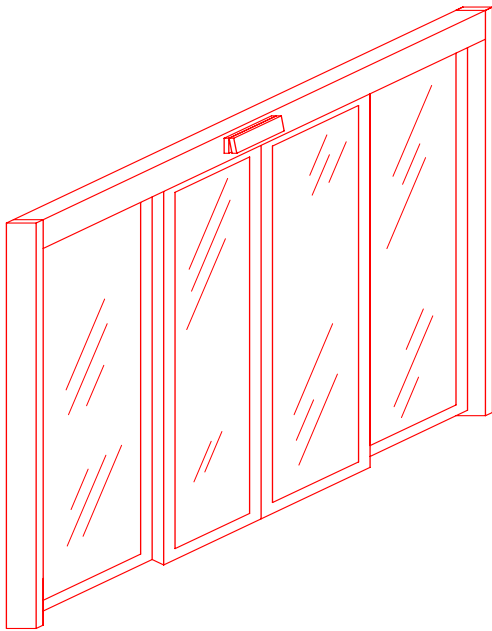


**Microprocessor and Handy Terminal**

# **Setup and Programming Manual**

***Versions U04 to U19***

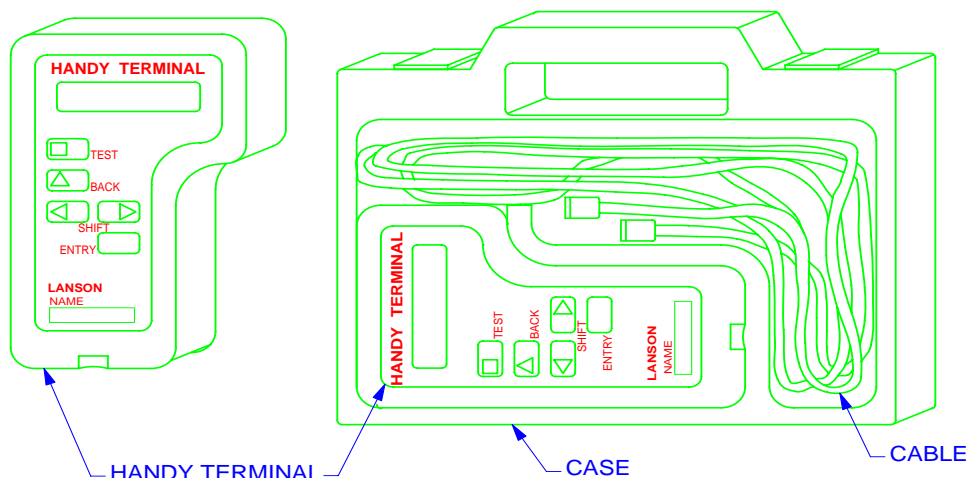


**for  
Sliding  
Door  
Systems**

*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, Inc. **Microprocessor** controller is leading edge technology for automatic door operation and control. These units provide 20 different 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. It is connected directly to the Microprocessor, eliminating the need for batteries. The unit is light, compact, and easy to hold with one hand (See Figure 1).



**PART No. 148903**

### **HANDY TERMINAL**

Figure 1

**NOTE: The Microprocessor can be used with the Handy Terminal for swing 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. To aid in the door's management, the 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 counts are registered in increments of 100 per power-on period.**

3. Count the number of times the door has recycled.
4. Maintain data under the history data program.

D. Microprocessor controller specifications

1. The required power source is 115 VAC +/-10 %, 50/60 Hertz.
2. The power available from the controller for auxiliary equipment operation 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 weight is 300 pounds total (i.e. 150 pounds each for a bi-part and 300 pounds for a single).
5. The hold-open time delay range is 0 to 67 seconds.
6. The door movement range for a slider is 4 to 137 inches (100 to 3500 millimeters).
7. The back check range for a slider is 2 to 4 inches (50 to 100 millimeters).
8. The allowable range for the limited door opening feature is 4 to 137 inches (100 to 3500 millimeters).

