Sec. / 30 Sec. to Release / 45 Sec. Relock / **UBC** Code Selection / Early Relock On / 45 Seconds / 2 Minutes / 8 Minutes / 20 Minutes / 30 Minutes / Toggle On / Fail Secure On

S1 1 2 3 4 5 6 7 8   1 2 3 4 5 6 7 8 S2

Standard Access / Nuisance 0 Sec. / Nuisance 0 Sec. / 15 Sec. to Release / 30 Sec. Relock / Code Selection **UBC** / Early Relock Off / Off / Off / Off / Off / Off / Alt. Entry Normal / Fail Safe
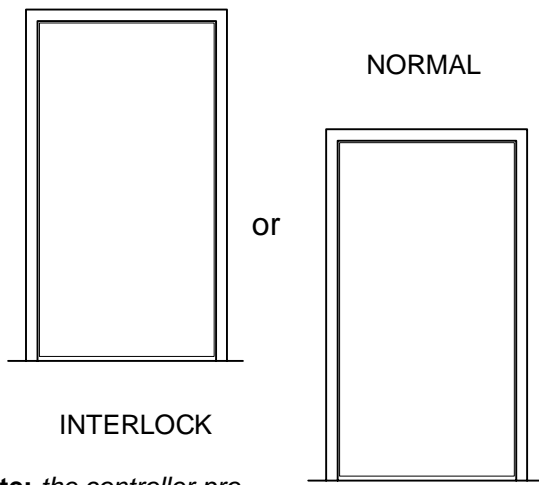
O=Down

4. **BOCA**   Nuisance Delay ………. is required and must be set at 1 second
Release Delay ……….. 15 seconds total or with 30 seconds by approval from AHJ
Re-locking ……………... must be a switch (DPS) located on or triggered by the movement of the door. The door opening and again closing triggers special timing functions. After the lock releases and the door is opened, it has preset a timer. When the door now closes, a "re-lock delay" count of 30 seconds begins. If the door is not cycled again during this 30-second period, it will lock secure. The re-locking will only occur when the door has been left undisturbed for 30 seconds after the controller has received a door-closed signal from the door position switch. The AHJ locally may extend the re-lock delay time to 45 seconds.
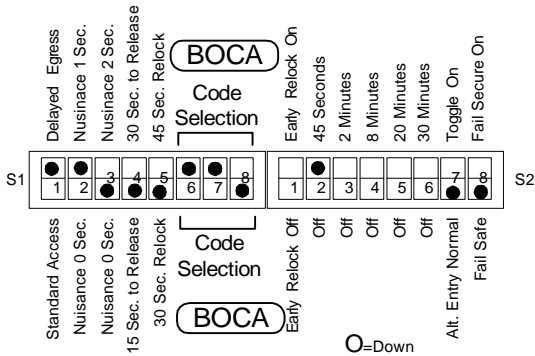
5. **NBC**   Nuisance Delay ………. up to 3 seconds permitted
Canada   Release Delay ……….. 15 seconds total or with 30 seconds by approval from AHJ
Re-locking ……………... manual switch, cannot be a switch located on or triggered by the movement of the door
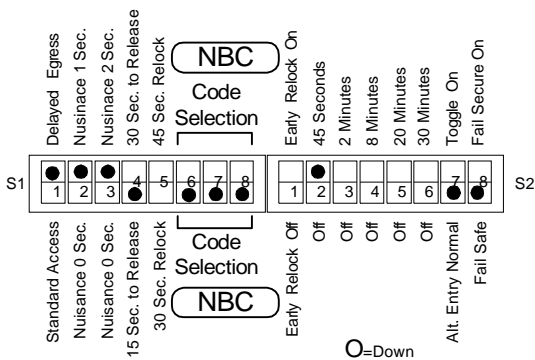
Note: *power supplied to the controller is often a part of the code specific application and should be checked locally if battery back-up is a consideration for your application. The Series 800 Controller incorporates a fire drop-out circuit across terminals 3/4 that will remove power from all relays in the event of a fire and a separate manual fire re-lock switch may be employed on terminals 1/2 to restrict activation of the lock system by unauthorized users. If batteries are employed, the fire drop-out also removes battery power. Ref: Electrical Specifications 4.4 for more information about the fire relay operation.*

2.4 CONFIGURATION INSTRUCTIONS for 2-DOOR CONTROL OPERATIONS

NORMAL

or

INTERLOCK

Note: *the controller program will not allow "delayed exit" operations to become operational when 2-Door mode is active.*

Because the Series 800 Controller will provide interlock operations, it is, by design, able to control two different openings with independent release and timing functions. The grant time for release selected is applicable to both doors. If one door is triggered and then the other is triggered, at a different time, while the first cycle is active, they will each be given their full count independently of each other. There are some minor automatic internal changes as a result of invoking the 2-Door mode and they affect input **triggers**, **door position, and bolt position inputs,** as well as the external **Led drivers**. All alarm output is limited to operations of relay R3 and a "door ajar" alarm for instance will not be identified as coming from door A or B. Attendance to the door will be required to confirm which door is open.

Configuring the controller into 2-Door mode **Normal,** so designated to differentiate from **Interlock** mode, is accomplished by changing dip settings in block S4. Slide the switches #3,4 & 5 to On.
Ref: Figure DRW 12

DRW– 12

To invoke 2-Door mode, refer to dip block S4, dipswitches 3, 4 and 5 are all positioned to On.

Relay R2 is now configured to be the 2nd door B. Relay R1 is door A.

The DPS input 50/51 and output 7/8 are positioned as door A.
The BPS input 52/53 and output 5/6 are positioned as door B.

Because the controller has only one Alternate input in standard mode, once 2-Door mode is invoked, an internal program **repositions the Momentary Entry input**, terminals 44/45 to conform to the same rules of operation associated to the Alternate Entry input, terminals 46/47. Input 44/45 controls relay R1, door A and input 46/47 controls relay R2, door B. When locks are connected to the relays, both will then independently respond to Maintained switch changes for On / Off control as can be provided by a manual key switch or a time clock. These inputs are also the preferred location for integration of card reader relay output signals to release the lock from a valid card read for entry or exit. The reason being that these types of devices have a grant for release time available within their programming capabilities and will make the decision as to when, and for how long, the locking mechanism will be released.
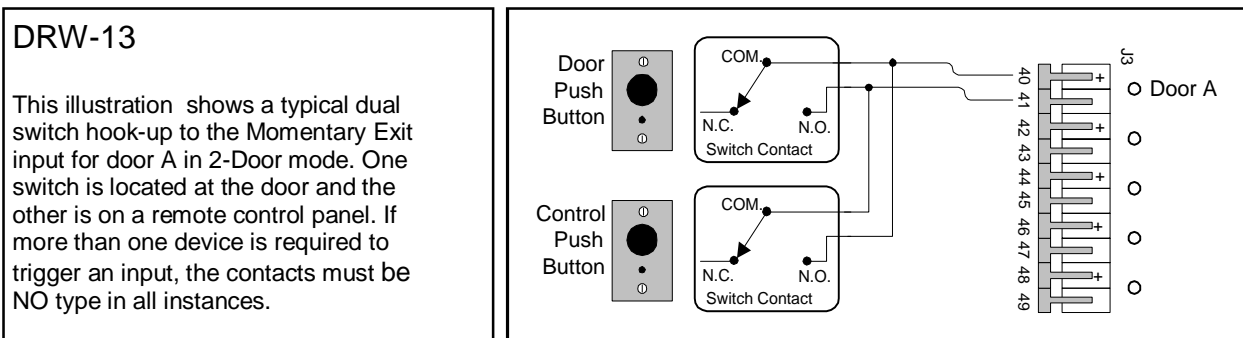*Ref: Maximizing Input and Output Device Control 3.0.*

2-Door Operations continued ……

If … toggle mode is invoked, each door will respond independently as detailed above but the switches connected to inputs 44/45 & 46/47 must be Momentary type as opposed to Maintained (Alternate) type. *See Ref: Toggle mode input and output characteristics - Section 1.1*

When 2-Door mode is configured, the lock relay **R1** becomes **Door "A"** and is now only associated to the switch activity of the DPS connected to terminals 50 and 51. The Momentary Exit input 40/41 is now only associated to door "A". If a timed entry is required as part of the application, the entry switch will also have to be connected to terminals 40 and 41. The Led driver output 54 and 55 that indicates activity from inputs 40/41 mirrors the timer related operations of door "A".

The auxiliary relay **R2** becomes **Door "B"** and is **only** associated to the activity of the BPS switch connected to terminals 52 and 53. The Momentary Exit input 42/43 is now only associated to door "B" and if a timed entry is required as part of the application, the entry will also have to be connected to terminals 42 and 43. The Led driver output (originally Momentary Entry) 56 and 57 that indicates activity from inputs 42/43 mirrors the timer related operations of door "B".

Note: *when two switches are to be connected to the same input, they will both have to be NO type and connected in parallel and then across the input.*

DRW-13

This illustration shows a typical dual switch hook-up to the Momentary Exit input for door A in 2-Door mode. One switch is located at the door and the other is on a remote control panel. If more than one device is required to trigger an input, the contacts must be NO type in all instances.

2.5 CONFIGURATION INSTRUCTIONS for INTERLOCK CONTROL OPERATIONS

An interlock, in simple terms, insures that one opening cannot be accessed or exited from if the other is in an unsecured state which usually means that the other door is open. If there is a risk of tamper or other serendipitous attempts at breaching the security of the interlock, more than one method of checking status should be a primary concern. The most effective means of providing reliable status information to the controller is to use two sensing switches for each door leaf associated to the interlock operation. One switch to monitor the door position (DPS) is connected in series with a bond sensing device switch (BPS), if a magnetic lock is being used, or in series with a latch bolt switch (BPS), if a bolt lock is being employed. With the two sensing switch applications in place a would-be interloper would have to mask two separate devices at the same moment in order not to initiate an alarm.

The Series 800 Controller will invoke interlocking control between two openings without relying on door position switches, bolt position switches or any other external applications of wire or controlling devices to insure that the interlock operation is not breached. Control of the interlock is initiated by the first input from either opening which can be provided from an initiating device connected to input terminals 40/41, door A or 42/43, door B. If, at the time of the input, the other door is not reporting secure, the attempted input is ignored. A reasonable grant time should be programmed to allow for a normal opening and closing cycle.
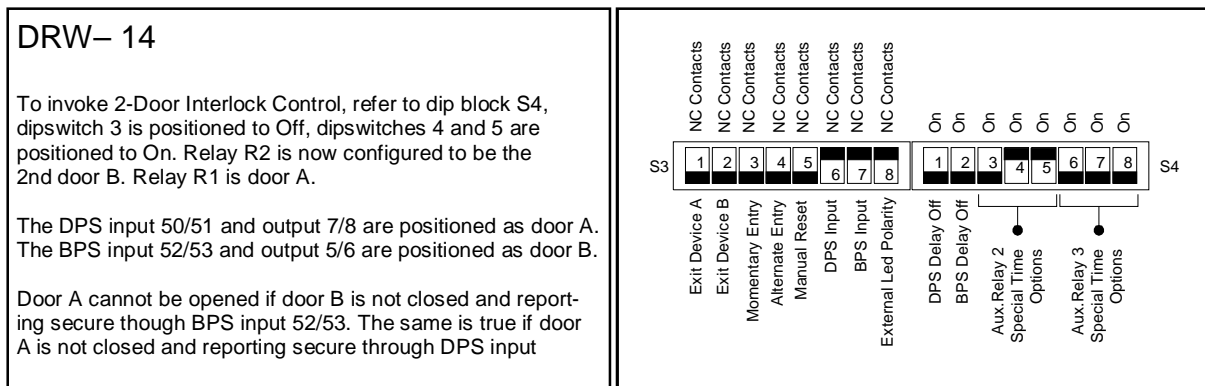
2-Door Interlock continued ……...

