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EMF-1 / EMF-1m Multi-Function Timer

Installation Instructions

Ver. 2.03, Rev – June 06

MADE IN CANADA

PAGE 1 OF 11

Section 1

General Description

Camden model EMF-1 (or EMF-1m) is a micro-processor controlled multi-function relay. This all-in-one design replaces our special function relays – Models ESP-12; EDS-15; EWC-18, and EMT-30.

The EMF-1 easily handles specialized applications such as ABM vestibules, washroom doors in shared-use facilities, directional sequencing, man-traps (interlock), and more.

A simple rotary switch lets you choose the mode and the unit automatically programs the inputs, outputs and potentiometers accordingly.

Removable terminal strips simplify wiring chores, and all adjustments are conveniently located on one side of the case.

IMPORTANT: Do not apply power to the unit until you have read the instructions fully and made the required adjustments.

Section 2 Installation

Mounting

The EMF-1 should be mounted in a clean dry location out of direct contact with the elements. Suitable locations include inside a metal box, operator header, or above a false ceiling. If placed on top of a header, ensure that unauthorized personnel cannot tamper with the unit.

If used as a Door Sequencer, the relay may be located at either door location, or, centrally to both doors. You must bring wiring from all door actuators to this unit (as well as the lock and operator outputs).

This unit is also available in an attractive finished metal cabinet version (EMF-1m) suitable for wall mounting.

Wiring

Wiring of this unit is dependant on the mode desired. Select your intended application, then proceed to the section indicated.

Note: Do not wire *Safety devices* to the EMF-1. If installed, wire your safety device directly to the operator control box as per usual.

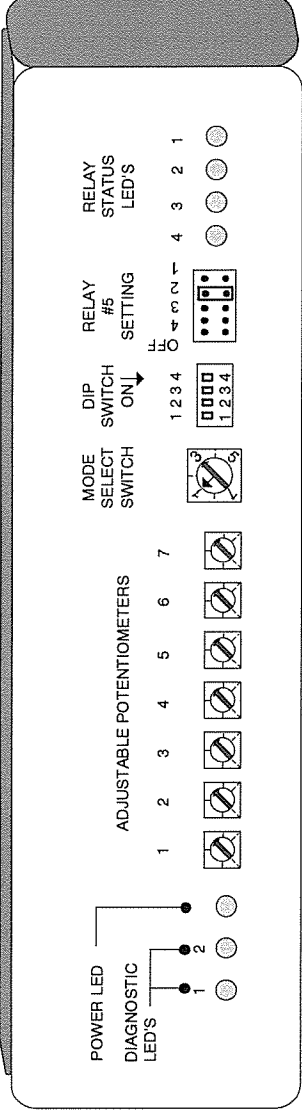
IMPORTANT: Changes to the Mode Selector Switch, Dipswitches & Jumpers, do not take effect until a power reset. It is therefore best to make these adjustments with the power turned off!

APPLICATIONS & SET-UP INSTRUCTIONS:

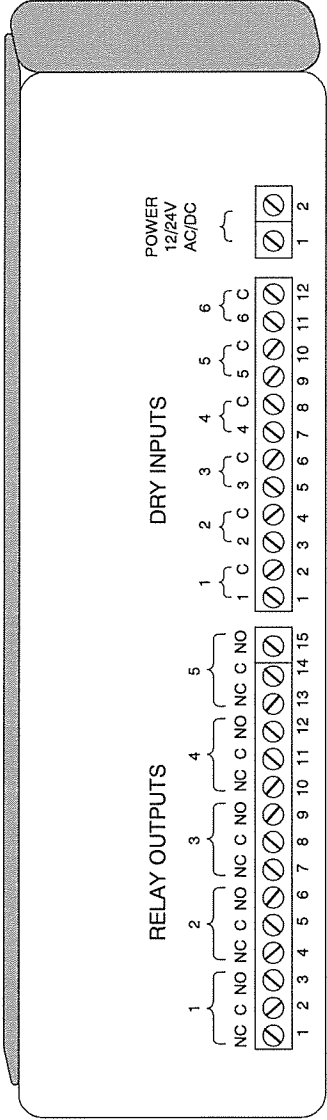
ABM Vestibule Control (replaces ESP-12)	Proceed to section 3A on Page 3
Bi-Directional sequencer (replaces EDS-15)	Proceed to section 3B on Page 5
Washroom Door module (replaces EWC-18)	Proceed to section 3C on Page 7
Man-trap (Interlock) relay (replaces EMT-30)	Proceed to section 3D on Page 9

