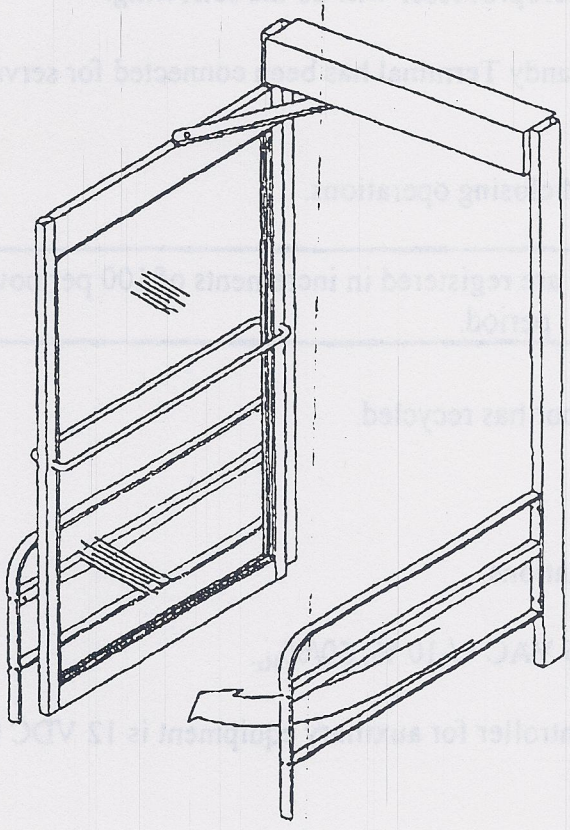
Microprocessor and Handy Terminal

Setup and Programming Manual

for Swinging Door Systems



P/N 159318.03
Q:\Manual Packages\Microprocessor Swing Door\mcandhan
November 9, 1998 Revision

U10

The manufacturer, NABCO Entrances, Inc. suggests that this manual be given to the building owner for future references. Additional copies are available from the factory.

I. Product Introduction

A. The NABCO Entrances Microprocessor controller is on the leading edge of technology for automatic door operation and control. These units provide 20 operational functions with more than 150 different options. In addition, an auxiliary output signal is available to further customize door operation in accordance with applicable standards.

B. The companion Handy Terminal is used to make controller adjustments quick and easy. The Handy Terminal is powered directly from the Microprocessor, eliminating the need for batteries. (See Figure 1).

NOTE: The microprocessor can be used with the Handy Terminal for sliding, swinging and folding door applications. Since there are some specific differences in set-up procedures, and operation for each type of door, consult the instruction manual for the unit being installed.

C. The Handy Terminal along with Microprocessor will do the following:

1. Count the number of times the Handy Terminal has been connected for service and tracking.

2. Count the number of opening and closing operations.

NOTE: The opening and closing counts are registered in increments of 100 per power-on period.

3. Count the number of times the door has recycled.

4. Maintain a runaway count

D. Microprocessor Controller Specifications

1. The required power source is 115 VAC +/-10 %, $50/60_{Hz}$.

2. The power available from the controller for auxiliary equipment is 12 VDC 0.5 amps.

3. The recommended operating temperature range is -4 to 140° Fahrenheit (-20 to +60° Celsius).

4. The maximum recommended door opening force is 300 pounds which is dependent on door weight, hinge friction, and wind loads.

5. The hold open time delay range can be anywhere between 0 to 67 seconds.

6. The door movement range for a swinging door leaf is 0° to 120°.

7. The back check and latch range for a swinging door leaf is 5° to 15° of door swing.

II. Signal Sensor Options

A. Wiring (All wires are labeled and identified by color)

1. Wire 9DC12V (brown) is an Acusensor and Acuswing power source. The output is 12 VDC with a maximum capacity of 0.5 amps.

2. Wire 7 (red) provides common ground for the 12 VDC power source.

3. Wire 61 (black) is the activation signal input and will open the door based on a signal from the Acuswing, the Acusensor, mat or motion detectors.

CAUTION: When an Acuswing system is used, only the Acuswing's signal must be connected to this wire. Other signals must be connected to wire 62 (orange).