If, after the grant time has expired, and the door is not closed, and confirmed secure by the DPS/BPS, relay R3 will initiate a "door ajar" alarm output. The grant time can be long to respond to the needs of ADA requirements, as the DPS on closing, after opening, will reset the grant timer to zero. The Alternate switch inputs, terminals 44/45 and 46/47, are not normally employed in interlock controls except to act as an override by an individual in authority or if the interlock is only active for certain periods. The Series 800 Controller will allow for the use of many activating devices in various scenarios that will likely accommodate the needs of all users.

The controller is equally divided between the two openings being controlled as is detailed in the above section "2-Door Function". The dipswitch setting is different and is detailed as follows:
Note: *if as a user or installer, you are not familiar with the operations of the* Series 800 Controller *it is suggested that you become familiar with 2-Door mode in detail before commencing installation or operation*
        of the interlock mode.

DRW– 14

To invoke 2-Door Interlock Control, refer to dip block S4, dipswitch 3 is positioned to Off, dipswitches 4 and 5 are positioned to On. Relay R2 is now configured to be the 2nd door B. Relay R1 is door A.

The DPS input 50/51 and output 7/8 are positioned as door A. The BPS input 52/53 and output 5/6 are positioned as door B.

Door A cannot be opened if door B is not closed and reporting secure though BPS input 52/53. The same is true if door A is not closed and reporting secure through DPS input

To configure the controller into 2-Door **Interlock** mode change dip settings in block S4. Slide the switch #3 to Off and #4 & 5 to On. *See Ref: DRW 14*

If …. more than two openings are to be controlled with interlock operation - *Ref: Maximizing Input and Output Device Control for extended features for Multiple point release inputs 3.6*

Toggle mode in 2-Door operations is a setting that effects the operation of input 44/45 and 46/47, the On / Off control over the lock relay(s) R1 and R2. Toggle action is a feature most commonly employed when a lock has to be controlled from more than one point. An example of this would be a local On/Off switch at the opening and a control panel doing the same function from a Control Room. If not handled as toggle activity, they would not be able to pass control back and forth to each other so that both switches always remain active. Toggle mode requires that **both switches be NO** (Normal Open) **Momentary type connected in parallel and then connected across the input.** Each successive input changes the state of the relay from its previous position.

Toggle operations can be implemented with 2-Door operations and Interlock control. The Momentary inputs are not effected by toggle operations and perform their respective timing operations with or without Toggle mode being selected.
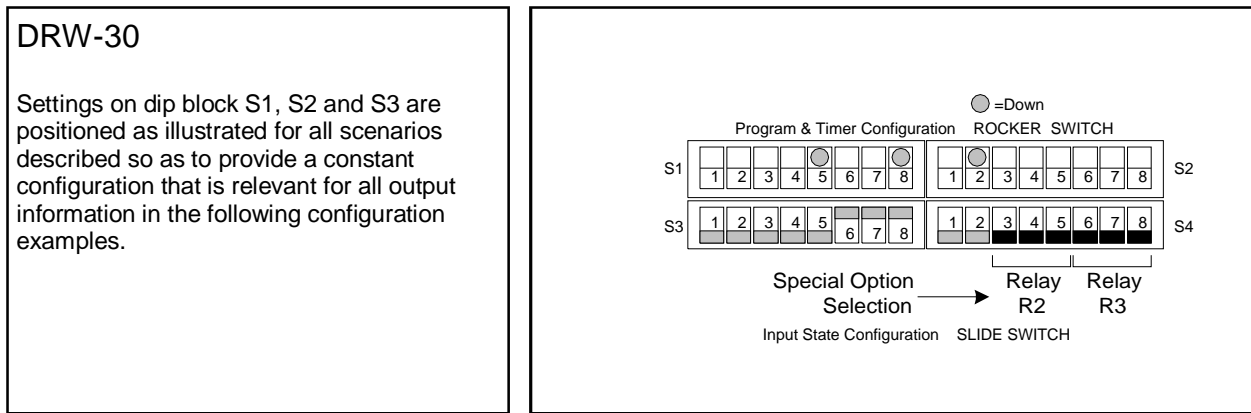*Ref: Maximizing Input and Output device control - Multiple point release inputs 3.5*

Section 3.0
Maximizing Input and Output

Complex integration of multiple devices at the opening
and monitoring systems are possible with the standard Series 800 Controller.
Section 3.0 offers advanced programming opportunities to enhance time
and linking of relays in all modes.

3.0   Maximizing Input and Output Device Control for complex integration of external
       components.   PAGE

DRW-30

Settings on dip block S1, S2 and S3 are
positioned as illustrated for all scenarios
described so as to provide a constant
configuration that is relevant for all output
information in the following configuration
examples.

Relay R2 - Dip Block S4 / Special Timing Options

Assumptions -   Controller lock relays set for fail-safe operation.
                      Grant for lock release selected @ 8 seconds, dip block S1, dipswitch #5 On.
                      Extended time selected @ 45 seconds, dip block S2, dipswitch #2 On.
                      Door is cycled, if not cycled, grant time de-energizes R1 for 8 sec., then relock.

Note: Any combination of time slots can be selected from dip blocks S1 and S2.
             Relays are always energized on power up.
             Relay **contact illustrations**, Normal NO & NC, are relays **without** power.
             Triggers (trg.) are inputs - terminals 40 through 53.

Mixing manual jumper link switching with dip link switching will cause undocumented activity to occur.

3.1 Advanced Time Control and Effects to Output relays R1, R2 and R3

The demands at the opening are as dynamic as any production can be with many directors as opposed to one. There could be more players, but, it is usually the case whereby the opening design, the building code, the fire code, ADA and just how much hardware attached to the opening is necessary to obtain the operations desired for the intended use. Each of the cast of characters has to be seamlessly worked into the production. Once all of this information is correlated, a sequence of operation can be written. Abbreviated and point format is the most informative as well as the easiest to mark off when identified and positioned.

The Series 800 Controller, offers a simple application of relay logic that is field selected to perform input and output operations necessary for access management of low voltage electric devices controlled by switches. The logic is complimented by programmable timers that will activate relays to On or Off at the right moment, for the right amount of time, to orchestrate a series of events. For example, releasing a lock and enabling the auto-opener requires a short delay between two operations and a trigger pulse to activate the operator. Not complicated, but, when you add retractor panic devices, there is now a third operation. Now a simultaneous operation has to occur between the lock release and then again between the panic retraction, and then the auto-opener. The tricky part is holding the panics retracted without cycling the operator and maintaining control over the outside push pad for day use. *A caveat is also attached that requires the auto-opener not to activate if the panic bolt is not retracted or the lock is not unlocked.*

External alarm reporting output to most monitoring systems may be a dry contact closure opening to signal the event, but many applications of alarm are made up from visual and audio alerts that require power. Annunciation panels, door ajar alerts and remote control stations are all devices that require power to activate. In order to provide a visual or audio indication that is unique to the type of alarm the controller can be set to provide **oscillating On/Off output** at one second intervals as opposed to a steady On. In order to trigger many external systems or electric motor devices, a **pulse output** is desired as opposed to a steady on which in some instances can effect the operations of the external equipment. When this pulse signal is received, it is also important so that the sequence of operation is consistent with operations of the opening.
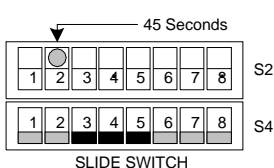
This configurable programming is typical of the operations imbedded into the Series 800 Controller. There are many scenarios and device applications coupled to user situations that we have provided for in Section 3.0. If you are in need of a particular cycle sequence of operation that does not seem to be apparent, contact the factory **BY FAX** with a description of your sequence of operation as we may be able to offer a quick solution using the standard RLB800 controller. Don't forget to add your voice # so we can call you.

Relay R2 - Dip Block S4 / Special Timing Options

DRW 31 – NORMAL   **This is the DEFAULT SETTING for Auxiliary Relay R2**

Option 1	Mom. trg.	R1 de-energized - will reset on DPS, or
		R3 de-energized after 8 sec. "door ajar" alarm - steady On, then

R1 energized when R2 de-energized

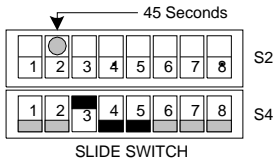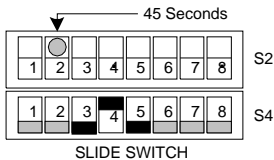R2 and R3 energized when DPS close

Manual reset selected to On

R3 de-energized, if DPS closed within 45 sec. relay will not latch, or
R3 de-energized past 45 sec, , then
R2 de-energized, R2 and R3 latched, waiting for manual reset

45 Seconds

S2

S4

SLIDE SWITCH

Relay R2 - S4 Special Options continued ……….

DRW-32

This function will set the Relay R2 to 1 second oscillation

Option 2   Mom. trg.   R1 de-energized - will reset on DPS or
                    R3 de-energized after 8 sec. "door ajar" alarm - steady On, then
                    R2 de-energized after 45 sec. "remote" alarm" - pulse On/Off , I sec. intervals, then
                    R1 energized when R2 de-energized
                    R2 and R3 energized when DPS close

Manual reset selected to On

R3 de-energized, if DPS closed within 45 sec. / relay will not latch or
R3 de-energized past 45 sec, , then
R2 de-energized, R2 and R3 latched, waiting for manual reset

45 Seconds

1 2 3 4 5 6 7 8 S2

1 2 3 4 5 6 7 8 S4

SLIDE SWITCH

DRW-33

This function will set the Relay R2 to 1/4 second pulse

Option 3   Mom trg.   R1 de-energized - will reset on DPS or
                    R3 de-energized after 8 sec. "door ajar" alarm - steady On, then
       R2 de-energized after 45 sec. "remote" alarm - pulse On/Off , for 1/4 sec., then
                    R1 energized when R2 de-energized
                    R2 and R3 energized when DPS close

Manual reset selected to On

45 Seconds

1 2 3 4 5 6 7 8 S2

R3 de-energized, if DPS closed within 45 sec. / relay will not latch or
R3 de-energized past 45 sec, , then
R2 de-energized, R2 and R3 latched, waiting for manual reset

1 2 3 4 5 6 7 8 S4

SLIDE SWITCH

DRW-34

This function will set a software link connection between R2 to R1

Option 4   Mom trg.   R1 & R2 both de-energize - both will reset on DPS close
           R3 de-energized after 8 sec., remains de-energized and will reset only on DPS close
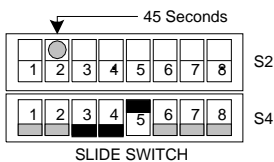   R1 & R2 energize after 45 sec.

Manual reset selected to On

45 Seconds

1 2 3 4 5 6 7 8 S2
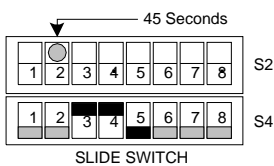
R3 de-energized after 8 sec. and then after 45 seconds R1 & R2 reset - R3 latches
R3 waiting for manual reset

1 2 3 4 5 6 7 8 S4

Alt. trg.   R2 follows R1, both are de-energized

SLIDE SWITCH

DRW – 35

This function hold R2 and R3 active [de-energized] until a DPS reset occurs

Option 5   Mom trg.   R1 & R2 both de-energize - both will reset on DPS close
           R3 de-energized after 8 sec., remains de-energized and will reset only on DPS close
                    R1 energizes after 45 sec. / R2 remains de-energized until DPS closed

Manual reset selected to On

45 Seconds

1 2 3 4 5 6 7 8 S2

R3 de-energized after 8 sec., and after 45 seconds R1 reset s- R3 latches / R2 is still de-energized
R2 energizes on DPS close - R3 remains latched waiting for manual reset

1 2 3 4 5 6 7 8 S4

Alt.   R2 follows R1- both are de-energized
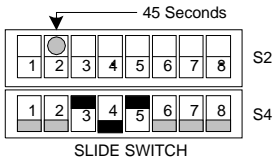
SLIDE SWITCH

Alt.= Alternate Mode Terminals

Relay R2 - S4 Special Options continued ……...