**System Inspection Instructions,
Technical Specifications,
& Warranty** **Page 11**

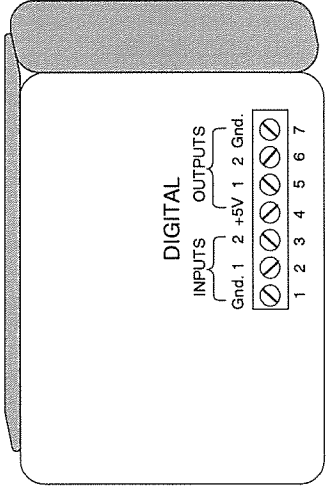
Left Side View
ADJUSTMENTS



Right Side View
INPUTS/OUTPUTS



End View
DIGITAL
INPUTS/
OUTPUTS



		5151 Everest Dr. Unit 6 Mississauga, Ontario L4W 2Z3	
Camden Manufacturing		DATE: 01/14/05	REVISED: 02/02/05
SCALE: NONE		DRAWN BY: DGW	
EMF-1 Diagram 1 - External Views			
DRAWING No: DRG-EMF-1-0001		FILENAME: EMF_1 DIAGRAM_1.vsd	

Section 3A

Set-up Instructions

ABM Vestibule Controller

The EMF-1 is a compact unit designed to interface an automatic door operator with a card reader and lock system such as those used on banks.

When in "Day Mode" either the exterior or interior activating device (ie - wall switch) will open the door. The strike is retracted (manually, or electrically) and the card reader is out of the circuit.

When the EMF-1 is switched to "Night Mode" the electric strike is energized (door is locked), and the exterior activator (ie - wall switch) is removed from the circuit. When a valid card is inserted, the strike unlocks immediately, and the exterior switch is put back into the circuit for an adjustable period, so that if pushed by the user, it will open the door automatically. The inside switch will unlock and open the door at all times.

Step 1

Turn the **Mode Selector Switch** to position "0". See diagram 1.

Step 2

Refer to Diagram 2 (next page) for the following connections.

Pull off the **Input terminal strip** (numbered 1 - 12), and make wiring connections. Re-insert connector.

Pull off the **Relay Output strip** (numbered 1 - 15), and make wiring connections. **Note:** Relays 3 & 4 are not used in this application. Use of Relay 5 is optional, and can be activated via the **Relay setting jumper**. (See diagram 1 for location). Re-insert connector.

If you are using this system with our Model #51T2B card reader - then remove the **Digital I/O strip**, and make wiring connections. However, if using our model ECI-210, or another type of card reader or dry contact - wire to Input Contact # 4, and *do not* wire to the **Digital I/O strip**. Re-insert connector.

Finally, remove the **Power strip**, and connect Terminals 1 & 2 to your 12 or 24 Volt AC or DC supply, **but do not apply power yet!** (The terminals are not polarity sensitive).

Step 3

Set Dip Switches

Push switch #1 **ON**, or in down position for a Continuous duty Strike, (which is to be active all day during "Day Mode").

If using an intermittent duty strike and/or the latch is to be mechanically retracted during "Day Mode", then

leave switch #1 **OFF** (or up.).

Switch # 2 selects type of cardreader. Leave **OFF** (or up.) for dry contact input (ie - #ECI-210). Push down (or **ON**) if a digital card reader (ie - #51T2B) is used.

Leave switches 3 & 4 in **OFF** or up position.

IMPORTANT: Any changes to Dip switches, jumpers, and Mode selector settings must be made with power off!

Step 4

Adjustments

In this application, you will use pots 1 - 4. Pots 5 - 7 have no affect.

Timer 1	Operator Delay-on-Release
Timer 2	Strike Delay-on-Release
Timer 3	Outside switch Enable Time
Timer 4	Operator Delay-on-Activate

Apply power to Door operator, EMF-1, and any applicable activating devices (ie - card-reader). Observe the green Power LED on the unit. It should be lit. If not, re-confirm proper voltage connections.

Turn Key switch (Input #3) to "Night Mode". (Night mode via an *open contact*, Day mode via *closed*).

Activate interior switch. Door should unlock and open. Adjust potentiometers 1, 2 & 4 for desired operating times.

Activate exterior switch. Door should remain closed and locked. Now activate the card reader. The door should unlock. Adjust Timer 2 for sufficient time on the strike.