4. Wire 6B (white) is for holding beams.

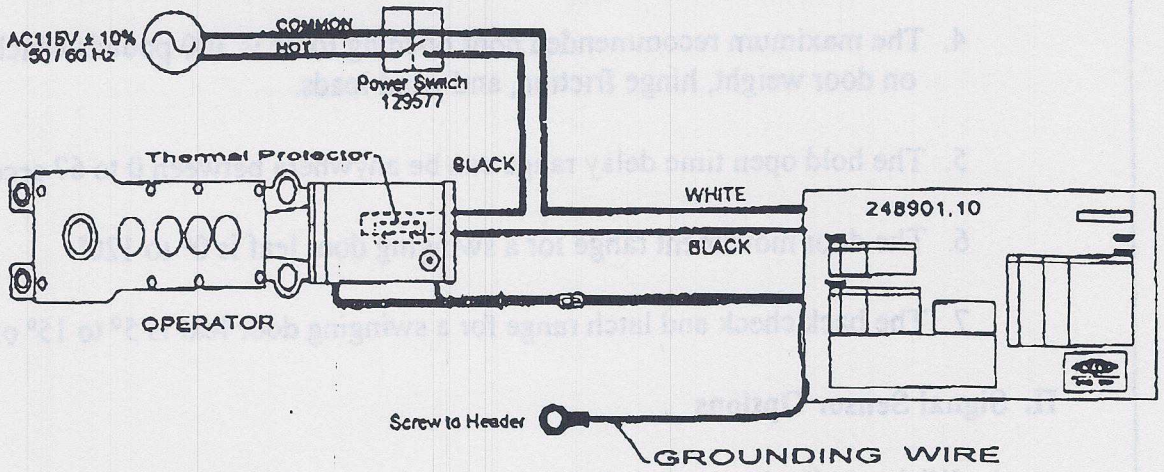
5. Wire H (green) is the safety mat signal and lockout for swing-side sensors.

6. Wire M0 (orange) is the mode input switch one (SW1), used to achieve special functions (See Section II.B.).

7. Wire M1 (orange) is the mode input for switch two (SW2), used to achieve special functions (See Section II.B.). If an electric lock is used, the wire will signal the lock to engage or retract (one or two-way mode).

8. Wire 62 (orange) is the activation signal input and will open the door based on a signal from the Acusensor, mat or motion detectors from the swing side.

NOTE: For Acuswing systems, this input is for approach traffic.



WIRING DIAGRAM FOR POWER AND GROUNDING
Figure 2

9. Wire SQ (yellow) is for sequential door operation. Activate once to open and once to close the door.

10. Wire BA (blue) will stop door operation if the door is broken or panicked open (when disconnected with wire 7 red). This feature should always be included in the in-swing door.

CAUTION: Do not unplug blue jumper-plugs when panic switches are not used. Unplug the door to stop operation.

11. Wire OUT+ (violet) is the positive auxiliary output, used as a switch with a maximum rating of 24VDC and 50mA for an outside power source. When listed with wires one, two and twelve, it can supply 12 VDC and a maximum of 50mA of power.

12. Wire OUT- (gray) is the negative auxiliary output, rated to a maximum of 24 VDC and 50mA. This is the ground negative for output wire OUT+ (violet). CAUTION: This wire must be used with wire OUT+ (violet). Incorrect wiring will cause auxiliary signal output failure.

B. Modes

NOTE: All references to the mode switches are made in connection with the ground (red wire).

1. With the rocker switch in the **ON** mode, the blue wires are closed throughout the circuit. This is a closed-loop circuit. If the blue wires are at any time open, the door operation stops.

2. With the rocker switch in the **OFF** mode, the blue wires are open. The door operation will stop.

3. The door is in **HOLD OPEN** mode when M0 and M1 are on. No activation is needed when this selection is made. (Requires an optional rocker switch)

C. Before turning on power....

1. Make sure all parts are wired properly. (See Figure 2).

NOTE: The exceptions are the mode switches which must be set in the on mode, then reset for the desired options after Handy Terminal setup.

2. Make sure the power source is 115 VAC +/- 10 percent.

3. The controller will be damaged if the power is switched on and off too quickly. After switching off the power, wait 10 seconds before switching it on.

4. Long term exposure to temperatures colder than - 4° Fahrenheit, without power should be avoided. Temperatures below -20° Fahrenheit may cause erratic behavior.

5. In the event of a power surge, which may cause a fuse failure, the fuse can be replaced. The power should be disconnected before removing the cover to replace the fuse. Do not attempt to repair the Microprocessor.

III. Normal Setup and Programming Procedures

Note: The factory settings are reasonable, but not mandatory, for door operation. Each option should be reviewed carefully. Be sure the door is operating according to applicable ANSI controlling standards and contract specifications before releasing the entrance to the owner.

A. Microprocessor setup involves correct wiring of the unit followed by door operation setup, (door stroke and speed settings).

1. Plug the Handy Terminal into the corresponding Microprocessor connector.

2. Turn on the power and note the direction of movement. The door should stay closed.

3. If the door opens slowly, it has been set up with the wrong hand. If this is the case, turn off the power and insert the handing harness between the Microprocessor and operator. After waiting a few seconds, turn on the power. Note the direction of movement. The door should now stay closed.
4. After the power is turned on, the Handy Terminal will act as a guide for set-up procedures and Microprocessor programming. There will be a series of displayed messages and a list of acceptable options.

5. Choose an option by placing the cursor over the option and pressing the ENTRY button. Follow these four steps as prompted by Handy Terminal messages to initially set up the door.

   a. When the message reads SLIDE/SWING/STRK, move the cursor to the Y position and press ENTRY.

   b. When the message reads SWING DOOR Y- N, move the cursor to Y and press ENTRY.

   c. When the message reads PUSH TEST, press TEST. Wait while the Handy Terminal provides another message.