DRW-36   **This function increases the Jumper set Delay time for R2 from 1/2 sec. To 1 Sec.**

Option 6

This option is provided to increase the time delay from 1/2 sec. to 1sec. for the delay invoked by the jumper link group located on the center section of the controller circuit board. Markings DLY / RLY2 / RLY3 are located beside the jumpers. When used for delay purposes without the S4 Option #6, the delay period is 1/2 sec between the linked relays. When Option #6 is invoked, the delay increases to 1 second.

45 Seconds

S2 [1 2 3 4 5 6 7 8]
S4 [1 2 3 4 5 6 7 8]
SLIDE SWITCH

Option 7   2-Door Interlock   Ref: Section 2.5

Option 8   2-Door Normal   Ref: Section 2.4

Relay R3 - Dip Block S4 / Special Timing Options

DRW-38 – NORMAL   **This is the DEFAULT SETTING for Auxiliary Relay R3**

Option 1   Mom. trg.   R1 de-energized - will reset on DPS, or
R3 de-energized after 8 sec. "door ajar" alarm - steady On, then
R2 de-energized after 45 sec. "remote" alarm - steady On, then
R1 energized when R2 de-energized
R2 and R3 energized when DPS close

45 Seconds

S2 [1 2 3 4 5 6 7 8]   Manual reset selected to On
S4 [1 2 3 4 5 6 7 8]
SLIDE SWITCH
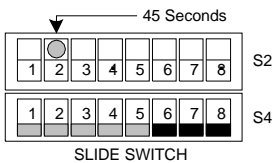
R3 de-energized, if DPS closed within 45 sec. / relay will not latch, or
R3 de-energized past 45 sec, , then
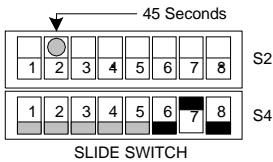R2 de-energized, R2 and R3 latched, waiting for manual reset

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DRW-39   **This function will set the relay R3 to 1 second oscillation**

Option 2   Mom. trg.   R1 de-energized - will reset on DPS or
R3 de-energized after 8 sec. "door ajar" alarm - pulse On/Off, <u>I sec. intervals</u>, then
R2 de-energized after 45 sec. "remote" alarm" - steady On, then
R1 energized when R2 de-energized
R2 and R3 energized when DPS close

45 Seconds

S2 [1 2 3 4 5 6 7 8]   Manual reset selected to On
S4 [1 2 3 4 5 6 7 8]
SLIDE SWITCH

R3 de-energized, if DPS closed within 45 sec. / relay will not latch or
R3 de-energized past 45 sec, , then
R2 de-energized, R2 and R3 latched, waiting for manual reset

Alt.= Alternate Mode Terminals
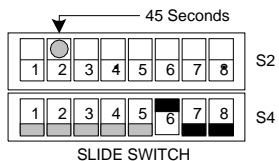
Relay R3 - S4 Special Options continued ……..

DRW-40   This function will set the Relay R3 to only pulse for 1/4 second

Option 3   Mom trg.   R1 de-energized - will reset on DPS, or
R3 de-energized after 8 sec. "door ajar" alarm - pulse On/Off, <u>for 1/4 sec</u>, then
R2 de-energized after 45 sec. "<u>remote</u>" alarm - steady On, then
R1 energized when R2 de-energized
R2 energized when DPS close

Manual reset selected to On

R2 de-energized, R2 latched, waiting for manual reset

SLIDE SWITCH

DRW-41   This function will set a software link connection between R3 to R1

Option 4   Mom trg.   R1 & R3 both de-energize - both will reset on DPS close
R2 de-energized after 45 sec., remains de-energized and will reset only on DPS close
<u>R1 & R3 energize after 45 sec.</u>
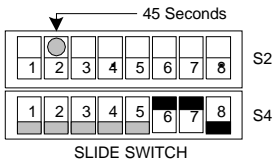
Manual reset selected to On

R2 de-energized after 45 sec., R1 & R3 reset - R2 latches
R2 waiting for manual reset

Alt. trg.   R3 follows R1, both are de-energized

Note: Option 4 is not a viable selection when 2-Door mode has been selected.
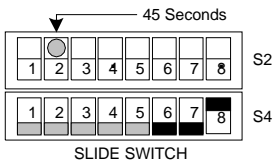
SLIDE SWITCH

DRW-42   This function hold R2 and R3 active [de-energized] until a DPS reset occurs

Option 5   Mom trg.   R1 & R3 both de-energize - both will reset on DPS close
R2 de-energized after 45 sec., remains de-energized and will reset only on DPS close
R1 energizes after 45 sec. / R3 remains de-energized until DPS closes

Manual reset selected to On

R2 de-energized after 45 sec., R1 reset s- R2 latches / R3 is still de-energized
R3 energizes on DPS close - R2 remains latched waiting for manual reset

Alt.   R3 follows R1- both are de-energized

Note: When 2-Door mode enabled, DPS (50/51) reset for R1, BPS (52/53) reset for R3, also Mom. trigger for either door will de-energize R3. Alt. On/Off for either door will de-energize/energized R3.

SLIDE SWITCH

DRW-43   This function increases the Jumper set Delay time for R3 from 1/2 sec. To 1 Sec.

Option 6   This option is provided to increase the time delay from 1/2 sec. to 1sec. for the delay invoked by the jumper link group located on the center section of the controller circuit board. Markings DLY / RLY2 / RLY3 are located beside the jumpers. When used for delay purposes without the S4 Option #6, the delay period is 1/2 sec between the linked relays. When Option #6 is invoked, the delay increases to 1 second.
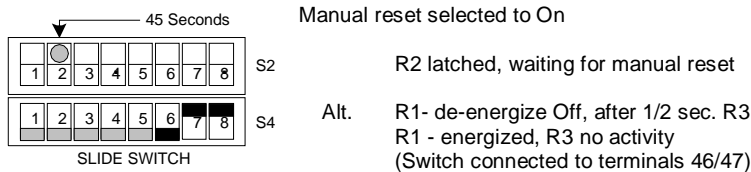
SLIDE SWITCH

Alt.= Alternate Mode Terminals
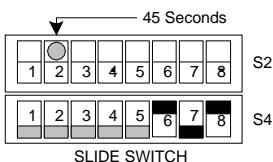
Relay R3 - S4 Special Options continued ......

DRW-44   **This function triggers R3 after R1 with a delay & only activates R3 for 1/4 sec.**

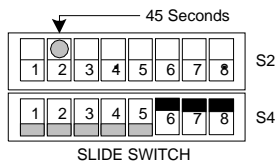**Option 7**   Mom trg.   R1 de-energized, 1/2 sec. delay, then
                                            R3 de-energized - pulse On/Off, for 1/4 sec, then
                                            R2 de-energized after 45 sec. "remote" alarm - steady On, then
                   R1 energized when R2 de-energized
                                            R2 energized when DPS close

                   Manual reset selected to On

                                            R2 latched, waiting for manual reset

                                  Alt.   R1- de-energize Off, after 1/2 sec. R3 will pulse On/Off, for 1/4 sec.
                                            R1 - energized, R3 no activity
                                            (Switch connected to terminals 46/47)

DRW-45

Option 8   Future

3.2 Manual Jumper Link Settings for Relays

Previously we have discussed dipswitch settings, which are software based program options that are all located on dip blocks S1, S2, S3 and S4. There are a number of hard switch options that are controlling power, actual relay activity, battery charging or the routing of power either from a source or as an output from the controller board. Power and battery charging is discussed in Section 4.0. This section will describe the jumper links that have effect on output relays.

Linking Relays R1, R2 and R3 to Each Other

A set of Jumper Links have been placed just above dipswitch S1 that control linking operations for the designated lock relay R1 and the two auxiliary relays R2 and R3. There are many diverse reasons for linking relays to each other and in many instances it is a judgement call relative to the hook-up plan conceived or it may be called for because of the quantity of devices that must either turn On or turn Off from a single input when it is invoked. Reference DRW 46 for illustrated examples of settings.

Disabling Relays R2 and R3

There are instances where relays R2 and R3 are required to be inactive, except for power failure or a fire shutdown. An example would be an electric strike or retractor panic device, both as fail-secure devices requiring power to Unlock. Both being held in the UNlocked position (relay energized) until an emergency situation occurs at the controller. The door in this example is free swinging as a push/pull application until the controller goes to a shutdown mode, either by loss of power or fire system activation. The door closes and is then latched by the bolts, egress is free, but access is denied. The latch bolt for the strike application can be retracted manually by inside activity acceptable to the AHJ.

Alt.= Alternate Mode Terminals

To expand on this application, a discriminating device such as a card reader with a magnetic lock can be applied to remove the free entry/exit status and add authorized entry and egress. The magnetic lock fails safe and egress is always available by the panic bar. Entry during the fire or power down is usually a key override in the panic or lock used with the electric strike. Further expansion with the addition of an auto-opener or emergency card access are other options the Series 800 Controller can accommodate.

To disable relays, reposition the jumper links for R2 and R3 to a single pin position. The relays are now inactive to program instruction. Maintaining the single pin location insures the pin is available to enable the relays if the sequence of operation changes.

Linking Relay R1 to R2 and R3

Drawing DRW-46

This drawing Illustrates a common application for a door with a latching bolt and a need for push /pull operations during a designated time. Activation of the door is by the auto-operator from a presence sensor or push pad.

In the event of a power failure or fire, the magnetic lock will fail open and the electric strike will fail secure. Entry will be denied but exit will be available at all
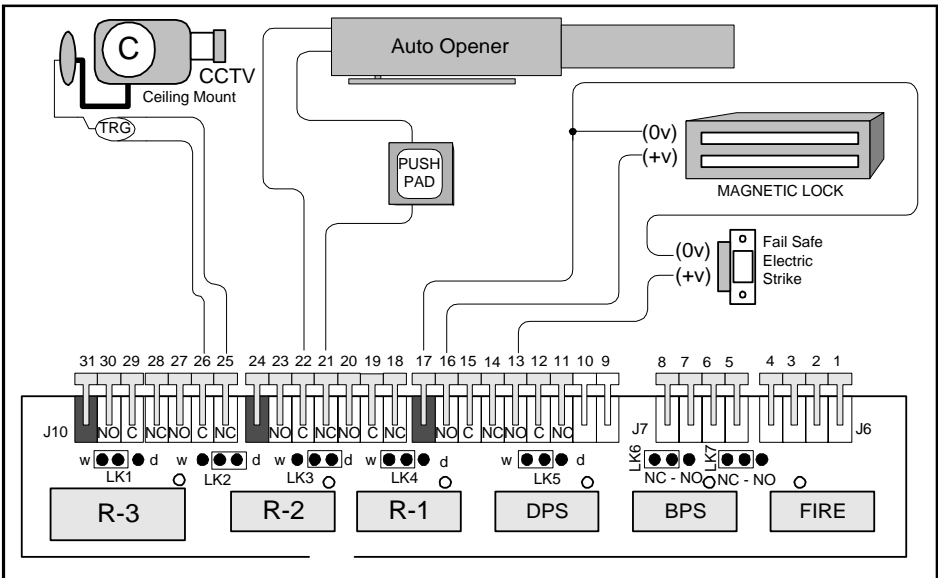

By positioning the jumper R2 to On, a delay has been set to occur between the activation of R1 [lock/strike] and R2 [auto-opener]. This delay is set by the program to be 1/2 sec. It can be increased to 1 sec. by selection of a dip setting on dipswitch S4.
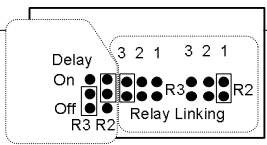
By positioning the R2 jumper to position 1, relay R2 is now linked to the operation of relay R1.
R3 is controlling the camera and if the door is held open beyond the grant period selected it will activate to bring a picture to the monitor.