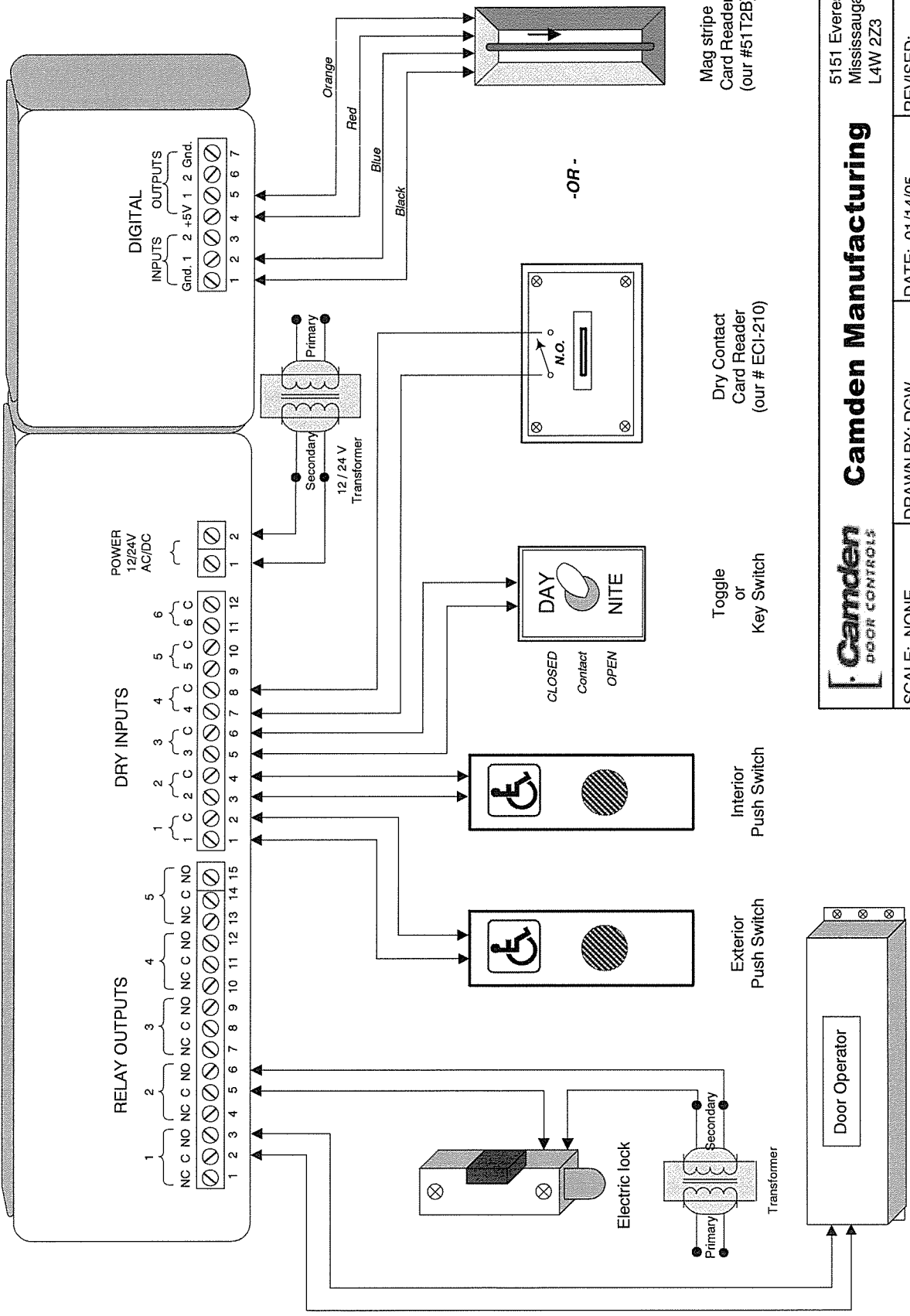
When the card reader (or Input #4) is activated, the exterior switch is "*put into the circuit*" for a limited time. This time is adjustable from 1 - 30 seconds via pot # 3.

Re-activate the card reader, and within the time frame, press the exterior switch. The door should now open.

Turn the Key switch (or other type switch) to "Day Mode". If the strike is to be dogged back mechanically, then do so. If it is to be powered all day long, then confirm that it is powered and retracted.

Now both the interior and exterior switches will open the door when activated. The card-reader has no effect on operation.

Once the desired operation is achieved, proceed to Section 4, for **System Inspection Instructions**.



Camden
DOOR CONTROLS

5151 Everest Dr. Unit 6
Mississauga, Ontario
L4W 2Z8

Camden Manufacturing

SCALE: NONE DRAWN BY: DGW DATE: 01/14/05 REVISED:

EMF-1 Diagram 2 - ABM Vestibule Connection Diagram

DRAWING No: DRG-EMF-1-0002 FILENAME: EMF_1 DIAGRAM_2.vsd

Section 3B

Set-up Instructions

Bi-Directional Door Sequencer

The EMF-1 is an extremely flexible yet "user friendly" bi-directional door sequencer. All switch inputs, operator and lock outputs have dedicated terminals on the board. Potentiometers provide easy adjustment of all delays for the operators, locks, and sequence delays.

With a single push of a wall switch, the first door (unlocks if so equipped), and opens, then after an adjustable delay, the second door (unlocks if so equipped) and opens. The sequence may be initiated, in reverse, by the opposite wall switch.

An additional feature of this unit is the emergency or *vestibule switch* input. Using the dipswitches, the installer can determine which door(s) open(s) when the center switch is pushed. Choices are exterior only, interior only, both doors simultaneously, or in LOGIC MODE – the door opposite the last switch pushed.

Step 1

Turn the **Mode Selector Switch** to position "3". (See diagram 1).

Step 2

Refer to Diagram 3 (next page) for the following connections.

Pull off the **Input terminal strip** (numbered 1 - 12), and make wiring connections. Re-insert connector.

Pull off the **Relay Output strip** (numbered 1 – 15), and make wiring connections. Use of Relay 5 is optional, and can be activated via the **Relay setting jumper**. (See diagram 1 for location) Re-insert connector.