## II. Signal sensor options

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

1. Wire 9DC12V (brown) is an Acusensor 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 Acusensor, mat or motion detectors.
4. Wire 6B (white), the holding beam input, will open a closed door when the holding beam signal is activated. This can be changed, using the Handy Terminal, to have the door remain in closed position.
5. Wire H (green) is the reduced opening input setup with the Handy Terminal. It enables reduced door opening when wired to a switch and activated.

6. Wire M0 (orange) is the mode input switch one (SW1), used to achieve special functions (See Section II, Item B on modes).
7. Wire M1 (orange) is the mode input for switch two (SW2), used to achieve special functions (See Section II, Item B on modes). If an electric lock is used, the wire will show the lock's status.
8. Wire 62 (orange) allows the approach-through activating signal to hold open or reopen the door from any position until the door is full closed.

**NOTE: This feature should be used with one-way traffic mode only.**

9. Wire SQ (yellow) allows a sequence of signals to open and close the door.
10. Wire BA (blue) will stop door operation if the door is broken or panicked open.
11. Wire OUT+ (violet) is an auxiliary relay output, used as a switch with a maximum rating of 250VAC, 5A or 30VDC, 5A for an outside power source.
12. Wire OUT- (gray) is the common for the output wire OUT+.

#### B. Modes

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

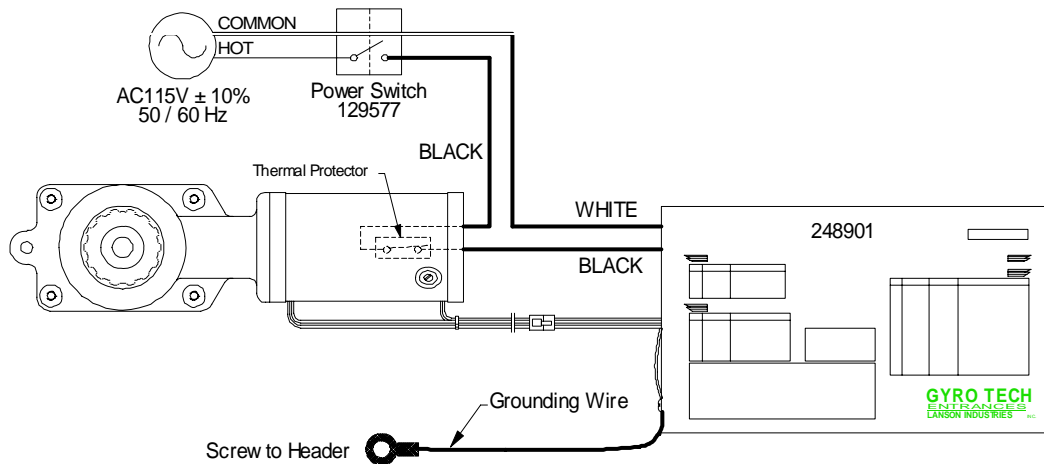
1. The door is in **auto mode** when both M0 and M1 are not connected to red wire #7. The approach and approach-through signals are available.
2. The door is in **hold-open mode** when M0 and M1 are on. No activation is needed when this selection is made.
3. The door is in **reduced-open mode** when green wire H is on. The door will have a reduced opening upon activation.
4. The door is in **one-way traffic mode** when M0 is on, but M1 is off. The approach and/or holding beams are available. The electric lock is locked from exterior entry.
5. The door is in **night traffic mode** when M0 is off, but M1 is on. Neither activation sensors and/or holding beams will active the door and will only provide threshold safety. The electric lock remains locked except for activations from wall plates or card readers.

C. Before turning on power

1. Make sure all components are wired and set properly. The unit must be grounded for safe and consistent operation (See Figure 2).

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

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



Wiring Diagram for Power & Grounding  
Figure 2

3. The controller will be damaged if the power is switched on and off too quickly. After switching off the power, wait a few seconds before switching it on again.
4. Long term exposure to temperatures colder than 10°Fahrenheit should be avoided. Store the unit at room temperature.
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 other than replacing the fuse.