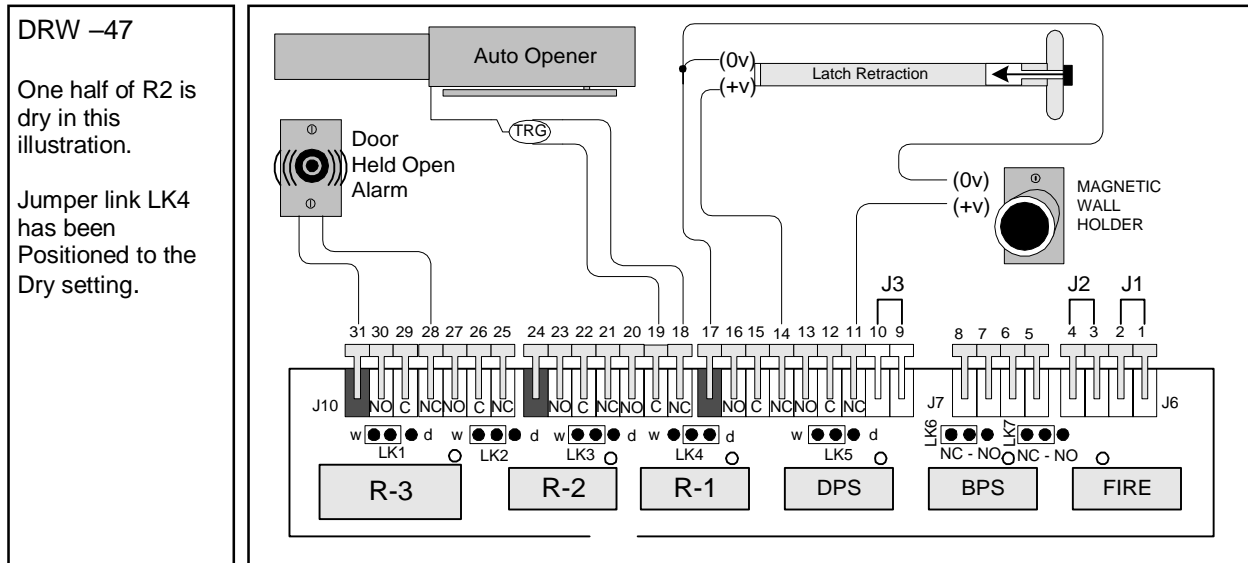In this setting the delay time sequence is not active.
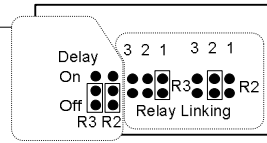
By positioning the R3 jumper to position 1, relay R3 is now linked to the operation of relay R1. R3 is normally the 1st relay to report an alarm. Using this positioning causes R2 to report alarm output.

It is important to note that the manual feature of linking is that relay R1 is the constant and the activity of relays R2 and R3 occur as a result of activity associated to R1. Reverse operations whereby a selection expecting the activity of relay R3 to trigger R2 as a result of R1 activity when R3 is linked to R1 cannot be accomplished. Use the software linking modes – Ref: Advanced Timing Operations 3.1

Output Relays R3 and R2 are double pole double throw (DPDT) relays and are labeled as auxiliary relays because they are not dedicated to a single use. Each relay has two sets of poles that are individually controlled by jumper links. The jumper links that will dry R3 output from board selected voltage (12 or 24VDC) to zero volts are LK1 and LK2. Relay R2 poles are controlled by jumper links LK3 and LK4. *Ref: DRW-47*

Output Relay R1 - this is the designated lock control relay and it is a DPDT relay with one set of jumper link settings available for wet or dry operation. Jumper link LK5 selects for both sets of poles. Ref: DRW-47

DRW –47

One half of R2 is dry in this illustration.

Jumper link LK4 has been Positioned to the Dry setting.

DPS and BPS Output Relays - these two relays are designated as the output signal information that is usually picked up by monitoring equipment that needs to receive dry input status reporting. But since the controller is often employed as a control hub for doors reporting to panels that have Led's and audio alerts that have to be powered in order to report door status, the relays are provided with jumper link switches. The jumper links will switch between a NO and NC status so that a choice of "power On" or "power Off" can be employed at the control panel when activity is being monitored. A jumper from the power tap terminal 36 applies power. If 9VDC is a requirement for this application, the power tap is a separate set of plug terminals. *Ref: page 2 diagram for location of 9VDC tap.*

3.3 Integration to External Monitoring and Control Systems

There are as many controlling variations as there are systems and devices connecting to them. Rather than create endless scenarios, this section will relate to the primary control components for input and output activity that are common to all electronic access systems. The RLB 800 controller is a stand-alone electronic system very similar to a Programmable Logic Controller (PLC). The difference being that the PLC has an operating system imbedded waiting for an application program that has to be created (software), to enable the integration process, while the Series 800 Controller has an application program imbedded (firmware) that is directly relating to opening management of devices associated to access and egress.

Section 3.3

The RLB 800 controller accepts input information from external devices or system output signal voltage. Monitoring is a signal output from the controller relay DPS or BPS that is normally taken from terminals 5/6 and 7/8 which are configured as dry (without voltage), as most intrusion or access systems are looking for this type of signal to reflect door position status. Repositioning jumper links to provide this same type of signal can dry out relays R1, R2 and R3, or a portion of R2 and R3.
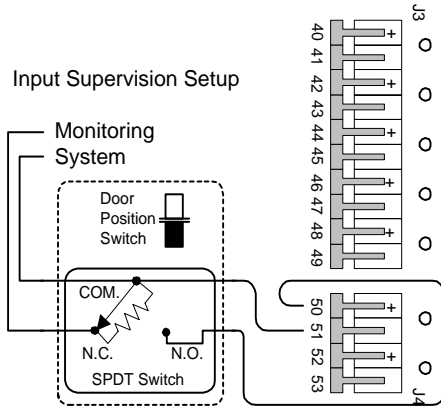
If … the output signal from the external device connected is wet (with voltage), it is now polarity selective and the positive (+V) must be connected to either terminal 50 or 52, the ground would be connected to 51 or 53. Some signal outputs, commonly referred to as board level TTL output, will have one positive (+V) wire that is the output driver and it can be connected to any of the designated inputs (orange input terminals) on the controller. The inputs are open collectors and will trigger from a transistor output that takes the current to zero volts. *Ref: Input Characteristics, Electrical Specification Section 4.4*

If … the monitoring system is providing supervision over the input circuits, it is necessary for the device connected to the

input to have a SPDT switch whereby one half is used to signal the controller. The other half has a resistor connected across the NC terminals to measure line voltage and the two wires are directly connected to the input on the monitoring system. The common wire to both systems must be located to the ground side of the input (Green) terminal of the Series 800 Controller. This input signal to a monitoring system can also be utilized as a REX to initiate the shunt required within the monitoring

If … the monitoring or access system is seeking a REX (request to exit) input for a legal exit. The initiating device with a DPDT switch installed uses one half to signal the controller to release the
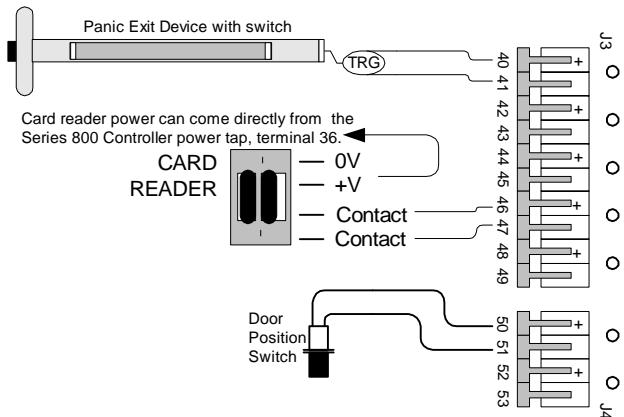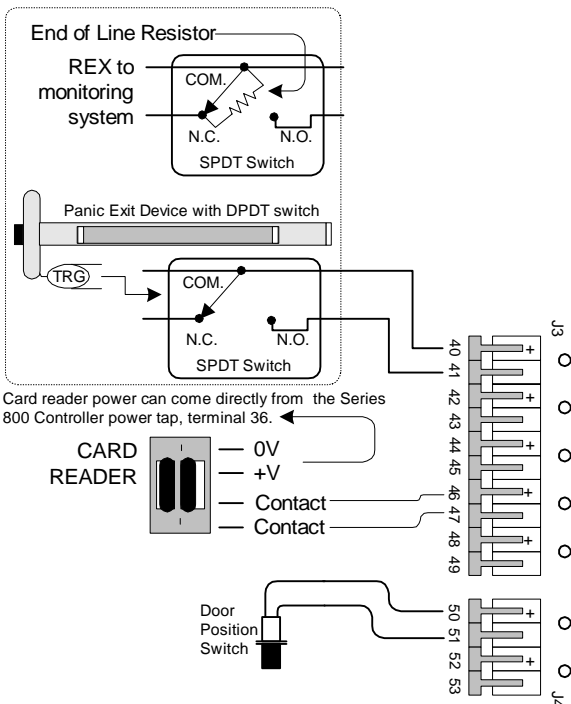
locking mechanism and the other half to provide a REX directly to the monitoring system rather than taking a signal output from the RLB 800 controller.

The primary method of generating output from all access systems is through the use of relays. The relays are controlled by the software program and can be event related or clock controlled. An event output to a relay is a valid card read. A clock output is a time group for unlocking a lock at a specific time and relocking at a later specific time, the time slots are selective and are at the operator's discretion for when and how long.

Access systems are varied in their capability to provide output switching and this is where the Series 800 Controller. can meld the application sequence between system and devices. Even though the access system may have more than one relay available at the opening, one relay is always dedicated to lock control and if there are two, the other is usually linked to the lock relay. This relationship is similar to the default operation of the Series 800 Controller in that the second relay will activate when the grant time has expired to initiate the "door ajar" output, that in turn starts a sound alert.

Beyond this basic requirement triggers are required to sequence device activity, the most expedient method of handling these situations is to use a Series 800 Controller. The most complex method would be to add a group of auxiliary components such as relays and timers to create the working of the Series 800 Controller or employ an auxiliary relay board from the access system. This additional control board may or may not provide the operation required as the software must first be able to manipulate the relays from external inputs and generate sequential time output according to the sequence of operation required. Not impossible by any means and readily accomplished by a PLC (programmable logic controller) application although the software has to be created as part of the process. At this point the expanding application at the opening may reach an economic saturation level, which again suggests the
Series 800 Controller as being a viable solution because it is inexpensive compared to the above mention solution.

In conclusion, a single output relay from the access or intrusion system can connect to the input system of the Series 800 Controller and provide a series of programmable relay and time operations to make the field devices a seamless application.