The **Digital I/O strip** is not used in this application, so no connections are to be made here.

Finally, remove the **Power strip**, and connect Terminals 1 & 2 to your 12 or 24 Volt AC or DC supply. (The terminals *are not* polarity sensitive).

Step 3

Set Dip Switches

Dip switches 1 and 2 control the vestibule switch function. Set as follows:

<u>Switch 1</u>	<u>Switch 2</u>	<u>Door selection</u>
OFF	OFF	Logic Mode
ON	OFF	Door A only
OFF	ON	Door B only
ON	ON	Both Doors

Dipswitch # 3 controls whether or not a held input results in a held output. More precisely, if any switch is pressed **and held**, the doors will (unlock if so equipped), then open (in sequence), and stay open until that switch is released. (Note that this setting only affects the operators, not the locks, which remain timer controlled.)

Set to **ON** (down) if you desire this feature. Set to **OFF** if you want momentary operation. (The benefit of momentary setting is that a stuck switch will not hold the door(s) open unnecessarily).

Switch # 4 must be left in the **OFF** (up) position.

Step 4

Adjustments

IMPORTANT: Any changes to Dip switches, jumpers, and Mode selector settings must be made with power off!

In this application all the pots are active. However, if you are not using the lock outputs, turn Pots 1, 2, 5, & 6 to their minimum settings. Adjust as follows:

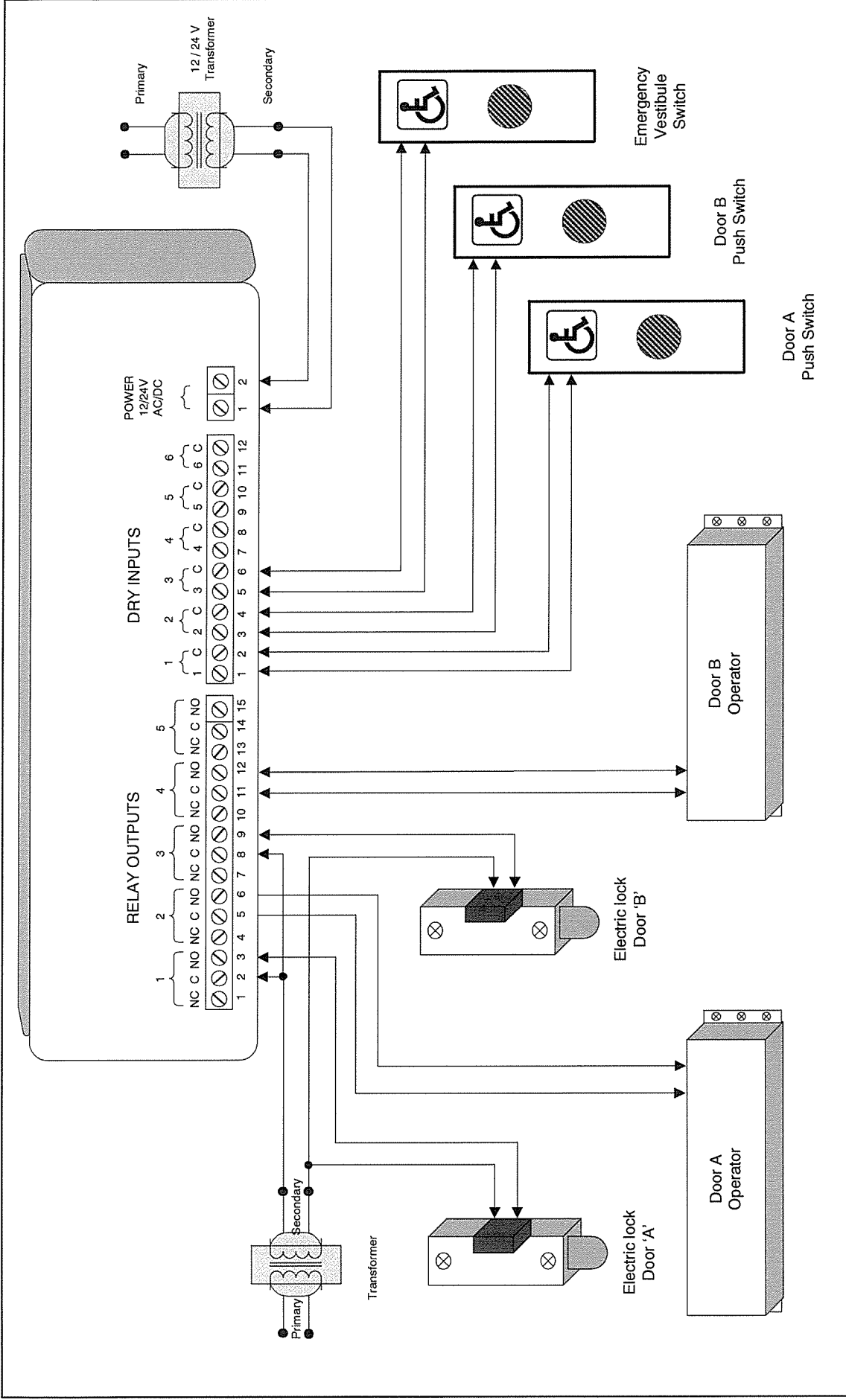
Timer 1	Strike A	Delay-on-Release
Timer 2	Door A	Delay on Operate
Timer 3	Door A	Delay on Release
Timer 4	Sequence Delay	between doors
Timer 5	Strike B	Delay-on-Release
Timer 6	Door B	Delay on Operate
Timer 7	Door B	Delay on Release