### III. Normal Setup

**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. If the available sensor wiring features are not used, the pre-programmed parameters will operate the door.
- B. Start by placing the door at half open. Then plug the Handy Terminal into the corresponding Microprocessor connector.
- C. Turn on the power and note the direction of movement. The door should close slowly.
- D. If the door opens slowly, it has been set up with the wrong hand. Reverse the belt clips on the doors or in the case of a single slider, turn off the power and insert a handing harness (p/n 119208) between the Microprocessor and operator. Turn on the power. Note the direction of movement. The door should now close slowly.
- E. After the power is turned on, the Handy Terminal will act as a guide for set-up procedures and Microprocessor programming. As it is setting itself for the programming mode, it will display "Handy Terminal Gyrotech". It will be followed by a series of displayed messages and a list of acceptable options.

- F. 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.
1. When the message reads SLIDE/SWING/STRK, move the cursor to the Y position and press ENTRY.
  2. When the message reads SWING DOOR Y N, press ENTRY.
  3. When the message reads FULL OPEN POINT PUSH TEST, move the door to the full-open point and press TEST.

**NOTE: The door should be moving slowly from open to closed, measuring the stroke while it moves. Ensure there are no obstacles in the doorway which will cause incorrect measurement.**

4. When the unit has completed the initial setup, the message will read STD FUNCTION Y N. To see the door in action with the memorized settings, press TEST. The door will operate at the factory speeds and slow down at the latch check and back check points. After the test is completed, the display will again read “STD FUNCTION Y N”.

This concludes the initial setup to factory settings. A table has been provided on the next page showing the initial factory settings. The Handy Terminal can be disconnected per the following section and the building owner instructed on the doors operation. However, there are a multitude of options available for the door’s operation. Skip to Section V to learn about these options.

#### 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 10 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 disconnected, wait an additional 10 seconds to be sure all settings have been established.
- C. The door will now operate based on the pre-set settings shown in the following table. If changes are desired, proceed to Section V.

## List of Available Functions for the Setup of a Sliding Door

<b>Adjustable Function</b>	<b>Factory setting</b>	<b>Options</b>
<b>Standard Functions</b>		
Opening speed	5	Range 0 - 7
Closing time	3	Range 0 - 7
Time delay	2	Range 0 - 7
<b>Feeling Adjustments</b>		
Start power	3	Range 0 - 7
Check power	6	Range 0 - 7
Reaction power	4	Range 0 - 7
Back-check speed	1	Range 0 - 3
Latch-check speed	1	Range 0 - 3
<b>Special Functions</b>		
Hold close	Y	Yes or No
Holding beam	Y	Yes or No
Power on	0	Range 0 - 3
Manual opening	0	Range 0 - 3
Reduced opening	N	Yes or No
Recycle	Y	Yes or No
Recycle sensitivity	1	Range 0 - 3
After recycle	Y	Yes or No
Auxiliary output	0	Range 0 - 3
Output timer*	0	Range 0 - 3
Extended time delay	7	Range 0 - 7

\*The output timer selection is required only when selecting 0 or 2 on the auxiliary output.



## 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. Press entry to proceed to the next section or move the cursor to Y and press entry to start the Standard Functions program.
2. There are three categories of standard functions
  - ◆ **Opening Speed** - The message will read OPEN SPEED 5. Eight options are available from 0 to 7. Speeds range 2 inches per second (.05 meters per second) to 28 inches per second (.70 meters per second). Seven is the fastest, 0 is the slowest.

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

- ◆ **Closing Speed** - The message will read CLOSE SPEED 3. There are eight options with closing speeds the same as those under opening speed adjustment.
- ◆ **Time Delay** - The message TIME DELAY 2 will appear. This determines the number of seconds the door will stay open after both the activating and safety signals are cleared. Eight options are offered with time delays of 0 to 7 seconds. Longer time delays are possible through Special Function adjustments.