NOTE: The factory settings are reasonable, but not mandatory, for door operation. Each option should be reviewed carefully. Be sure the door is operating according to applicable ANSI controlling standards and contract specifications before releasing the entrance to the owner.

d. For units with Acuswings and Automatic Reset Boxes, please skip to step d-ii below. For all other types of swing door systems:

I.

(1) When the display indicates it is ready to accept new input, press TEST.
(2) The Handy Terminal will provide the message DURING A TEST JUST A MOMENT.
(3) After the test is done, the display returns to the same indication as (1).

ii. For Acuswings Only:

(1) After the message reads STD FUNCTION, press ENTRY until the message reads SPECIAL FUNCTION.
(2) Move the cursor to the Y position and press ENTRY until the message reads AUX. OUTPUT.
(3) Move the cursor to the 3 position and press ENTRY.
(4) Disconnect the Handy Terminal.
(5) Power will be supplied to the Acuswings and the door will open and close slowly while the Acuswings learn the background.
(6) When the door reaches the closed position and the color of the LEDs on the Acuswings turn to green, the Acuswings are ready to operate.
(7) If you want to test the door, plug the Handy Terminal and press TEST (It does not matter what the message reads).
(8) The Handy Terminal will provide the message: DURING A TEST JUST A MOMENT while a test is being done.
(9) After the test is done, the display returns to the same indication as (7).

IV. Disconnecting the Handy Terminal

CAUTION: Failure to follow the disconnecting procedures may result in total loss of communication between the microprocessor and Handy Terminal.

A. The Handy Terminal can be disconnected after the last test has been completed and the display has been stabilized. This process normally takes a few seconds after the display indicates it is ready to accept new input from the Handy Terminal. After the time lapse, the Handy Terminal can be disconnected.

B. If power to the Microprocessor needs to be cut off, wait an additional 5 seconds after the Handy Terminal is disconnected. C. The door should now operate based on the pre-set settings shown in the following table. If changes are desired, go to section V.

Factory Settings of Adjustable Functions Table

Adjustable Function	Factory Setting	Range
Standard Function Adjustments		
Opening Speed	3	0 - 7
Closing Speed	2	0 - 7
Time Delay	2	0 - 7
Feeling Adjustments		
Start Power	3	0 - 7
Check Power	6	0 - 7
Reaction Power	4	0 - 7
Back Check Speed	1	0 - 3
Latch Check Speed	1	0 - 3
Special Function Adjustments		
Hold Close	N	Yes or No
Signal at Closing	Y	Yes or No
Signal at Full Open	Y	Yes or No
Manual Opening	3	0 - 3
Signal Slow	N	Yes or No
Recycle	Y	Yes or No
Recycle Sensitivity	1	0 - 3
After Recycle	Y	Yes or No
Auxiliary Output**	0	0 - 3
Output Timer***	0	0 - 3
Extended Time Delay	7	0 - 7

**When the Acuswings and the automanc reset box are installed, "Auxiliary output" must be "3".

***The output timer selection is required only when selecting zero or two on the auxiliary output.

NOTE: Adjustments must be made if the door is not operating in accordance with applicable ANSI standards.

V. Adjustment Procedures

A. Standard Function Adjustments

1. Make sure the Handy Terminal is in the standard functions program located after normal setup. The message STD FUNCTION Y N will appear. Enter Y to start the standard functions program or N to bypass this program and proceed to the next .
2. There are three categories of standard functions
   - **Opening Speed** - The message will read OPEN SPEED 3. Eight options are available from 0 to 7. Seven is the fastest.

NOTE: Set all door speeds to comply with ANSI standards.

   - **Closing Speed** - The message will read CLOSE SPEED 2. Eight options are available from 0 to 7. Seven is the fastest..
   - **Time Delay** - The message TIME DELAY 2 will appear. Eight options are offered with time delays of 0 to 7 seconds.

NOTE: Additional time delays are possible through special function adjustments.

B. Feeling Adjustments

1. The message FEELING ADJUST? will appear. Enter Y to begin and N to bypass.
2. There are five available feeling adjustments:
   - **Start Power** - The message will read START POWER 3. This is the power used to accelerate the door at the start of the opening and closing cycles. Eight options are offered. Option 0 is the slowest acceleration and option 0 should be used where high speed operation for opening is desired.
   - **Check Power** - The message will read CHECK POWER 6. This adjusts braking power to reduce door speed to the check or latch speed. Eight options are offered. Zero provides gradual braking, and 7 provides fast braking.
   - **Reaction power** - The message will read REACTION POWER 4. This is a reaction operation. It controls how fast the door will react to an activating signal (i.e., how long it takes the closing door to reopen fully.

Eight options are offered. Zero provides the slowest reaction, 7 the fastest.

- **Back Check Speed** - The message will read BACK C. SPEED 1.
  Four options are offered. The 0 is the slowest setting and 3 is the fastest.

- **Latch Check Speed** - The message will read LATCH C. SPEED 1.
  Four options are offered. The 0 is the slowest setting and 3 is the fastest.