DRW –51
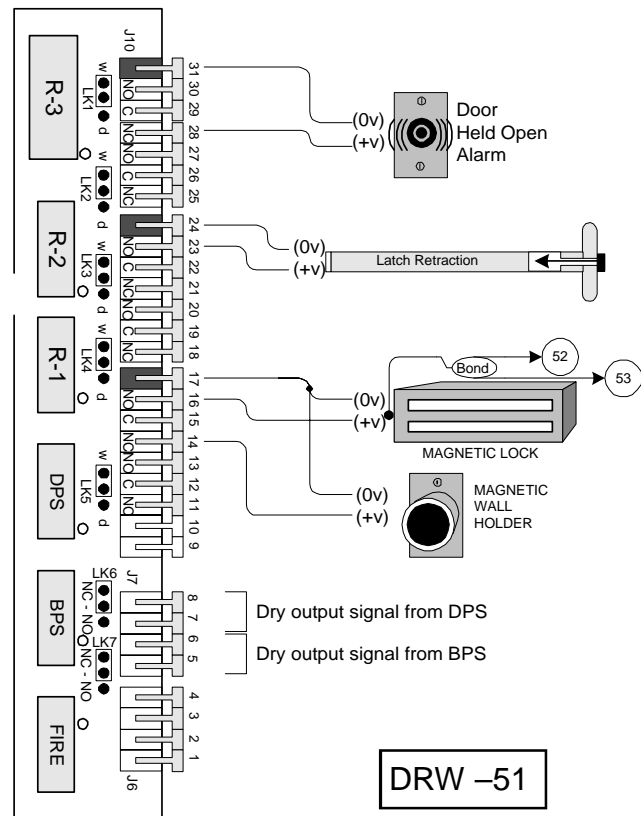
3.4   Magnetic Door Holders

Magnetic Door holders are the opposite of magnetic locks, they hold the door open and can be wall mounted, floor mounted or an integral part of a hydraulic door closer. They are fail safe devices and are usually a part of the fire dropout system in that during a fire condition, they are without power. The operating voltage must be 12 or 24VDC in order to be powered from the Series 800 Controller. This is mentioned because there are 120VAC models of the wall and floor type and the relays on the controller cannot switch line voltage.

The staging associated is simple and can be made operational using the lock relay R1 to control the locking device as well as power up the magnetic holder. When a fail-safe lock is de-energized, the holder is energized, which is a normal happening in cross-corridor situations for daytime operations.
Ref: DRW-51

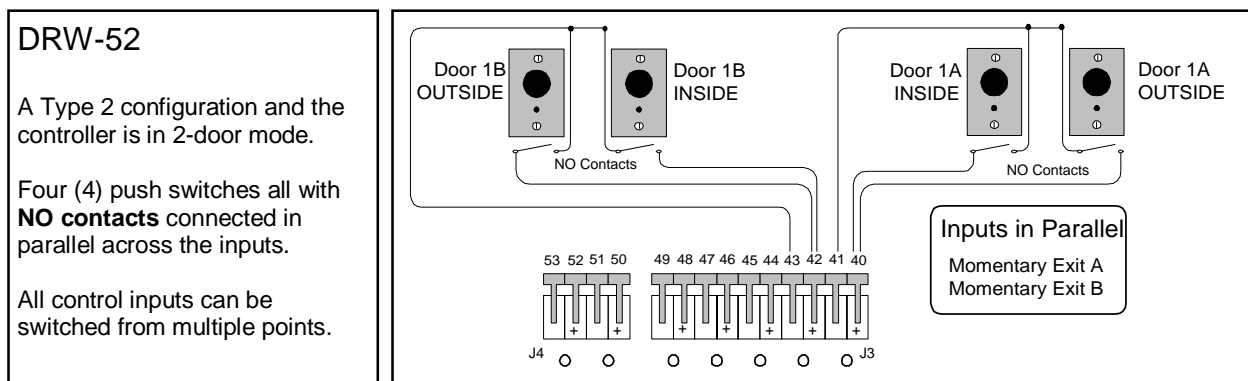## 3.5   Multiple Point Release Inputs and Control Panel Integration

The Series 800 Controller offers solutions for multi-point activation of a single controller or, when expanded upon, a system of doors controlled from a switch/monitor panel. A further expansion would be a group of doors from more than one panel. On a lessor level of quantity, but a significant increase in complexity, the creation of multi-door interlocks. Series 800 Controller easily relates to multi-door interlocks with a minimum of interconnecting wire between the controllers while maintaining a high level of security as only one input can trigger a lock release. The DPS/BPS only confirm status to keep the interlock active if either a door is not closed or the lock is not secure.

Control Panels for Series 800 Controller's are generally provided in two formats, Type 1) where all control is from the panel, there is no local override control of devices at the opening, and Type 2) where control can come from more than one location. The only other mitigating condition is that delayed exit, if employed, can only control one opening. Otherwise the controller is often configured into 2-Door mode with Toggle mode invoked for panel applications.

The basic panel activity labeled as Type 1 is either a timed by-pass (momentary) or an Unlock (alternate) of the doors being controlled. The panel only needs to have a momentary switch for each of the functions associated to each door since it is in toggle mode and inputs 40 to 43 and 44 to 47 are responding to momentary inputs. Inputs 40/41 and 42/43 provide the momentary by-pass while 44/45 and 46/47 changes the state of the lock relays R1 and R2 as the controller is in 2-Door mode.

Type 2 panel setup is the same as Type 1 except that the switches used, regardless of their location (panels or at the opening), all switches must be Normal Open (NO) and connected in parallel across the input.

Common to all panels, and, many devices at the opening, is visual confirmation of the status of the door or locking device. The controller will ship status information for the DPS/BPS through outputs 50/51 and 52/53. Power is provided to 6 and 8 from the tap and the setup as described in *Section 3.2* is employed so that the Led's on the control panel can mirror door and lock activity. Visual confirmation of the switch input is taken from the external Led drivers, terminals 54 through 59. (*Ref: Section 2.2.*) Additional output signal information can be taken from the relays, wet or dry, as required.

DRW-52

A Type 2 configuration and the controller is in 2-door mode.

Four (4) push switches all with **NO contacts** connected in parallel across the inputs.

All control inputs can be switched from multiple points.

Door 1B OUTSIDE — Door 1B INSIDE — Door 1A INSIDE — Door 1A OUTSIDE

NO Contacts — NO Contacts

Inputs in Parallel
Momentary Exit A
Momentary Exit B

53 52 51 50   49 48 47 46 45 44 43 42 41 40

J4   J3

Control panels, being remote from the opening, are not aware of activity at the opening and therefore in some instances need a call button to trigger a visual/audio alert from each of the controlled openings. Series 800 Controller **provides a separate module** that will respond to two call buttons. The call will automatically latch when activation occurs from a NC button being depressed. There is a Led driver for each button and a common audio driver that requires a reset in order to negate the input. This reset can be threaded through the corresponding lock relay to force attendance to the call in order to obtain a reset, or a separate reset switch can be applied to the control panel dedicated to this activity.
*Ref: DRW-48*

Multiple Point Release Inputs and Control Panel Integration continued ......

The call module will provide a visual Led feedback to the call button as well as provide the visual indication on the control station panel. Integration of the call module output it at the desecration of the integrator as the purpose of the module is to add a feature of responding to presence at the remote station for door activity. Using this module to also activate a call into a paging or intercom system may be convenient if the RLB800 controllers are local to the control panel and the other systems. The reset trigger requires a plus (+V) to terminals 64 and 70. A separate data sheet is available for the call module, *Ref: DRW-T502*
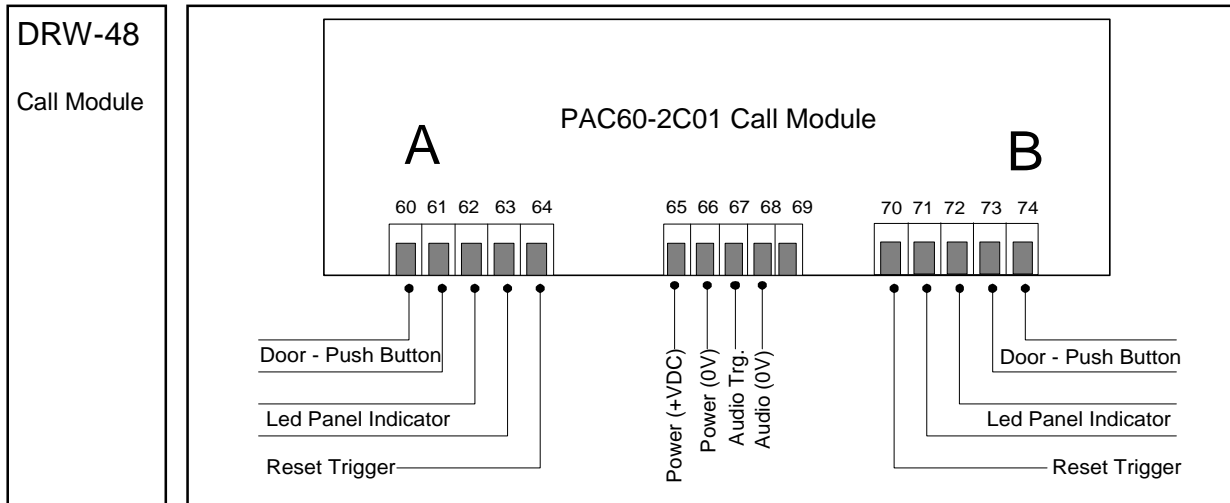
3.6   Retractor Panic Exit Devices

Panic exit devices that have internal latch retraction or automatic dogging mechanisms are being employed on exit and path to exit doors in ever increasing numbers. They satisfy many of the concerns associated to life safety for exit while providing remote control over opening and closing of large service buildings, such as schools or retail malls.

The elimination of the need for fire integration at the opening, for exit, simplifies many applications while providing a real cost benefit. Bolt latching occurs regardless of power presence (as they are fail-secure devices) and that they can be employed to fire rated openings makes the retractor panic a viable solution for door control where push/pull operations are desired for general operations. An application utilizing the Series 800 Controller is basic and the Quick Start section utilizing default settings is all that is normally required to complete the hook-up.

Some retractor panics require high inrush current of up to 16 amperes @ 24V to accomplish the actual retraction process and then draw a minimal current to hold the bolts retracted, others use servo motors. The servo motor will eventually be a standard for all devices that retract or project bolts as they are compact in size, electrically efficient and draw a small amount of current while providing high torque pull or push characteristics. The Series 800 Controller will provide control to all servo motor applications from the default setup. When a secondary power device is required, if the draw exceeds 8 ampere @ 24VDC the (Relay R3 only) activation must be accomplished as a trigger switch that is looking for a dry contact closure to activate the power transfer to the device. The auxiliary power supply has to have this setup in place and is usually provided by the panic manufacture. In this situation dry out the relay pole (R1, R2, R3) selected as the trigger that makes the connection to the Series 800 Controller.

Retractor Panic Exit Devices continued …….

When providing door pass through security while relating to building code, opening design, access and compliance to ADA requirements requires that serious consideration be given to integration of devices at the opening, regardless of external systems that may also be layered onto the application.

Integration of card access with the retractor panic in high frequency applications is not recommended in that the panic is inherently not suited to high frequency use by the fact that it has numerous mechanical parts that eventually wear from use. The alternate may be a magnetic lock applied to the same door when a secure latching must occur in the event of a fire or power failure. The panic is held retracted at all times, the magnetic lock is always locked secure except to a valid card read or a remote release for a designated clock period. The door is now push/pull operation when released. In the event of a fire the bolt is released, the magnetic lock drops out and the opening is secure as the card reader may or may not be enabled to retract the panic bolt. Exit on demand, in all instances, is always available.