### B. Feeling Adjustments

1. The message FEELING ADJUST? Y N will appear. Press entry to proceed to the next section or move the cursor to Y and press entry to start the Feeling Adjustments program.
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 provides the slowest acceleration. Higher settings should be used on heavier doors or 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 abrupt braking.
  - ◆ **Reaction Power** - The message will read REACTION POWER 4. It controls how fast the door will react to an activating signal (i.e., how long it takes the closing door to reverse direction. Eight options are offered. Zero (0) provides the slowest reaction, 7 the fastest.

- ◆ **Back Check Speed** - The message will read BACK C. SPEED 1. This is the speed of the door just before the fully open position. Four speeds are offered. Zero (0) is the slowest setting at 1.6 inches per second (4 centimeters per second), and 3 is fastest at 4 inches per second (10 centimeters per second).
- ◆ **Latch Check Speed** - The message will read LATCH C. SPEED 1. This is the speed of the door just before the fully closed position. The same 4 speeds as back check are offered. Zero (0) is the slowest speed and 3 is the fastest.

### C. Special Function Adjustments

1. The message will read: SPECIAL FUNCTION Y N. Press entry to proceed to the next section or move the cursor to Y and press entry to start the Special Functions program.
2. There are 10 adjustments:
  - ◆ **Using Motor Power to hold the door closed.** The message will read HOLD CLOSE N. Option N leaves the door free at closed position. Selecting Y directs the microprocessor to hold the door closed with the motor on.
  - ◆ **Holding Beam** - The message will read HOLDING BEAM Y. Choose Y and the door opens, or choose N and door stays closed.
  - ◆ **Power On** - The message will read POWER ON 0. This option will determine what happens when the power is turned on after having been turned off or interrupted. A typical example would be if the owner unlocks the door and opens it manually before turning on power.
    - 1). Zero - The door slowly reaches full closed and is read for normal operations.
    - 2). One - If the door is activated while closing, the door will fully open and then close.
    - 3). Two - The door slowly reaches full open, then closes.
    - 4). Three - The door stays in manual-open position until activated, then opens and slowly closes.
  - ◆ **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:
    - 1). Zero - The door will remain in the same position it was manually opened to.
    - 2). One - When the door is opened manually, it will activate the power open.
    - 3). Two - After the door has been manually opened, it will slowly close.
    - 4). Three - The door will power close while trying to open manually.

- ◆ **Reduced opening** - The message will read RED. OPENING Y N. This will enable any reduced opening of the door. Select Y and press entry. Manually move the door to the desired open width and push TEST. The door will close slowly, memorizing the point of reduced width. Reduced opening will work when the Handy Terminal is disconnected and the reduced opening is selected.
- ◆ **Recycle** - The message will read RECYCLE? Y. Choose Y and when the door strikes an object, it will reopen. Choose N and door stops and stays in that position until an activation is received. After that activation, the door will return to the open position. Operation will then be governed by “After Recycle”.
- ◆ **Recycle Sensitivity** -The message will read: RECYCLE SENS. 1. It adjusts the sensitivity of force causing the door to recycle. Zero(0) is softest, 3 is hardest.
- ◆ **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 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 4 options:
  - 1). Zero - 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 four sub-options:

- (a). Zero - 1/4 second
- (b). One - 1/2 second
- (c). Two - 3/4 second
- (d). Three - 1 second (See note below)

**NOTE:** Option (d) is recommended for electric lock applications. This option will engage or disengage a jammed lock up to ten times before displaying an error message that will read: “Error\_4”. This error could be canceled by power reset.

- 2). One - 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.
- 3). Two - 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:

- (a). Zero - 2 seconds
- (b). One - 4 seconds
- (c). Two - 6 seconds
- (d). Three - 8 seconds

- 4). Three - When using the active at breakaway & recycle condition option, a signal will be active during the breakaway & recycle condition

**NOTE:** The common use of this function would be to notify another location of this condition.

- ◆ **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.
  - 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.
- ◆ **History Data** - The message will read: HISTORY DATA Y N?. Press entry to proceed to complete the programming or move the cursor to Y and press entry to review the History Data.
  - MAINTENANCE CNT: Indicates the number of times a handy terminal has been connected. It will record up to 255 connections.
  - OPERATION CNT: Indicates the number of full door operations. It is updated every 100 door cycles. The counter will display up to 6,502,500 cycles.
  - RECYCLE CNT: Indicates the number of times the door reversed direction after sensing an object was struck or the amount of friction surpassed the recycle sensitivity setting. It will display up to 255 recycles
  - RUNAWAY CNT: This is not addressed in the software of the sliding door program. It will remain at 0.