C. Special Function Adjustments

1. The message will read: SPECIAL FUNCTION. Enter Y to adjust the special functions or N to bypass the program.

2. There are 10 adjustments:

   - The message will read HOLD CLOSE N.
     When using the motor the spring force assists to keep the door closed. Option N closes the door only with spring force.

NOTE: The spring force may not be enough to keep the door closed in windy conditions.

   - The message will read SIG. AT CLOSING Y.
     During the closing cycle the door will reopen or keep closing, depending on how this function is set. Choose Y and the door will keep closing when H (green) wire and 61 (black) or 62 (orange) are active. Activation is ignored. The door keeps closing. Choose N and the door will reopen when H (green) is active *and* 61 or 62 is active. 61 or 62 must be active in order for an active H to open the door.
     This option can be used as a lockout with the GREEN wire for swing-side sensors. Acurail systems use this input with the Handy Terminal programmed for SIG. AT CLOSING N. For the lockout circuit to work correctly, SIG. FULL OPEN must be set to Y.

CAUTION: When the Acuswings are used, Y must be selected.

   - The message will read SIG. FULL OPEN Y.
     Choose Y and the door stays open. Choose N and the door will close from the open position, even if the H (green) signal is active after the time delay expires. See the chart on the next page for Wire 6B (White) and Wire H (Green).

Wire 6B (White) *ACTIVE* Signal Table

	Door Status	SIGNAL SLOW: Y	SIGNAL SLOW: N
SIG. AT CLOSING: Y	Closed	Stays closed	Stays closed
	Opening	Slows down	Stops. After 6B signal is lost, door opens slowly
	Open	N/A	N/A
	Closing	N/A	N/A
SIG. AT CLOSING: N	Closed	Stays closed	Stays closed
	Opening	Slows down	1. Between closed and back-check: Stops and then closes slowly after the time delay plus 5 seconds expires 2. Between back-check and fully open: keeps opening
	Open	Stays Open	Stays Open
	Closing	Slows down	1. Between open and latch-check: Stops and then closes slowly after the time delay plus 5 seconds expires 2. Between latch-check and fully closed: keeps closing

Wire H (Green) *ACTIVE* Signal Table

	Door Status	SIG. FULL OPEN: Y	SIG. FULL OPEN: N
SIG. AT CLOSING: Y	Closed	Stays closed	Stays closed
	Opening	N/A	N/A
	Open	Stays open even if the time delay expires	Closes after the time delay expires
	Closing	Keeps closing even if an activation signal is received	Keeps closing even if an activation signal is received
SIG. AT CLOSING: N	Closed	Stays closed	Stays closed
	Opening	N/A	N/A
	Open	Stays open even if the time delay expires	Closes after the time delay expires
	Closing	Reopens when an activation signal is received	Reopens when an activation signal is received

- **Manual Open** - The message will read: MANUAL OPEN 3.
  After the unit has been completely set up and is operating, a choice is offered on how the door will act if manually opened. This may occur because the activating device was not used or did not operate properly. There are four options:
  0 - The door will close slowly by spring power.
  1 - Opening the door manually from a closed position will activate the door to power open. Not a push to go, but push to start.
  2 - The door will close slowly by spring power.
  3 - The door will close slowly by motor power.

- **Signal Slow** - The message will read: SIGNAL SLOW N.
  Choose Y and the door slows down when 6B (white) is signaled during an opening cycle. Choose N and the door stops when signaled. After the signal runs out, the door opens slowly (for Acuswings, not for Acurail).

- **Recycle** - The message will read: RECYCLE? Y.
  This allows adjustment when the door encounters an obstacle during the closing cycle. Choose Y and the door opens, choose N and the door stops (the door will open by the activating signal.)

- **Recycle Sensitivity** -The message will read: RECYCLE SENS. 1.
  It adjusts the sensitivity of force causing the door to recycle. Four options: 0 is softest, 3 is hardest.

Note: The recycle sensitivity must be set to meet ANSI and UL closing force requirements.

- **After Recycle** - The message will read: AFTER RECYCLE Y.
  This adjusts for operation after the door reaches the full open position caused by the recycle. Choose Y and the door will close after the time delay expires. Choose N and door stays in the open position; it will take another activating signal for it to time out and close.

- **Auxiliary Output** - The message will read: AUX. OUTPUT 0. This will determine when a signal (from wires OUT+ and OUT-) is sent for the operation of the electric lock, another controller, relay or other device. There are four options:

0 - The electric lock option enables operation of the electric lock and time delay between release of the lock and door movement. The message will read: OUTPUT TIMER 0.

Note: The time delay selected for the lock release will also be used as the time delay to set the lock after arriving at closed position.

This option has several sub options should be selected from four options:

- 0 - ¼ second
- 1 - ½ second
- 2 - 3/4 second
- 3 - 1 second

1 - The air lock option will instruct the Microprocessor to prevent the second door from opening until the first door is closed, in a passageway situation.