DRW-53
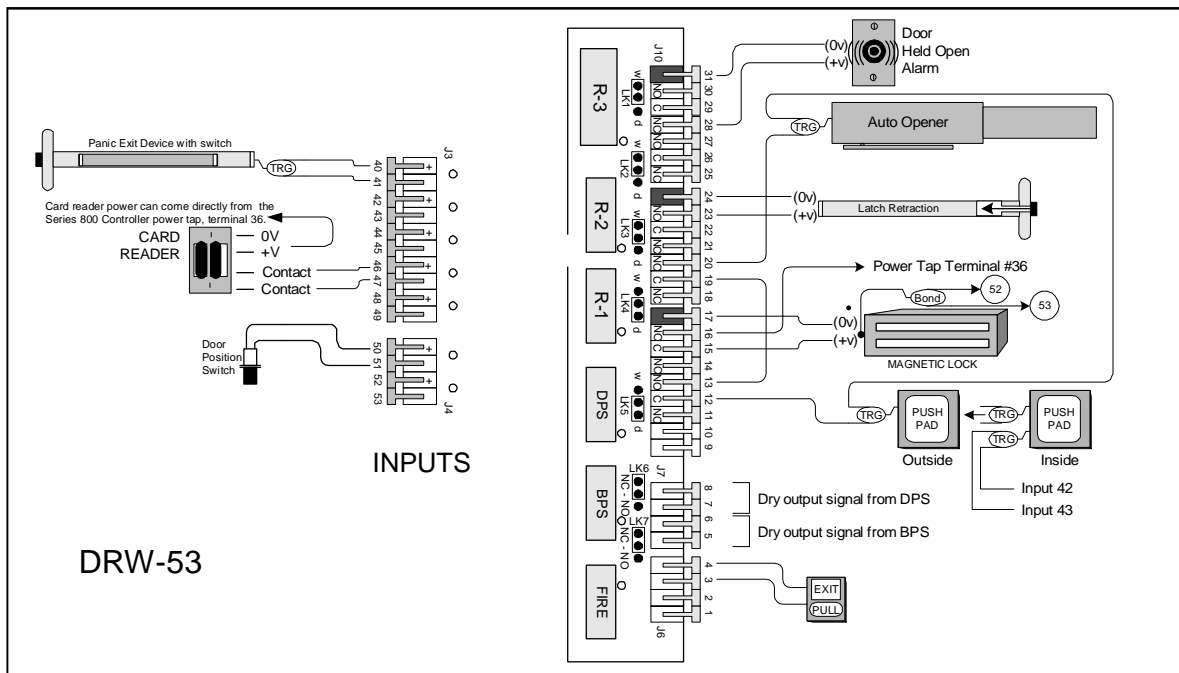
The addition of an auto-opener makes further demands on the integrator, as the power assist to open is operational from two triggers, one entry and one exit. The exit is usually, but not always, available to allow egress except during a fire condition as the retractor bolts are seated. Card access may also be required to enable a valid exit. The configuration should be able to deflect an input to activate the auto-opener if the panic bolt for some reason is released, or sequence a series of events to make it happen. The magnetic lock is released and the panic bolt are retracted in one operation, this operation is to be complete before the auto-opener can be activated. Control of the outside push pad has to be integrated to card access activity for entry as the pad cannot activate the auto-opener unless a valid card is employed. The standard Series 800 Controller only has to be configured to accomplish this typical application.

Typical settings are:

1. Jumpers for relays R1 and R2, LK4 and LK5 are repositioned to "d", the contacts are now dry
2. Both the Outside and Inside push pads are threaded through R1 and R2 to insure the lock is released and panic bolt is retracted before the operator can be triggered.
3. The Inside push pad is also connected to the input side of the controller to trigger a lock release, 42/43
4. R1 is now dry, power is brought from the tap #36 to energized the magnetic lock
5. The trigger from the panic on bar depression will release the magnetic lock for exit
6. Relay R2 is disabled as described in Section 3.27.
7. The door held open alarm will sound if the door is propped or held beyond the grant time selected.

Section 4.0
Power and Technical Support

Power is the lynchpin to a performing system. The Series 800 Controller power regulation module is designed with ample fuse protection and a switching regulation module.

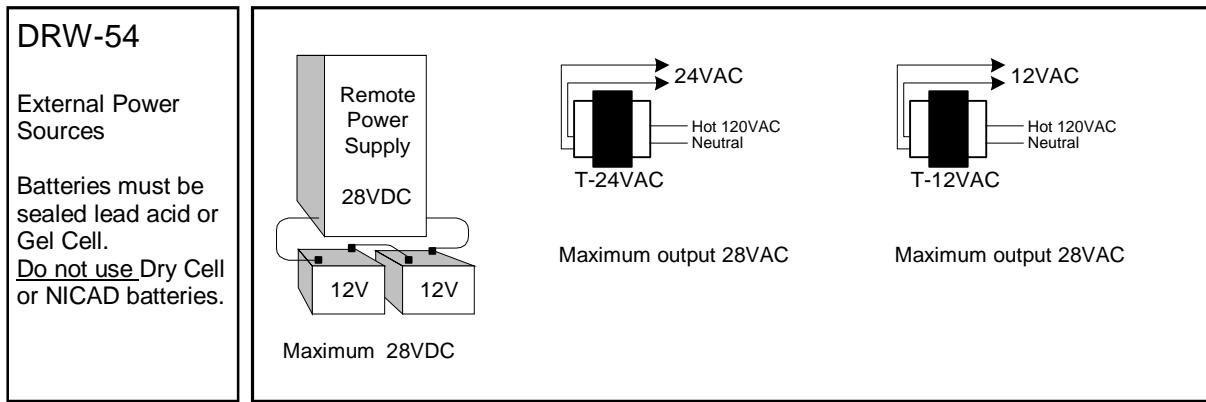## 4.2   System Applications for Daisy Chaining from a Central Power Supply

4.0   Power and Technical Infrastructure Support for Field Settings

Once power is applied, the Series 800 Controller has been designed to be a complete stand alone opening control system that can include low voltage power for all of the devices connected. A true demarcation line between the door hardware and others is evident and can be documented by a manufactured product that is listed with UL for "Special Locking Arrangements" and provide power for the UL listed devices connected to it. The Series 800 Controller also provides "System Listing" for the total opening where required by the AHJ when specific products are used in conjunction with the Series 800 Controller.

Particular attention has been given to the control of power and the term "power controller" is often mentioned throughout the manual, as the majority of external devices connected require low voltage power. The enclosures and configurations that carry the controller to the application or portal are packages designed for integration to conduit systems as well as surface or flush wall conditions.
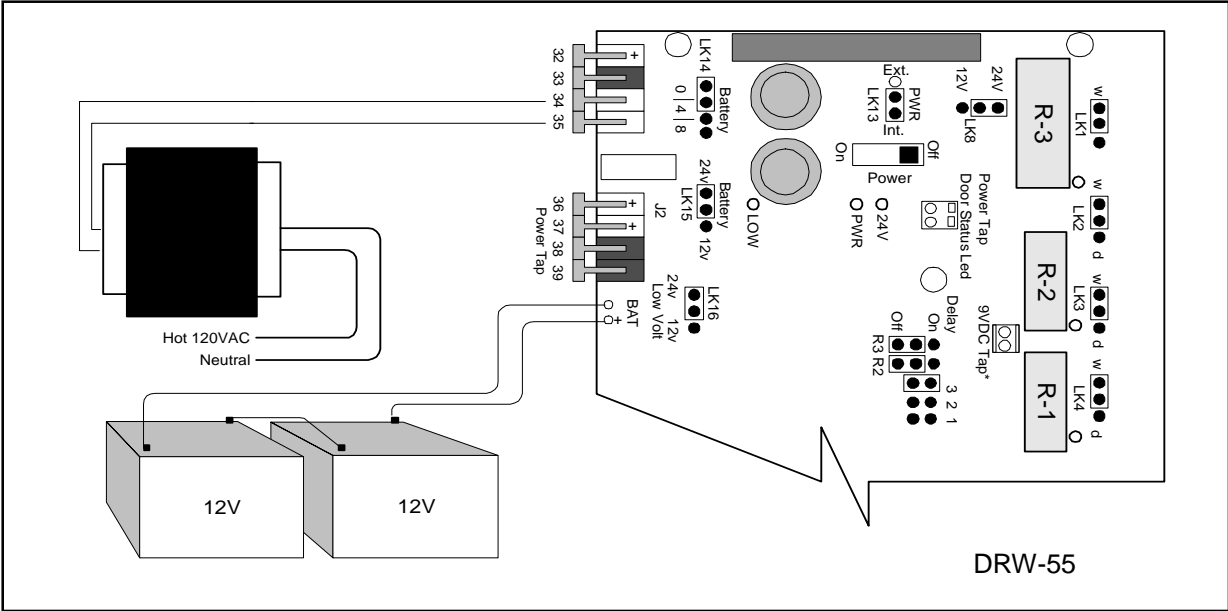
4.1 External Power Sources

The controller 20-800, 30-800 and 40-800 all require external low voltage power in order to become operational. The source can be a UL listed power supply for Burglar Alarm or Special Locking Arrangements, AC or DC up to a maximum of 28 volts.

DRW-54

External Power Sources

Batteries must be sealed lead acid or Gel Cell.
Do not use Dry Cell or NICAD batteries.

Remote Power Supply 28VDC

Maximum 28VDC

24VAC — Hot 120VAC / Neutral — T-24VAC — Maximum output 28VAC

12VAC — Hot 120VAC / Neutral — T-12VAC — Maximum output 28VAC

Power and Technical Infrastructure Support for Field Settings continued ……

DRW-55

All controllers have a battery charging circuit that will support either 12V or 24V battery packages with two levels of charge rate. One setting is for 4AH (Ampere Hour) and the other is for 8AH batteries . The controller with all features active will draw a maximum of 220 mA. The controller has a low voltage cut-off, that once minimum output levels from the battery are reached, the relays will drop out to signal an alarm that the system has failed if it is being monitored. The threshold points are 9V for 12 volt operation and 18V for 24 volt operation. Consult battery chart for approximate discharge rates as they are affected by temperature and their life cycle.

|						UL Std.						DRW-56
		Min.	1Hr.	2Hr.	3Hr.	4Hr.	6Hr.	8Hr.	12Hr.	16Hr.	24Hr.
Current Draw	300 mA	4AH	4AH	4AH	4AH	4AH	4AH	4AH	4AH	8AH	8AH
	500 mA	4AH	4AH	4AH	4AH	4AH	4AH	4AH	8AH	8AH	
	750 mA	4AH	4AH	4AH	4AH	4AH	8AH	8AH			
	1.0A	4AH	4AH	4AH	4AH	4AH	8AH	8AH			

The battery chart contains a column labeled "Min" which references the battery capacity required to maintain the system until an emergency generator takes over as auxiliary power . This system should start within 3 minutes. This auxiliary system is not to be confused with a UPS system which is instant.

Underwriters Label, UL requires 4 hours of operation followed by a 24-hr. recharge period and then be able to provide another 4 hours of operation. Maximum life of lead acid and Gel Cell batteries is 5 years and for optimum performance should be checked each year. All chart calculations are taken at room temperature.