Apply power to the EMF-1, door operator, and any applicable activating or locking devices.. Observe the green Power LED on the unit. It should be lit. If not, re-confirm proper voltage and terminal strip connection.

Activate one of the input switches and observe operation. It will likely be necessary to adjust the delay-on-release times for the operators, and also the sequence delay between the doors.

Activate the vestibule (emergency) switch and observe for desired result. If necessary, adjust with Dipswitches 1 & 2.

Once the desired operation is achieved, proceed to Section 4, **System Inspection Instructions**.



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Camden DOOR CONTROLS	Camden Manufacturing	SCALE: NONE	DATE: 01/14/05
DRAWING No: DRG-EMF-1-0003		DRAWN BY: DGW	REVISED:
EMF-1 Diagram 3 Bi-Directional Door Sequencer Diagram			
FILENAME: EMF_1 DIAGRAM_3.vsd			

Section 3C

Set-up Instructions Washroom Door Module

This application is a shared use washroom door in facilities such as nursing homes, hospitals, shopping malls, etc. The relay provides control of the lock, operator, and switches, to provide the utmost in flexibility, safety for the occupants, yet still be easy to install and program.

The door is opened automatically by pressing the exterior wall switch. Pressing the "Push to Lock" button inside then locks the door – the strike is energized, and the exterior switch is removed from the circuit. To exit the washroom, simply push the interior wall switch. The door unlocks, opens and resets the system. Should the door be opened manually, the magnet switch will reset the system.

Unique to the EMF-1 is the emergency input, which allows a panic button to unlock, open the door (optional), and send an emergency signal for assistance. The output can be maintained or pulsed. As an added safety feature, the EMF-1 can be set to automatically reset after 15 minutes time.

Step 1

Turn the **Mode Selector Switch** to position "1". (See diagram 1).

Step 2

Refer to Diagram 4 (next page) for the following connections.

Pull off the **Input terminal strip** (numbered 1 - 12), and make wiring connections. Re-insert connector.

Pull off the **Relay Output strip** (numbered 1 – 15), and make wiring connections. **Note:** Relay # 4 is not used in this application. Use of Relay 5 is optional, and can be activated via the **Relay setting jumper**. (See diagram 1 for location) Re-insert connector.

The **Digital I/O strip** is not used in this application, so no connections are to be made here.

Finally, remove the **Power strip**, and connect Terminals 1 & 2 to your 12 or 24 Volt AC or DC supply. (The terminals *are not* polarity sensitive).

Step 3

Set Dip Switches

Push switch #1 **ON**, (or in down position) for a 15 minute Time-out (reset) feature. Leave in **OFF** position if you *do not* want an automatic reset.

Switch #2 controls Relay #3 (Emergency light or buzzer). Push **ON** for a continuous Panic light, or **OFF** for pulsing. (Pots 2 & 3 control pulse times).

Push switch #3 **ON** when you only want the Panic button to unlock the door *but not open it*. Push switch 3 **OFF** to enable the Panic button to unlock **AND** open the door. Leave switch 4 in **OFF** or up position.

Step 4 Adjustments

In this application, you will use pots 1 – 4. Pots 5 - 7 have no affect.

Timer 1	Operator Delay-on-Release
Timer 2	Pulsing Panic Relay (#3) ON time
Timer 3	Pulsing Panic Relay (#3) OFF time
Timer 4	Operator Delay-on-Activate

Apply power to Door operator, EMF-1, and all connected equipment (ie – strike, lights, etc). Observe the green Power LED on the unit. It should be lit. If not, re-confirm proper voltage and terminal strip connection.

Press the Exterior wall switch. If the washroom is unoccupied the door will open automatically. Pot #1 adjusts the door hold-open time (up to 30 seconds). If the washroom is occupied and the occupant pushed the Lock button, then the door will not open.

After entering the washroom, push the Lock button. The EMF-1 will energize the electric strike (or lock), and remove the exterior Push switch from the circuit.

To exit the Washroom, several options are available:

1. To have the door unlock and open automatically, push the interior Wall switch. This will also reset the EMF-1 for the next person to use.
2. Manual Use. The door may also be used manually. To exit the washroom, turn the (lever) handle and pull (push) the door open. The magnet switch resets the unit into standby mode.