2 - The sequential door operation option requires selecting the time delay between the first and second door operations. The message will read: Output Timer - 0. Four sub options are offered:

- 0 - Two seconds
- 1 - Four seconds
- 2 - Six seconds
- 3 - Eight seconds

3 - **(Acuswing system only)** Selection of this option enables the Microprocessor to reset the Acuswings automatically with the automatic reset box when they are in warning conditions and need re-calibration.

CAUTION: If another option is selected, the Microprocessor will not supply power to the Acuswings.

- **Extended Time Delay** - The message will read: EXT. TIME DELAY 7. It enables an extended time delay beyond the zero to seven seconds standard. Time delay is measured after the loss of the activation signal. There are eight options.

0- The standard 0 to 7 second delay
1 - 10 seconds longer than standard (10-17 seconds)
2- 20 seconds longer (20-27 seconds)
3- 30 seconds longer (30-37 seconds)
4 - 40 seconds longer (40-47 seconds)

5 - 50 seconds longer (50 - 57 seconds)
6- 60 seconds longer (60 - 67 seconds)
7 - The door will open to the full open point before closing even if the time delay has expired during the opening cycle. The standard time delay of 0 to 7 seconds applies after the door reaches the open position.

VI. Troubleshooting

A. *The door is recycling on its own.*

1. Check if the Acusensors are sensing (seeing) something causing reactivation.

2. With the rocker switch selected to STOP mode, be sure that the door moves freely open and closed without obstructions or binding.

B. *There was a power failure.*

1. A power failure lasting less than one second will not affect operation.

2. A power failure of one second or more will cause the Microprocessor to brake the door fully. The door will stop in the position it's at when the power failed.
3. When the power is turned on, the Microprocessor will operate. Settings to the door operation remain in effect. One activation is required to start the sequence.

C. *There was trouble detected by the controller.*

1. For the following problems the Microprocessor will stop the door and memorize the nature of the trouble. The Microprocessor will not operate the door until the Handy Terminal clears the problem. When the Handy Terminal is connected, there will be a message:

   Error Check Y - N
   Choose Y to clear

   I. The message may read: **STROKE ERROR**. This means the microprocessor has sensed movement longer than the adjusted stroke or the motors' encoder has an failed. Check the timing belt and readjust the door stroke. If re-stroke fails, replace the motor.

   II. The message may read: **RAM ERROR Y - N**. Select Y, Entry, to clear error message. Try normal operation. If operation fails, the Microprocessor needs replacing.

   III. The message may read: **EEPROM ERROR Y- N**. The unit can't read or write data. Select Y, Entry, to clear error message. Try normal operation. If operation fails, the Microprocessor needs to be replaced.

C. *There was trouble detected by the controller* (Continued)

2. If the Microprocessor does not operate at all, check the wiring, connections, and activation devices. Connect the Handy Terminal for an error message, clear and repair. Check the power supply, fuse and motor wiring/encoder, or change out the motor. The final option would be to change the Microprocessor.

D. *There are problems with the general door operation.*

1. If the door does not open at all, check the sensor wiring and actuating sensor. Connect the Handy Terminal and try TEST key.

2. If there is abnormal door operation, the motor (red and black) wiring may need to be exchanged. Check or reset the stroke and install the handing harness where needed. Check the Handy Terminal settings. Note: The settings may not have been received by the Microprocessor or the door may have been set up as a slider instead of a swinger.

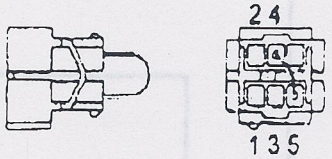
E. *Handy Terminal message, GYRO TECH HANDY TERMINAL but does not change.*

1. Check if you have the mode switch installed and set to ON position. If a mode switch is not used be sure the jumper for the mode switch is in place.

