

TIP 22.14-2
i-MOTION™ II Service Tool Manual
February 18, 2002

REQUIRED READING:

☐ Field Operations Manager	☒ Modernization Supervisor
☒ Maintenance Supervisor	☒ Repair Supervisor
☐ Construction Superintendent	☒ Field Engineer

REVISION HISTORY:	Subject Matter	Date	Reason for Revision
	Expert		
	Corrie Archer	February 18, 2002	New TIP

SYSTEM:

☐ Low-Rise	☐ Mid-Rise	☐ High-Rise	☐ All Traction
☐ Escalator	☒ Other: Systems with i-MOTION™ II Door Operator		

COMPONENT/SUBSYS.: i-MOTION™ II Door Operator

SUBASS./PARTS: DCSS (Door Control Subsystem) Service Tool Interface with AAA30721AAA Baseline Software (not a lined up part)

SAFETY CONCERNS:

Potential Hazards:	Refer to Section:
☒ Fall	
☐ Crush	None
☒ Mechanical	
☒ Electrical	
☐ Chemical	None
☐ Other	None

PPE REQUIRED:

Equipment Category:	Specific Type of Equipment:
☒ Glasses/Face Shield	
☐ Ear Protection	None
☐ Gloves	None
☐ Harness/Coveralls	None
☒ Safety Shoes	
☐ Other	None

SUMMARY: This TIP serves as an i-MOTION™ II Service Tool Manual.

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WARNING: When the emergency stop switch on the i-MOTION™ II controller is pushed, the safety circuit opens and the door operator will no longer respond to external commands. This switch does not remove power from the door operator. The service tool or three-button interface can initiate door operator motion.

Service Tool Operations

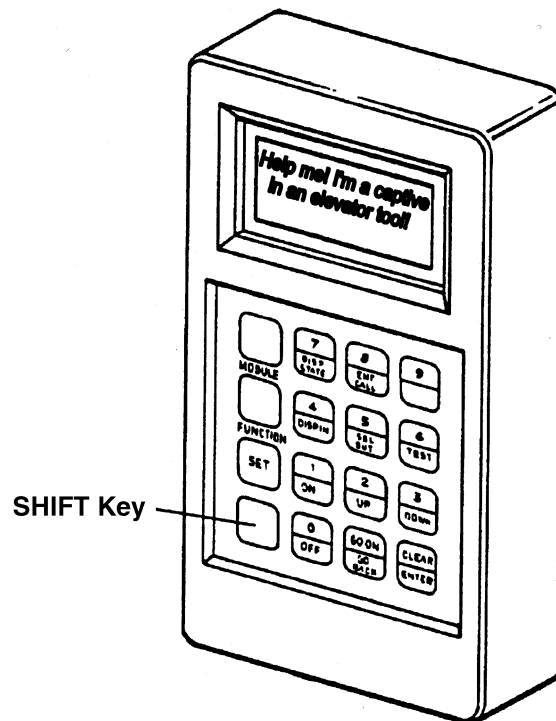


Figure 1: Service Tool

Keypad Description

The Service Tool (p/n MT-122059) front panel consists of a display and 16 keys. The display is a two-line, 16-character per line, liquid crystal display.

Twelve of the keys are divided into two parts. The upper part of the key is white, while the lower part of the key is blue. To activate the blue function on any key, press SHIFT (the unmarked blue button on the lower left of the keypad), then press the key. For example, if the GO ON/GO BACK key is pressed, the GO ON function occurs. If the SHIFT key, then the GO ON/GO BACK key is pressed, the GO BACK function occurs.

NOTE: When the SHIFT key has been pressed, a cursor will blink in the first character of the display.

Table 1: Keypad Map

Key(S)	Function
0	Zero
SHIFT + 0	OFF
1	One
SHIFT + 1	ON
2	Two
SHIFT + 2	Indicates Up direction of motion
3	Three
SHIFT + 3	Indicates Down direction of motion
4	Four
SHIFT + 4	Hexadecimal number A (decimal 10)
5	Five
SHIFT + 5	Hexadecimal number B (decimal 11) or Clear Fault Log, SEL OUT
6	Six
SHIFT + 6	Hexadecimal number C (decimal 12)
7	Seven
SHIFT + 7	Hexadecimal number D (decimal 13), DISP STATE
8	Eight
SHIFT + 8	Hexadecimal Number E (decimal 14), ENT CALL
9	Nine
SHIFT + 9	Hexadecimal number F (decimal 15), TEST
CLEAR	Erases the last digit entered
SHIFT + CLEAR	Enters the value on the screen into the microprocessor's memory
SET	Returns to the third level menu
FUNCTION	Returns to the second level menu
MODULE	Returns to the top level menu
GO ON (>)	Scrolls forward through displays
SHIFT+GO ON (<)	Scrolls backward through displays

Connecting the Service Tool

The service tool may be connected directly to the i-MOTION™ II controller or indirectly via the OCSS or MCSS board. Some Service Tool functions, such as issuing run commands, can only be performed with the Service Tool connected directly to the i-MOTION™ II controller

The service tool will execute a Self Test. If the test completes successfully, the Service Tool display should read:

SELF TEST
-OK- MECS-MODE

Press the Module key to proceed to the Service Tool Menu.