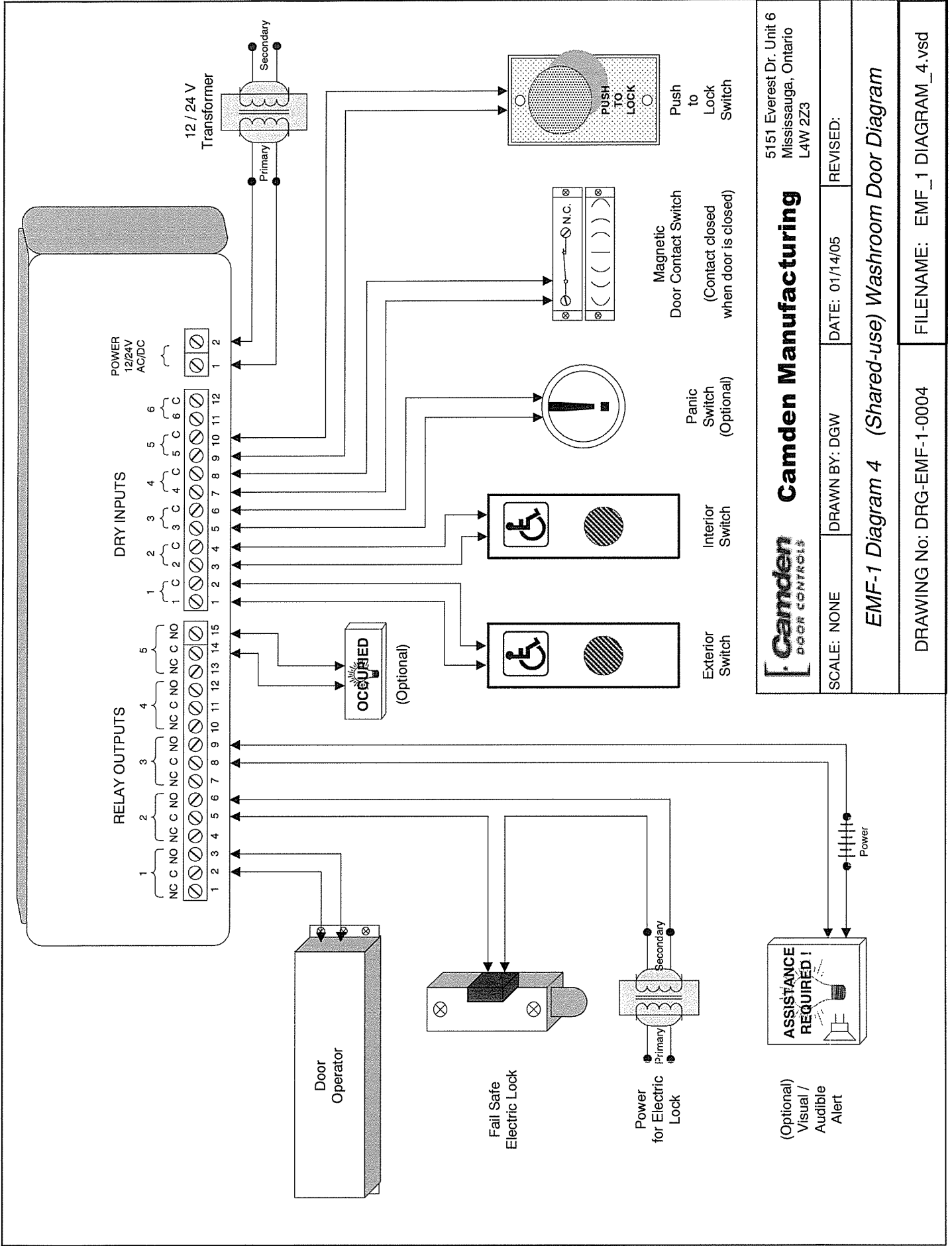
Emergency Panic Switch

Should an emergency occur, and assistance from the outside is required, the occupant can push a button or ribbon switch to signal the EMF-1. When activated, the EMF-1 will unlock then (optionally) open the door. (A maintaining type input is required to keep the door held open).

Further, Relay # 3 is now activated, which can be used to signal for assistance, sound an alarm – whatever you choose. The installer can choose a continuous or pulsing output, depending on the settings of dipswitch # 2, and potentiometers 2 & 3.

Emergency Time-out Feature

An added safety feature in the EMF-1 is the ability to automatically reset to **standby mode** after a fixed lock time of 15 minutes. The door will unlock, so that personnel may enter the washroom. This feature is engaged by turning dipswitch #1 to **ON** position.



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SCALE: NONE	DRAWN BY: DGW	DATE: 01/14/05	REVISED:		
<i>EMF-1 Diagram 4 (Shared-use) Washroom Door Diagram</i>					
DRAWING No: DRG-EMF-1-0004			FILENAME: EMF_1 DIAGRAM_4.vsd		

Section 3D

Set-up Instructions

Man-Trap (Interlock Relay)

This function is designed to control up to 3 sets of sliding, or swinging doors. The relay will allow only 1 door to be open at a time.