**A flow chart can be found at the back of the manual identifying the path to all of the functions and setting choices.**

## VI. Troubleshooting

- A. The door is recycling on its own.
  - 1. Forces significantly larger than five pounds used to move the door will cause it to recycle.
  - 2. During the opening cycle the door will stop. After losing the activating signal and time delay, the door will close. If the activation signal continues, the door remains open in stopped position.
  - 3. During the closing cycle, the door will operate in according to original installer setup.
  - 4. The Microprocessor will count every recycle through the use of the Handy Terminal. Operation should continue as soon as recycling is done.
  
- 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.
  - 3. When the power is turned on, the Microprocessor will operate. Settings to the door operation remain in effect.
  
- 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 door will not operate until the Handy Terminal clears the problem. When the Handy Terminal is connected, there will be one of these messages:
    - a. The message will read **STROKE ERROR**. This means the Microprocessor has sensed movement longer than the adjusted stroke. Check the timing belt and readjust the door stroke.
    - b. The message will read **RAM ERROR**. The Microprocessor needs replacing.
    - c. The message will read **EEPROM ERROR**. The unit can't read or write data. The Microprocessor needs to be replaced.

2. To clear the problem start by turning off the power and connect the Handy Terminal. Turn the power back on. A Handy Terminal message will be shown on the display. Set the cursor to Y and make the needed repairs.
3. If a second message occurs, clear the message and disconnect the Handy Terminal. Wait 10 seconds, and cut off the power source.
4. 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 open”.
2. If there is abnormal door operation, check or reset the stroke and install the handing harness where needed. Check the Handy Terminal settings.
3. If the display does not move from “Handy Terminal Gyrotech”, check the breakout circuitry and make sure it is closed loop. Install jumpers in all exposed blue wire connectors.