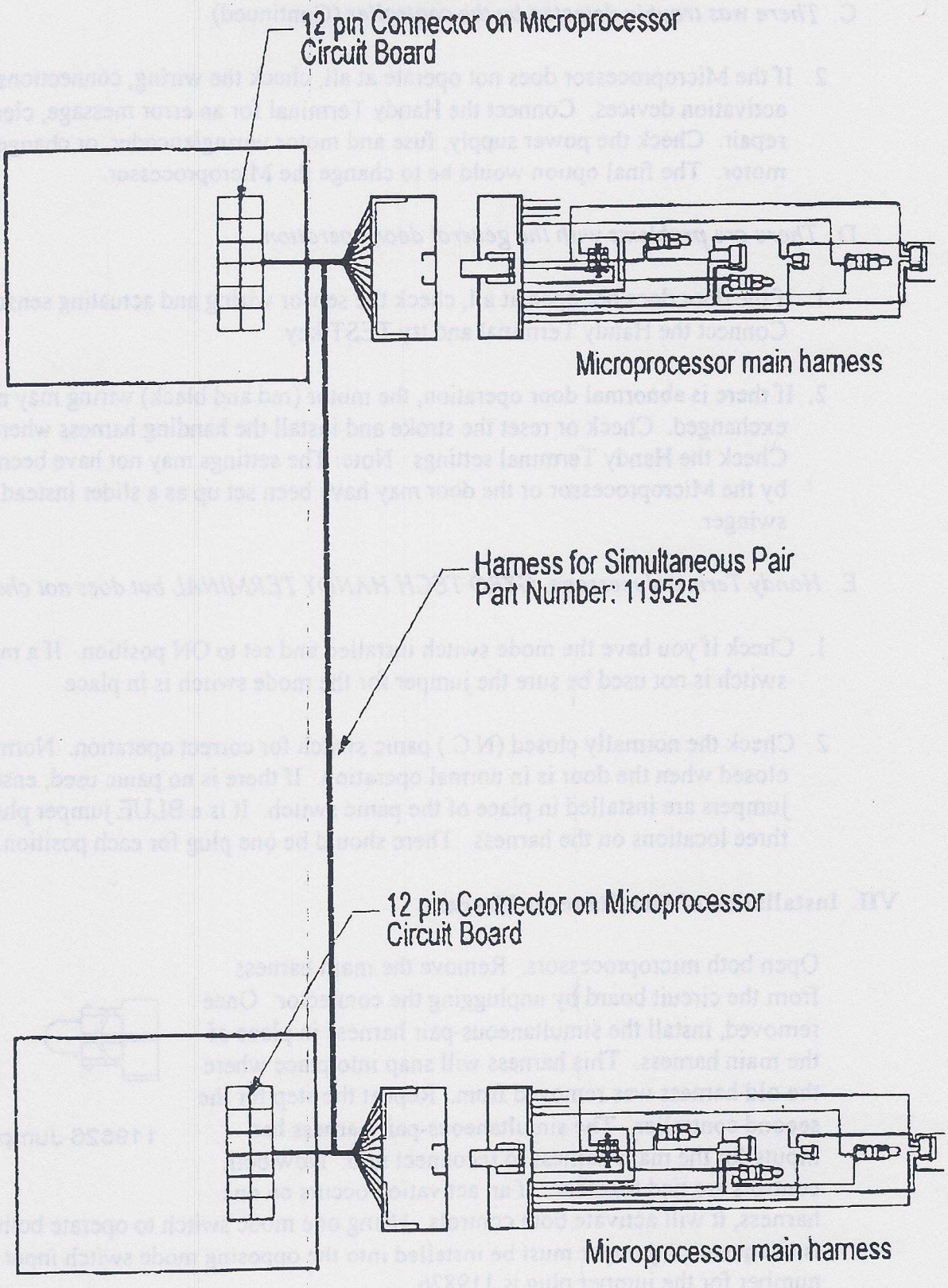
2. Check the normally closed (N.C.) panic switch for correct operation. Normally closed when the door is in normal operation. If there is no panic used, ensure the jumpers are installed in place of the panic switch. It is a BLUE jumper plug used in three locations on the harness. There should be one plug for each position.

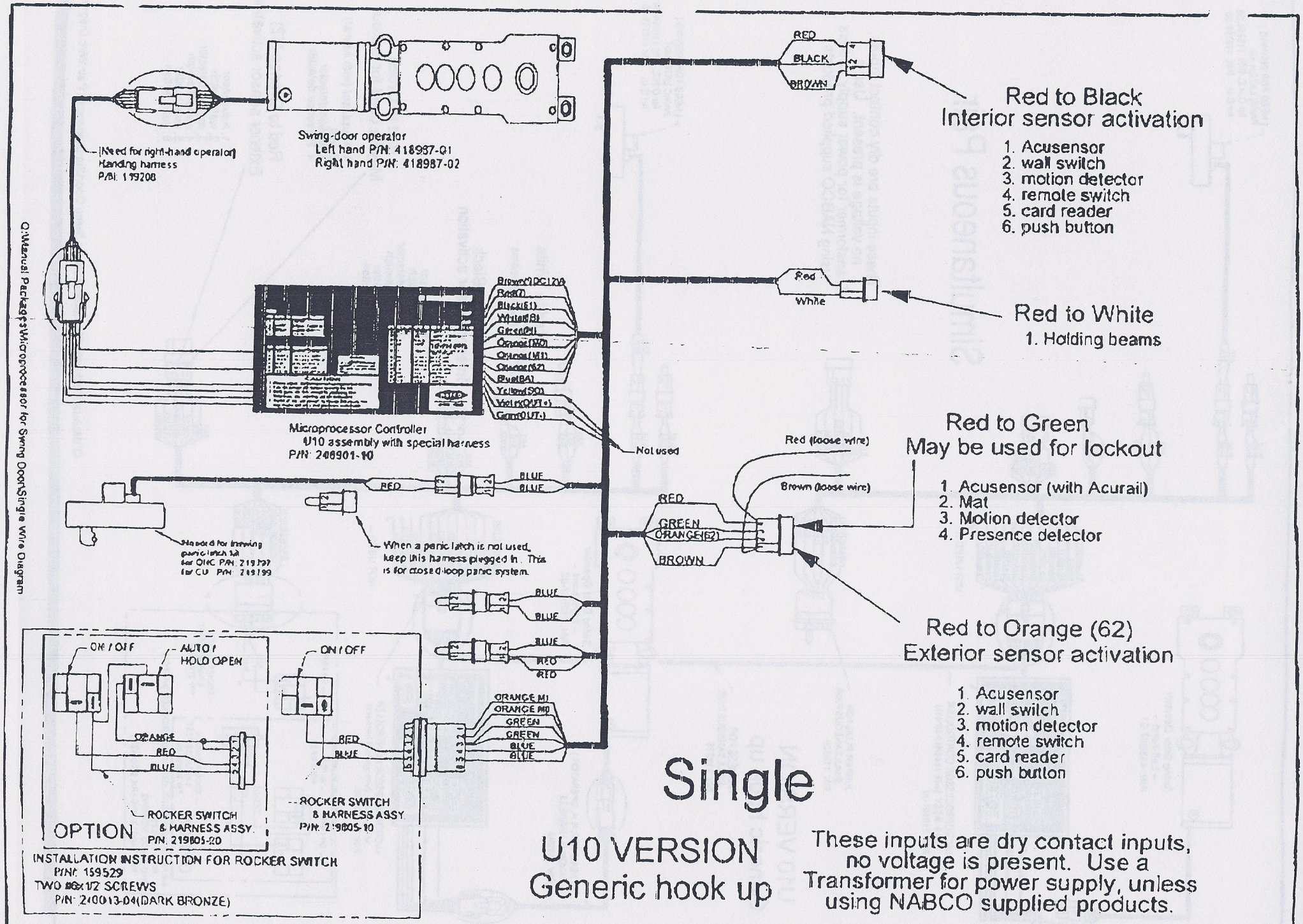
VII. Installation of Simultaneous Harness:

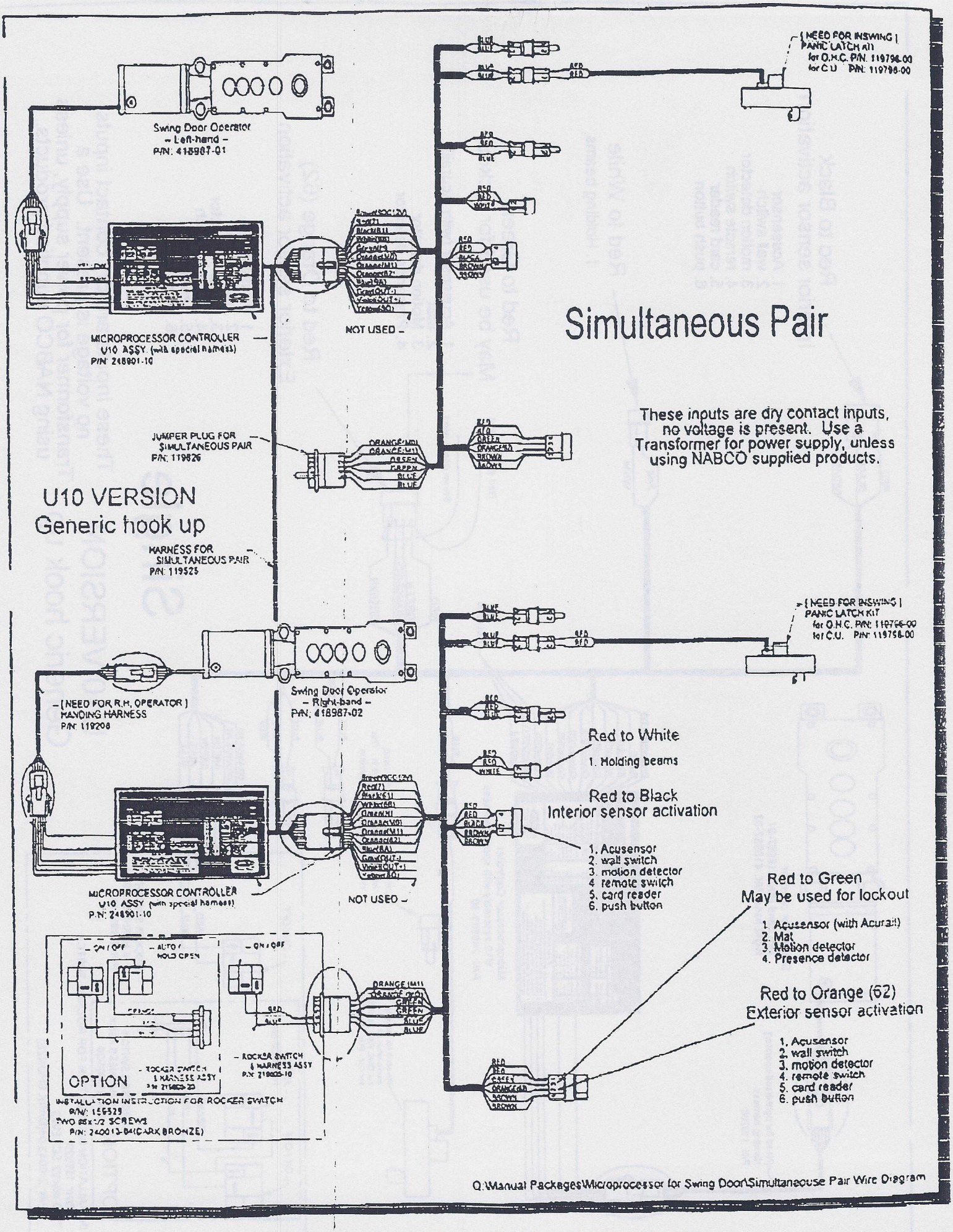
Open both microprocessors. Remove the main harness from the circuit board by unplugging the connector. Once removed, install the simultaneous-pair harness in place of the main harness. This harness will snap into place where the old harness was removed from. Repeat the step for the second controller. The simultaneous-pair harness has inputs for the main harness to reconnect into. Now both controls are tied together. If an activation occurs on one harness, it will activate both controls. Using one mode switch to operate both controls is adequate. A jumper must be installed into the opposing mode switch input. The part number for the jumper plug is 119826.