It accomplishes this by a **Door Sense** input, such as a magnetic contact switch, located at each door. If the Door Sense determines that a door is open, then it will not allow a second door to open, but **remembers** the request to open and **allows** it once the first door has closed.

For 3 door installations, the EMF-1 will remember an infinite number of open requests and prioritize them in the proper sequence.

As well as a Power-on LED the unit includes 3 relay status LED's.

Step 1

Turn the **Mode Selector Switch** to position "2". (See diagram 1).

Step 2

Refer to Diagram 5 (next page) for the following connections.

Pull off the **Input terminal strip** (numbered 1 - 12), and make wiring connections. Re-insert connector.

Pull off the **Relay Output strip** (numbered 1 - 15), and make wiring connections. **Note:** Relay # 4 is not used in this application. Relay 5 is optional, and can be activated via the **Relay setting jumper**. (See diagram 1 for location) Re-insert connector.

The **Digital I/O strip** is only used if you want remote monitoring.

Finally, remove the **Power strip**, and connect Terminals 1 & 2 to your 12 or 24 Volt AC or DC supply. (The terminals *are not* polarity sensitive).

NOTES: Concerning Magnetic contact switches. This system wants to see a **Normally Closed** connection when the door is closed. The contact will then open when the door opens. Any other configuration will cause the relay to malfunction. We suggest standard door contacts (ie - Entrex Mdl #MDC).

Also, if using only two doors, and not using "Auto Mode", you must insert a jumper in place of Door Magnet C (Terminals 11 & 12).

Step 3

Set Dip Switches

Push switch #1 down, (or in **ON** position) for "**Auto Mode**". In this Mode when Switch A is activated, first Door A opens, then Door B opens in sequence. Conversely, when switch B is activated, first Door B opens, then Door A opens sequentially. A third door cannot be used in "Auto-Mode".

The sequence delay between the two doors is not adjustable on this unit, but is in fact determined by the time it takes for the first door to open and then, completely close. Turn dipswitch #1 **OFF** if this feature is not desired.

Set dipswitch #2 **ON** for N.C. relay contacts (Fail safe). In this setting all 3 relay LED's light immediately (and therefore turn off when the door is triggered). For normal operation, leave dipswitch # 2 up (**OFF**)

Dipswitches 3 & 4 must be left in the **OFF** position.

Step 4

Adjustments

IMPORTANT: Any changes to Dip switches, jumpers, and Mode selector settings must be made with power off!

In this application, you will use pots 4 - 6. Pots 1 - 3 & 7 have no affect.

Timer 4	Door A
Timer 5	Door B
Timer 6	Door C

Output time can be adjusted from 1 - 30 seconds.

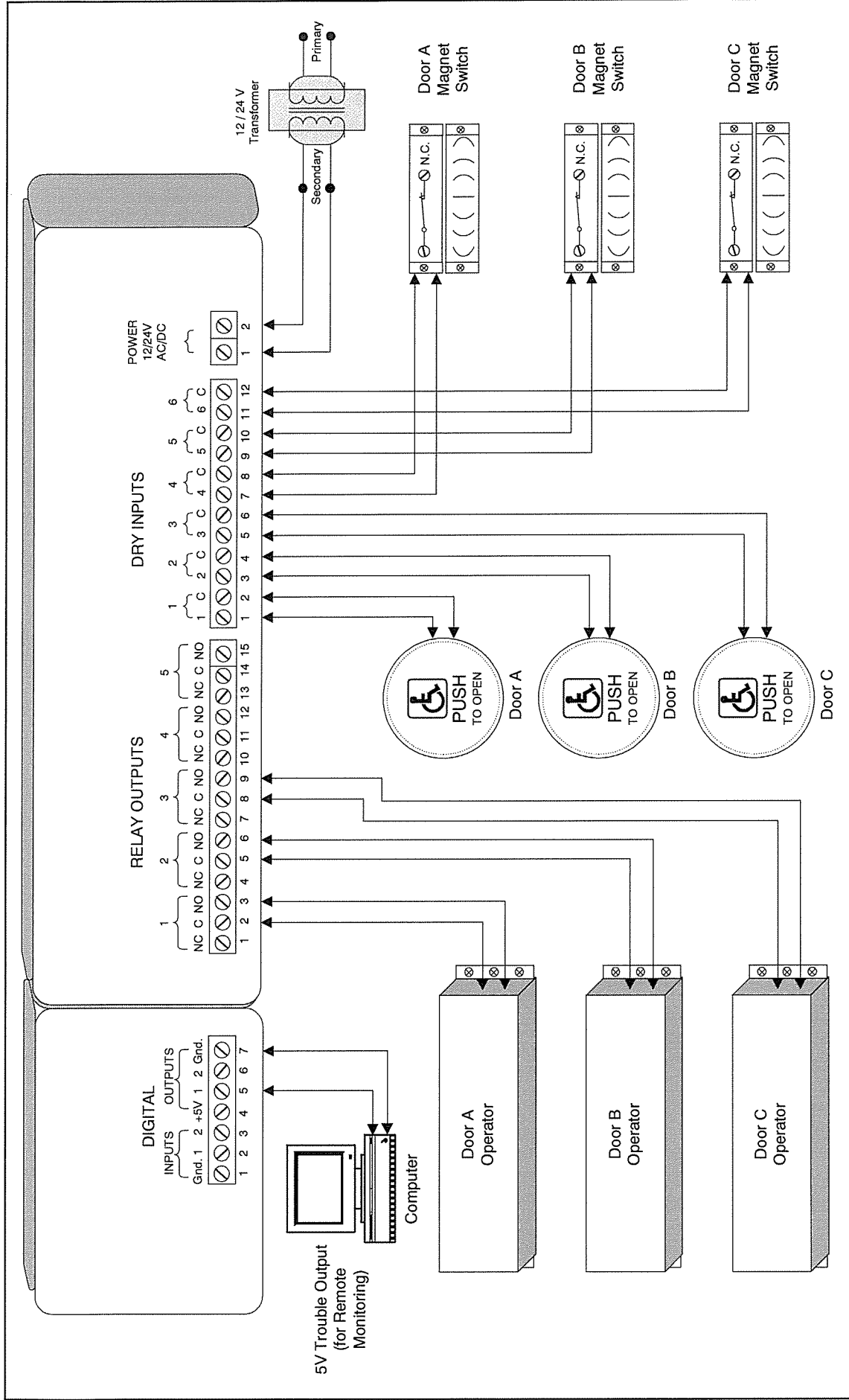
Turn on the power and activate an input device to one of the doors. Observe the respective output LED, which should light immediately. The door should open.