4.2   System Applications for Daisy Chaining from a Central Power Supply

Series 800 Controller enclosures have been custom designed to accommodate the varied architectural environments of a construction program. The 20, 30 and 40 Series controllers are able to link to a central low voltage power source by conduit whether it is a simple transformer providing AC current or a regulated DC power supply. The 20 Series is a flush box with hinged and locked cover for locating at the opening where a ceiling does not exist. The 30 Series is a surface box that is often placed above the ceiling line. The 40 Series, with a hinged door and optional lock, provides the extra room for complex applications. Series 800 Controller will provide custom fit-up for external components, to enable a single box fit-up to occur at the opening.
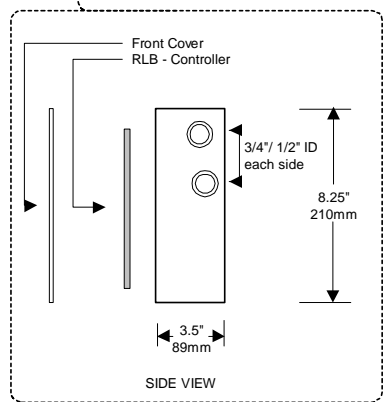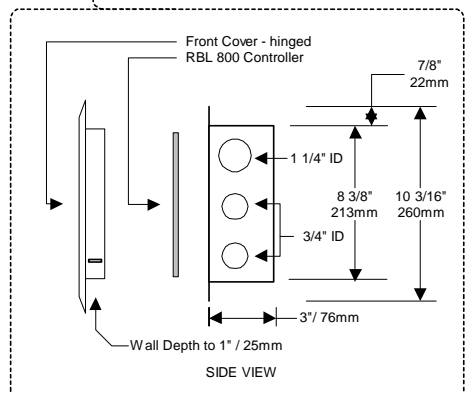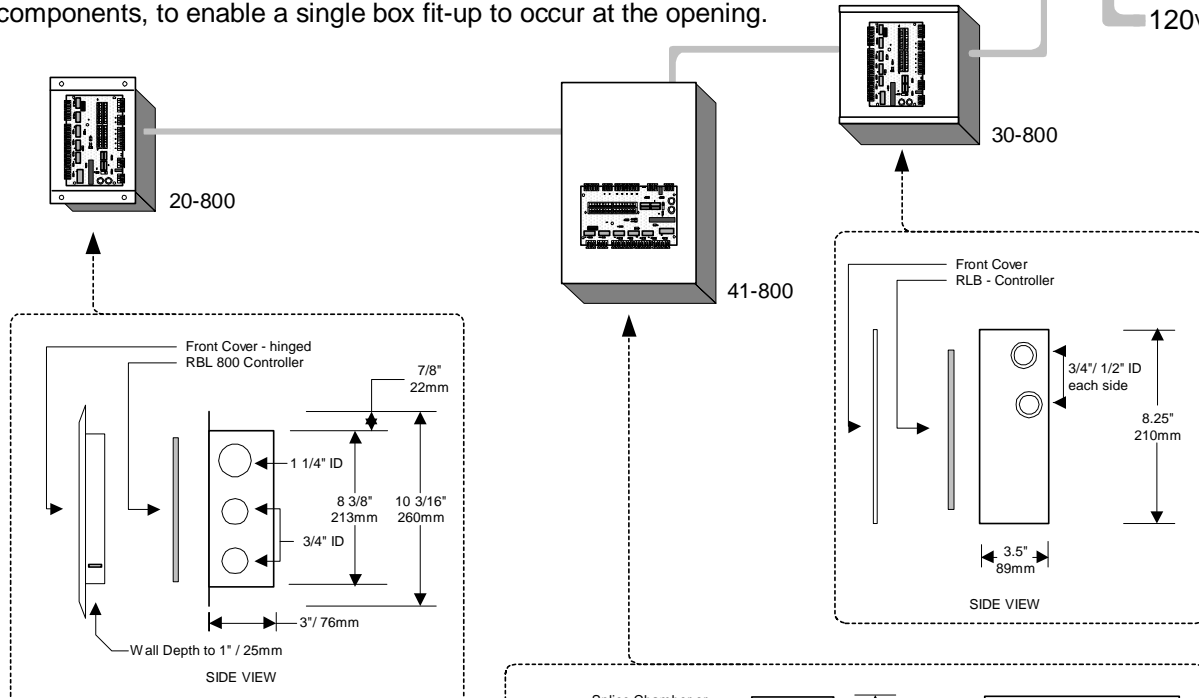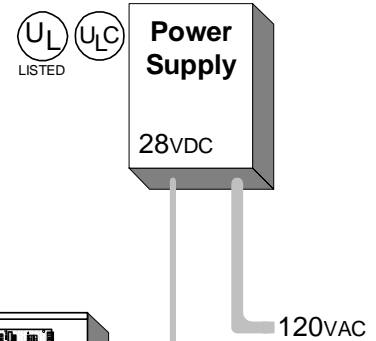
Each controller has a Low Voltage Led from a diagnostic circuit located between jumper switches LK15 and LK16. The led will turn On if the voltage to the controller is below the required level necessary for the controller to operate properly. The reasons for a low volt indication may be a wire gauge that is to small for the distance that the controller is from the source, the remote power source is not able to supply sufficient current or the external device load exceeds the available power. Also check for pinched wire from door devices. Disconnect each device separately if shorts are suspected. There are 17 diagnostic Led's incorporated to enable each transaction to be visually tracked from device input to relay output.

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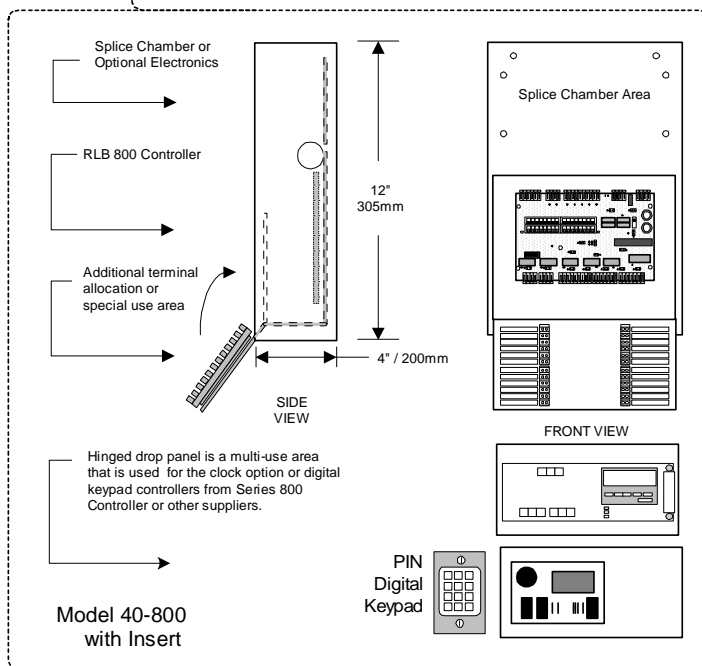
4.2 System Applications for Daisy Chaining from a Central Power Supply

To set up a central power system requires a power supply and knowledge of the current loading or current draws the field devices and the controllers will take to become operational. The intended power supply is a UL listed supply for Fire, Burglar Alarm or Special Locking Arrangements and we are linking the system together with wires in conduit.

Our example is 10 doors and a central control console, doors 1,2,3 & 4 are connected to 2 controllers and the controllers are configured into 2-Door mode. Doors 5,6 & 7 are retractor panics and widely dispersed so they are individually controlled. Doors 8,9 & 10 are delayed exit applications and each pair of doors is controlled separately. There are a total of 8 Series 800 Controllers in this system.

We now have options concerning fire and standby power to choose from:

1. The fire alarm can be connected to the central power supply if it has a dropout relay component as a part of a manufactured system. This is a cost saving, as the fire system does not have to be strung out to each controller. If the AHJ requires a pull station to be located at the door, a situation that can often be the case when magnetic locks are installed, then a pull station with a DPDT switch can be employed. One side of the switch triggers a direct link to the fire system and the other side is connected to the controller terminals 3/4. This provides a redundancy to insure a lock release at the door in question even if the fire system should fail.

2. Battery backup can be employed at the location of the Series 800 Controller or at the central power supply. If the back-up time required would exceed 20AH it will be necessary to employ larger batteries. Our proposed system is drawing approximately 7 amperes that will only give us about 3 hours of back up time if they are totally drained. We must keep in mind that the controller's cutout will activate when the batteries reach an output level of 18 volts. This is to insure that the magnetic locks do not drop out while the controller relays remain active and do not report an alarm if bond sensing is not employed. Obviously a large capacity battery system is required to obtain a backup to UL standards. We are assuming the system is being monitored. Consult with the power supply manufacture for a setup that will provide the ability to charge the standby batteries.

3. If batteries are installed at each Series 800 Controller, the worst case situation in our example is the latch retraction application that has a draw of .600 A. Using our maximum allowed battery application of 8AH, this will provide approximately 13 hours of backup or approximately 4.5 hours before cut-off. A container has to be provided to hold the batteries that is an option. The 40 series controller has a secured addition to the box that will hold 2 /4AH batteries. The 20 and 30 series use the same enclosure but without electronics mounted inside. The extra enclosure is installed beside the controller and it will hold 2/4AH batteries.

Device Load Schedule

Doors 1,2,3 & 4   4 Sgle. Doors / Controllers are in 2-door Mode

2	Series 800 Controller	@.220A
4	Magnetic Lock	@.125A
4	Touch Sense Bar	@.065A
4	Door Ajar Alarm	@.350A
4	DPS	@ 0

Total   2.16A

4.2   System Applications for Daisy Chaining from a Central Power Supply

Device Load Schedule continued ....

Doors 5,6 & 7   **3 Sgle. Doors / Controllers Default Mode**

3	Series 800 Controller	@.220A
3	Retractor Panic	@.450A
3	Holder (floor)	@.150A
3	DPS	@ 0

                                                                Total   2.46A

Doors 8,9 & 10   **3 Pr. Doors / Controllers Delayed Exit NFPA 101**

3	Series 800 Controller	@.220A
6	Panics (switch)	@ 0
6	Magnetic Lock	@.250A
3	Voice Module	@.070A
6	DPS	@ 0

                                                                Total   2.370A

Control Console - Led indicators, switches for 12 stations

Total Draw   **6.990A**

The total draw on our power supply is almost 7 amperes (6.99) that suggests that a minimum rated supply of 10 amperes is required. Even though the power supply will provide 10A it should be noted that <u>the draw should not exceed 2/3 of the available current</u> to power up the system. A power supply operating at a sustained maximum output level will produce excessive heat that will eventually cause it to burn out. A comparison would be running your car and engine to its maximum output speed continuously, a very serious matter for engine longevity.

The Series 800 Controller will accept up to 28 VDC, check Electrical Specifications on pages 50 and 51 for detailed information

If …. Standby power is part of your application, insure that the 24VDC power supply has an adjustment to increase the output voltage by at minimum 15% to compensate for the battery charging draw. The power supply should be set at 27 V for 24 volt systems and for 12 volt systems, the setting is 13.5V.

Power - the RLB800 controller will accept AC or DC current of 30 volts or less and convert it to DC output through onboard regulation. The selection by jumper links is 12VDC or 24VDC at the relays or power tap. A constant tap 9VDC socket is available to also power external devices. It is located on the center section of the controller. When fully operational the current consumption of the controller is 220mA maximum without external devices connected.

To retain UL listing the power supply used must be listed for Fire, Burglar Alarm, or Special Locking Arrangements. A setup procedure follows this statement to insure that jumper links are properly positioned to power up the controller.

1. RLB-800 CIRCUIT BOARD INSTALLATION SET-UP PROCEDURE

The following outlines a step by step procedure to ensure that the correct settings are selected when installing a Series 800 Controller board.

2. POWER SETUP

     1. Set the **System Voltage** jumper link LK8 to **12V** or **24V**. This is dictated by the voltage requirements of the external devices being used.