119826 Jumper Plug


12 pin Connector on Microprocessor Circuit Board
Microprocessor main harness
Harness for Simultaneous Pair Part Number: 119525
12 pin Connector on Microprocessor Circuit Board
Microprocessor main harness


Swing-door operator
Left hand P/N: 418987-01
Right hand P/N: 418987-02
(Need for right-hand operator)
Handing harness
P/N: 159208
Microprocessor Controller
U10 assembly with special harness
P/N: 246901-10
Not used
When a panic latch is not used, keep this harness plugged in. This is for closed-loop panic system.
ON / OFF
AUTO / HOLD OPEN
ROCKER SWITCH & HARNESS ASSY. P/N: 219805-20
OPTION
ROCKER SWITCH & HARNESS ASSY. P/N: 219805-10
INSTALLATION INSTRUCTION FOR ROCKER SWITCH
P/N: 159529
TWO #6x1/2 SCREWS
P/N: 240013-04(DARK BRONZE)
Red to Black
Interior sensor activation
1. Acusensor
2. wall switch
3. motion detector
4. remote switch
5. card reader
6. push button
Red to White
1. Holding beams
Red to Green
May be used for lockout
Red (loose wire)
Brown (loose wire)
1. Acusensor (with Acurail)
2. Mat
3. Motion detector
4. Presence detector
Red to Orange (62)
Exterior sensor activation
1. Acusensor
2. wall switch
3. motion detector
4. remote switch
5. card reader
6. push button
Single
U10 VERSION
Generic hook up
These inputs are dry contact inputs, no voltage is present. Use a Transformer for power supply, unless using NABCO supplied products.
Q:\Manual Packages\Microprocessor for Swing Door\Single w\o Diagram


Swing Door Operator
– Left-hand –
P/N: 418987-01
MICROPROCESSOR CONTROLLER
U10 ASSY. (with special harness)
P/N: 248901-10
– NOT USED –
JUMPER PLUG FOR
SIMULTANEOUS PAIR
P/N: 119826
HARNESS FOR
SIMULTANEOUS PAIR
P/N: 119525
– (NEED FOR INSWING)
PANIC LATCH KIT
for O.H.C. P/N: 119796-00
for C.U. P/N: 119796-00
Simultaneous Pair
These inputs are dry contact inputs, no voltage is present. Use a Transformer for power supply, unless using NABCO supplied products.
U10 VERSION
Generic hook up
– (NEED FOR R.H. OPERATOR)
HANDING HARNESS
P/N: 119208
Swing Door Operator
– Right-hand –
P/N: 418987-02
– (NEED FOR INSWING)
PANIC LATCH KIT
for O.H.C. P/N: 119796-00
for C.U. P/N: 119796-00
Red to White
1. Holding beams
Red to Black
Interior sensor activation
1. Acusensor
2. wall switch
3. motion detector
4. remote switch
5. card reader
6. push button
Red to Green
May be used for lockout
1. Acusensor (with Acura-II)
2. Mat
3. Motion detector
4. Presence detector
Red to Orange (62)
Exterior sensor activation
1. Acusensor
2. wall switch
3. motion detector
4. remote switch
5. card reader
6. push button
MICROPROCESSOR CONTROLLER
U10 ASSY (with special harness)
P/N: 248901-10
– NOT USED –
– ON / OFF
– AUTO / HOLD OPEN
– ON / OFF
OPTION
– ROCKER SWITCH & HARNESS ASSY
P/N: 219005-10
INSTALLATION INSTRUCTION FOR ROCKER SWITCH
P/N: 156529
TWO #8x1/2 SCREWS
P/N: 240013-84 (DARK BRONZE)
Q:\Manual Packages\Microprocessor for Swing Door\Simultaneouse Pair Wire Diagram