If a request to open comes in from another door while the first is still open, it will retain the call in memory until the **Door Sense** switch indicates the first has closed. If there is a succeeding request on the first door (or the door that is already opened) it will keep that door opened.

If automatic sequential operation between doors A and B is desired, then put dipswitch #1 into **ON** position. Otherwise, for normal operation, leave this dipswitch off.

If failsafe output is desired then you must put dipswitch # 2 into **ON** position.

Once the desired operation is achieved, proceed to Section 4, **System Inspection Instructions**.



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DOOR CONTROLS

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5151 Everest Dr. Unit 6
Mississauga, Ontario
L4W 2Z3

SCALE: NONE DRAWN BY: DGW DATE: 01/14/05 REVISED:

EMF-1 Diagram 5 - Door Interlock Application Diagram

DRAWING No: DRG-EMF-1-0005 FILENAME: EMF_1 DIAGRAM_5_vsd

- NOTES:**
1. This drawing shows a 3 door setup. If using only 2 doors ignore "Door C" operator, switch & magnet, **BUT** insert a jumper from terminal 11 to 12 on INPUT strip.
 2. If using "Auto Mode", only 2 doors **can** be used. Therefore, ignore "Door C" operator, switch & magnet.
 3. For simplicity, activators shown are switches, but alternatively sensors may also be used (Dry contacts only!)
 4. Magnetic contacts must be closed when door is closed, and open when door is open.

Section 4

System Inspection Instructions

After the installation and operational check of the system:

1. Place warning label on the door (as per ANSI A156.10 or A156.19 guidelines). This will advise the person entering the swing side zone that the door will move.
2. Instruct the owner on door system operation and how to test it. This should be checked on a daily basis.
3. Instruct the owner on what to do if the door or any of its components become damaged.
4. Strongly recommend to the owner that the complete entry be inspected twice a year as part of the service agreement.

Section 5

Technical Data

Models	EMF-1 / EMF-1m
Size	EMF-1 6" x 3" x 2" EMF-1m 12" x 7.5" x 3.75"
Mounting	EMF-1 Double sided foam tape EMF-1m 4 x Metal screws & anchors (provided)
Enclosure	EMF-1 Flame retardant ABS EMF-1m Beige Metal Cabinet
Software Version	2.03
Operating voltage	12 / 24 Volts, AC / DC
Current Draw	150 mA nominal, 500 mA max.
Response time	0.3 seconds
Mode Selector	8 position rotary switch
Inputs	6 "dry" contacts, 2 Digital inputs
Outputs	5 SPDT relays 2 Digital outputs
Relay contact rating	3 amps @ 20 VDC
Time Delays	7 pots, adjustable from 1 to 30 seconds (depending on mode selected)
Electrical Life	100,000 operations @ rated capacity 500,000 operations @ ½ rated capacity

Section 6

Warranty

Camden Door Controls guarantees the EMF-1 (or EMF-1m) to be free from manufacturing defects for 3 years from date of sale. If during the first 3 years the CX-EMF-1(m) fails to perform correctly, it may be returned to our factory where it will be repaired or replaced (at our discretion) without charge. Except as stated herein, Camden extends no warranties expressed or implied regarding function, performance or service.

Questions?

Call us toll-free at 1-877-226-3369

Filename: CX-EMF-1 Instructions.doc
Revision: 6/05/2006 11:31 AM