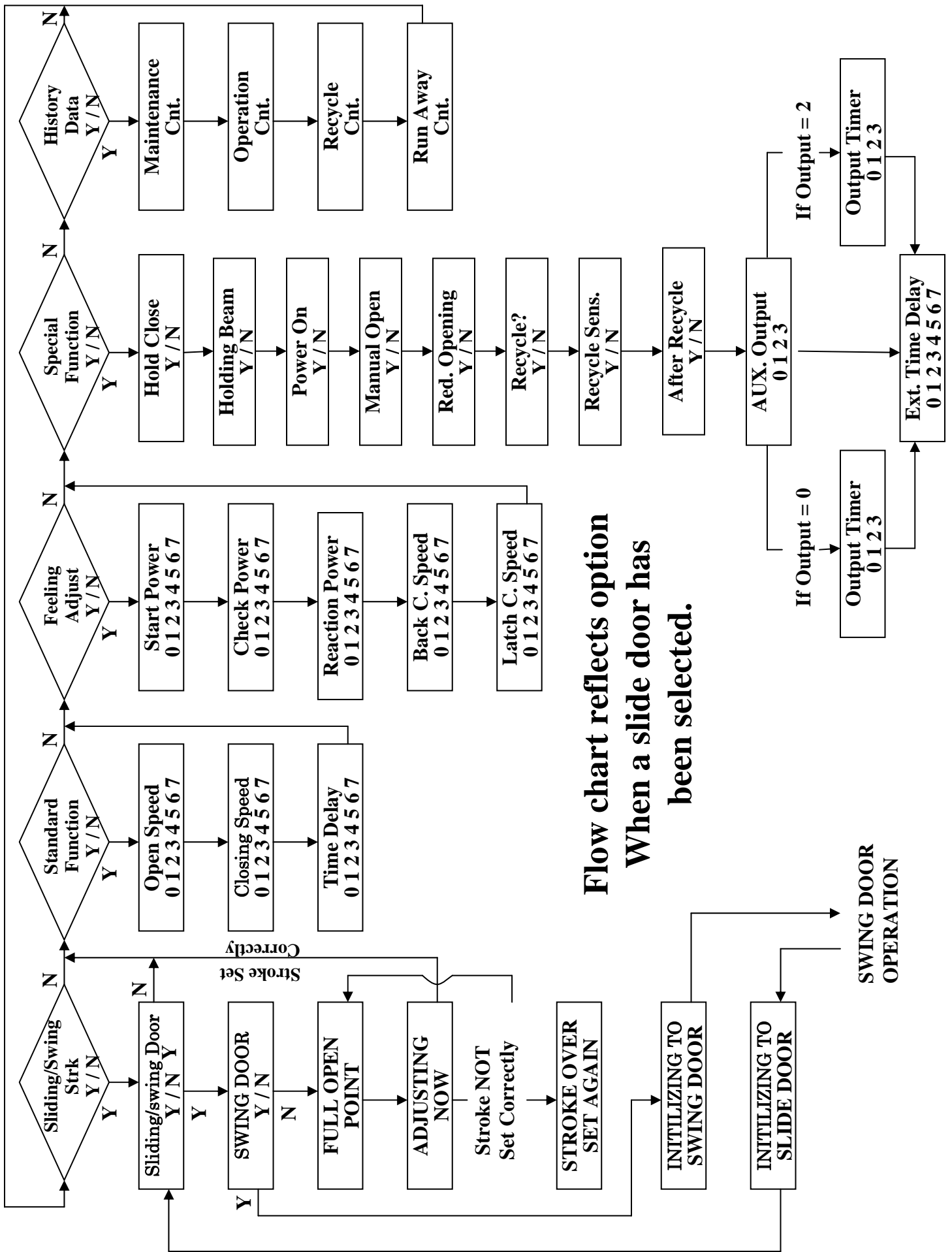
E. The Handy Terminal buttons do not work.

1. The unit has been exposed to too low of temperatures. Bring the unit up to room temperature.

**GYRO TECH HANDY TERMINAL ERROR CODES  
MICROPROCESSOR VERSION U19 & HIGHER**

NUMBER	ERROR MESSAGE	MEANING	RESOLUTION: MICROPROCESSOR MAY BE RESET BY PERFORMING ONE OF THE FOLLOWING PROCEDURES
1.	ROM ERROR	<u>Internal ROM Error</u>	Reset Microprocessor by turning 120 VAC off then on again OR connect Handy Terminal & and clear error message
2.	ERROR RESET AGAIN	<u>Communication Error</u> Communication between Microprocessor and Handy Terminal is not taking place.	Reset Microprocessor by turning 120 VAC off then on again. If problem persists the cables, or control and/or Handy Terminal might be defective. Tip: Try using Handy Terminal and/or harness on a different door.
3.	RAM ERROR	<u>Internal RAM Error</u>	Reset Microprocessor by turning 120 VAC off then on again OR connect Handy Terminal & clear error message
4.	EEPROM ERROR	<u>Internal EEPROM Error</u>	Reset Microprocessor by turning 120 VAC off then on again OR connect Handy Terminal & clear error message
5.	ERROR_4	<u>Electric Lock Error</u> Activation device was signaling the control to open door but the electric lock failed to unlock or bound up three times in a row.	Manually move the door to the latch position OR reset Microprocessor by turning 120 VAC off then on again OR connect Handy Terminal & clear error message
6.	ERROR_5	<u>Recycle Error</u> Recycle was detected more than three times at same door position continuously.	Allow door to creep to the full open or closed position OR reset Microprocessor by turning 120 VAC off then on again OR connect Handy Terminal & clear error message
A			
Above error codes might have been generated as the result of a hardware problem. If resetting the software as described above does not resolve the problem, the cause of the hardware malfunction must be determined and corrected.			

For additional assistance, contact NABCO Entrances, Inc. toll free at 1-877-622-2694



**Flow chart reflects option  
When a slide door has  
been selected.**