     2. Set the **Voltage Low Monitor** jumper link LK16 to **12V** or **24V**. Select the same setting as in step 1.

     3. Determine the power source that will supply the controller. Refer to the Electrical Specifcations: Input Voltage Requirement in order to provide a proper power source. Choose one of the following (a to d) that corresponds with your intended set-up.

NOTE: Remove the fuse or cut power from the main source until the power section is complete.

a. If your controller is a model 10-800 (120VAC input), connect the 120VAC line to the 2 position terminal block.

   If your Series 800 Controller is a 10-800 Series ensure that the HOT, NEUTRAL, and GRD lines are correctly wired. Verify that the regulated Power Source jumper link LK13 is set to Int.

b. For a low voltage AC source, connect to clamp terminals 34 and 35. Set Regulated Power Source jumper link LK13 to Int.

c. For a low voltage unregulated DC source, connect the positive line to clamp terminal 34 and the negative line to clamp terminal 33. Set Regulated Power Source jumper link LK13 to **Int.**

d. For a low voltage regulated DC source, connect the positive line to clamp terminal 32 and the negative line to clamp terminal 33. Set Regulated Power Source jumper link LK13 to **Ext.**

3. POWER TEST

1. Apply power to the controller. Slide the **On-Board Power Switch** to the **ON** position.

   The **PWR** LED should be **On**, the **LOW** LED **Off**, the **RESET** LED **Off**. and the **24V** LED **On** if it is a 24V system, **Off** if it is a 12V system. If this is not the case, turn the power off immediately and note which LED was in error. **Correct the problem before continuing on**.

If possible, measure the voltage between terminals 37 and 38. This is the POWER TAP output. The regulated system voltage can be read across these terminals.

If your Regulated Power Source is set to **Ext**., then the reading should be the same as the regulated input supply across terminals **32** and **33**.

If your Regulated Power Source is set to **Int**., then the reading should be close to the system voltage selected. See Electrical Specifications 4.4 : On-board Regulator Characteristics, to verify that the reading is within spec.

4. BATTERY INSTALLATION

If your Regulated Power Source is set to **Ext**., or a local battery back up is not implemented insure that jumper link LK14 is set to 0 = no battery. Then pass over the balance of this section.

If battery backup is a part of your application, set jumper link LK15 to the same power as the output selection, either 12 or 24V.

Black and red battery leads are connected to the controller board. The red lead goes to the **positive** terminal and the black lead to the **negative** terminal of the battery. If the batteries are rated @ 4AH, position the link jumper LK14 across the center 2 pins = 4AH battery. If the batteries are rated @ 8AH, position the link jumper LK14 across the last 2 pins = 8 AH battery.

a. For a 12V system, a single 12V battery is required.
For a 24V system, two 12V batteries wired in series are necessary.

DRW – 57

A 9 VDC tap plug is located below Relay R1 and R2. This is a regulated constant output that can be used for external components directly or it can be strung through a relay common that has been dried out.

CAUTION – The 9 Volt DC TAP is intended to support devices that would normally require a 9V battery for their operation. The draw load should not exceed 100mA. Optional 5VDC is available in place of the 9v on a custom order basis.

N**ote:**
The male plug is not shipped with the controller unless so ordered. Use plug with 5mm spacing equal to:

Manufacture: WECO 120-A-111 / 02

CURRENT CONSUMPTION – when the RLB800 controller is powered up and all relays are active, total draw does not exceed 220mA without external devices connected.

Section 4.4

4.4 Electrical Specifications

Test Parameters	System Type	Measurement Conditions	Min.	Max.	Notes
LOW LED Trigger	12V	Voltage trigger point at battery or Regulated DC Input that activates LOW LED.	9.0V	10.1V	
	24V		18V	20V	
24V LED Threshold	24V	Voltage threshold at battery or Regulated DC Input that activates 24V LED.	16V	17.5V	
LOW Voltage Current Draw	12V	Current draw from battery or Regulated DC Input when LOW LED activated		40mA	1
	24V			60mA	
Quiescent Current	12V	Current draw from any power source		220mA	2
	24V			220mA	
Voltage Source Requirements (Terminals 32 to 35)	12V	Externally regulated DC Voltage At Regulated DC input	11V	17V	3
		Unregulated DC Voltage at Unregulated AC-DC input	16V	37V	4
		Unregulated AC Voltage at Unregulated AC-DC input	13Vac	28Vac	
	24V	Externally regulated DC Voltage At Regulated DC input	22V	28V	3
		Unregulated DC Voltage at Unregulated AC-DC input	27V	37V	4
		Unregulated AC Voltage at Unregulated AC-DC	20Vac	28Vac	
On-board Regulator Characteristics	12V	Output voltage present at power tap terminals and "wet" linked relay outputs	12V	36.5V	5
	24V		24V	27V	
	12V	**Model 10-800** Total continuous current available at power tap terminals and "wet" linked relay output.		2A	6a
	24V			1A	6a,6b
	12V	**Models using remote un-regulated AC/DC source.** Total continuous current available at power tap terminals and "wet" linked relay output.		2A	6c
	24V			1.6A	
	12V	**Models using remote un-regulated AC/DC source.** Total intermittent current available at power tap terminals and "wet" linked relay output.		2.8A	6c,6d
	24V			2.4A	
Absolute Maximum current Output		**Models using remote regulated DC source.** Total continuous current available at power tap terminals and "wet" linked relay output.		3	6e
Operational Temperature Range		With externally regulated voltage source.	0*C	70*C	7
		Using the on-board regulator at full load.	0*C	70*C	
		Using the on-board regulator at half (1/2) load.	0*C	70*C	
Input Characteristics (Terminals 40 to 53)		Open circuit input voltage (pull up via 4.7K ohm resistor).		5V	8
		Closed circuit current.		1.2mA	
		Logic low input range	0V	1.5V	
		Logic high input range	3.5V	28V	
External LED Drive (Terminals 54 to 59)		Activated LED Current	10mA	15mA	

CAUTION – The 9 Volt DC TAP is intended to support devices that would normally require a 9V battery for their operation. The draw load should not exceed 100mA .

4.4 Electrical Specifications

Test Parameters	System Type	Measurement Conditions	Min.	Max.	Notes
Fire System Reset (Terminals 1 and 2)		Current during momentary contact closure		25mA	
Fire System Shutdown		Current flow thru N.C. external fire relay contacts		5mA	
BPS and DPS Relays (Terminals 5 to 8)		Relay contact ratings		2A	
Lock Control Relay 1 (Terminals 9 to 17)		Relay contact ratings		2A	
Remote Alarm Relay 2 (Terminals 18 to 24)		Relay contact ratings		2A	
Local Alarm Relay 3 (Terminals 25 to 31)		Relay contact ratings		5A	

NOTES:

1. Fire relay active, no external loads active.

2. All relays active, no external loads active.

3. May be limited by the operational voltage rage of the external devices used.

4. To allow for a minimum 10% line fluctuation, Min/Max values should be increased and de creased by 10% respectively.

5. Range covers no-load to full-load condition.

6. a.) measurement made with the line voltage ranging from 80% to 110% of nominal. (nominal = 120Vac)
   b.) 1 ampere maximum is measured @ 80% line, 1.5A @ 100% line.

   c.) the remote power source must be capable of sustaining the "input voltage requirement" for worst case load current.

   d.) measurement made with output load being switched on for ½ second, off for ½ second.

   e.) the maximum current capacity is a function of the "power rating" of the regulated DC source.

7. An extended temperature version that allows operation at -30 degrees C is available.

8. Input measurements are made between the orange terminal (positive) and the green terminal (ground).

Glossary

AC – is an abbreviation for a type of power – Alternating Current as opposed to DC – the current is alternately on (+v), then off (0v). This is the type of current power provided by transformers.

ADA is the abbreviation for American with Disabilities Act of 1990. This legislation has been adopted as a model in other countries and in our industry, it usually relates to "right of access" or egress, especially in public buildings.

AHJ is an acronym coined by industry that refers issues of code and compliance to local authorities, it translates as "Authority Having Jurisdiction".

Alt. Is an abbreviation for the term "Alternate" used in the context of this application to describe the activity of an input switch – an example is a light switch, activation changes the state from on to off or vice versa, depending on what state is NORMAL. This type of switch is also often described as "Maintained".

BOND – an abbreviation for "Bond Sensor" circuit as found in magnetic locks – confirmation that the magnetic bond has taken place between the lock body surface attached to the door frame and the strike plate surface attached to the door to the manufactures specification. A true bonding circuit confirms power and surface mating.

DC – is an abbreviation for a type of power – Direct Current as opposed to AC – the current is constant and is the power provided by a regulating power supply. It is also the power supply required to charge stand-by batteries.

DEFAULT SETTINGS – the program settings for dipswitches and jumpers as placed by the factory before shipment.

DPS – is an abbreviation for the term "Door Position Switch" and is a switch positioned between the door and frame to signal to a monitoring circuit that the door has opened or closed. The contacts are usually provided as DRY in their NORMAL state.

DRY – for our purposes this is a term used to identify the status of a wire loop between points. If power (other than used for the current sensing trigger voltage), is not present, such as 9v, 12v, or 24V – the circuit is deemed to be "dry".

GRANT Time – this is a lock release time granted from an input.

INPUT DEVICE – the external devices connected to input terminals (40 through 53) that cause activation of the controller outputs.

LBM – an abbreviation for "Latch Bolt Monitoring" often associated to electric strikes and more recently locks and panic exit devices that have latching bolts that secure the door.

Led – an abbreviation for "Light Emitting Diode" – often used to indicate activity when a device is used or available for use.

LSM – an abbreviation for " Lock Strike Monitoring" confirms that the locking latchbolt or deadbolt is seated into the strike. This switch is often used to signal a "request to exit" to a monitoring circuit.

Mom. – is an abbreviation for the term "Momentary" used in the context of this application to describe the activity of a switch input – an example is a door bell, depress the button to make the input, release the button to brake the input.

NORMAL – an electrical term that defines the state that a set of contacts are positioned too, PRIOR to power or activity being applied.

NUISANCE Feature – this is a time sequence available to the delayed exit program whereby a warning from the local alarm is activated for a maximum of 3 seconds to warn people to release the exit bar if they are not intending to exit.

OUTPUT DEVICE – the external devices connected to the output terminals that will activate as a result of an input.

PIC is an abbreviation for the program chip installed on the Series 800 Controller and it translates as "Programmable Integrated Circuit".

REGULATED POWER – is a term describing the type of low voltage DC power required or provided. The (+V) plus voltage is constant similar to a constant flow of water coming from a hose.

SUPERVISED CIRCUIT – is a monitoring term applied to a circuit that is being constantly checked for its integrity. It is normally applied to a "dry" circuit that is normally an input. In reality there is a small voltage (5V) passing through the circuit that is monitored as being high (+v) to report secure and low (0v) if the flow is interrupted as would be the case if a contact switch (DPS) opened when a monitored door is cycled. The second part of the supervision circuit checks voltage fluctuations between 5 and 0, if the level preset by adding the end of line resistor changes it will report as a tamper or trouble alarm. As an example, fire systems will report this state change as a "trouble" indicator while an intrusion systems will likely report this same condition as "tamper".

WET – is the opposite of "dry"– the circuit has a voltage (+V) level that should be equal to the same voltage as being used for your system. In this instance the RLB800 controller provides, 9V, 12V or 24V, all DC voltage.

WATCHDOG – is an internal diagnostic circuit that monitors the program – it alternates On/Off approximately every second to indicate the program is executing properly. If it is steady On or Off the program is malfunctioning.