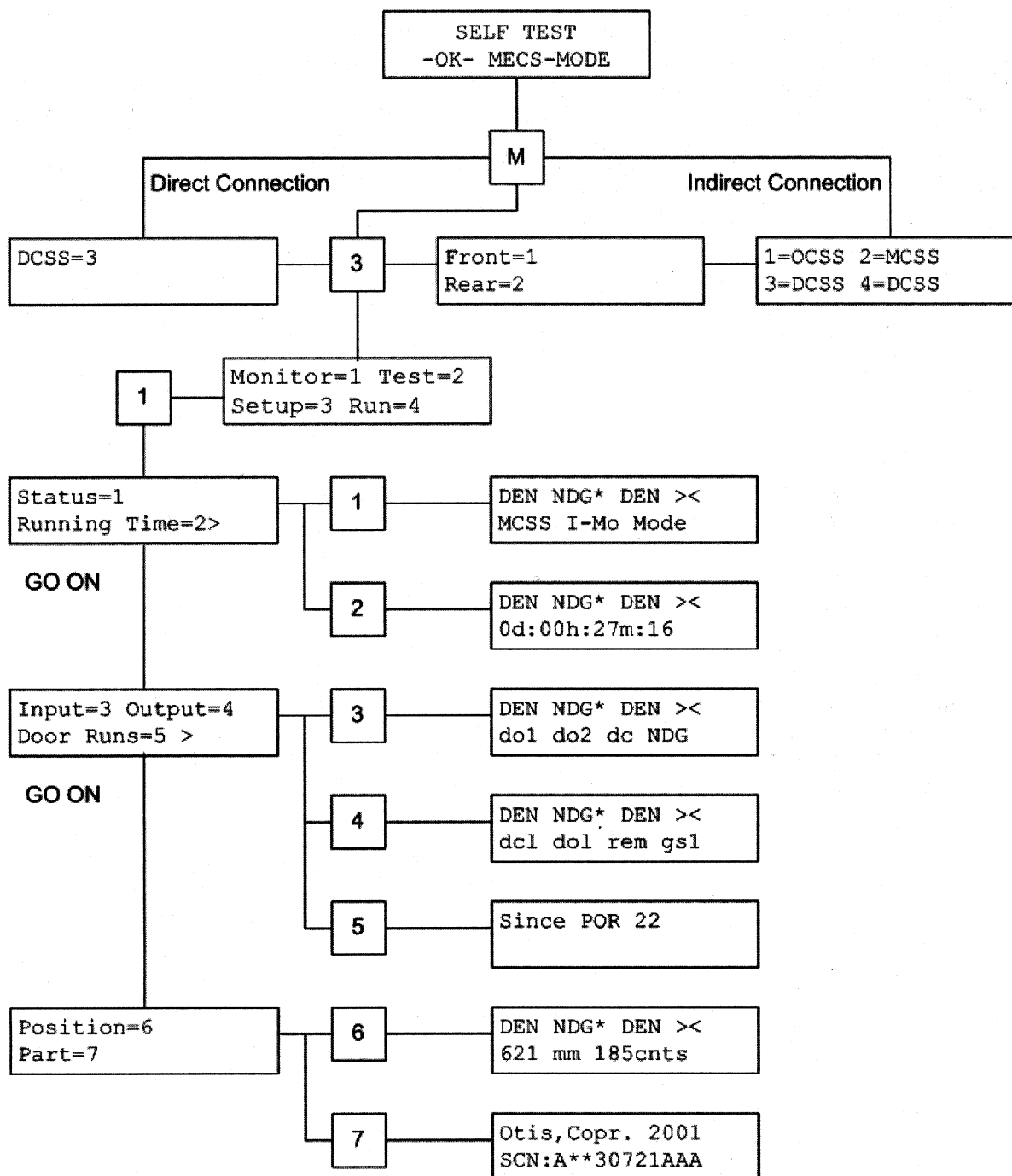
If the display reads:

SELF TEST
-OK-MP2/3-MODE

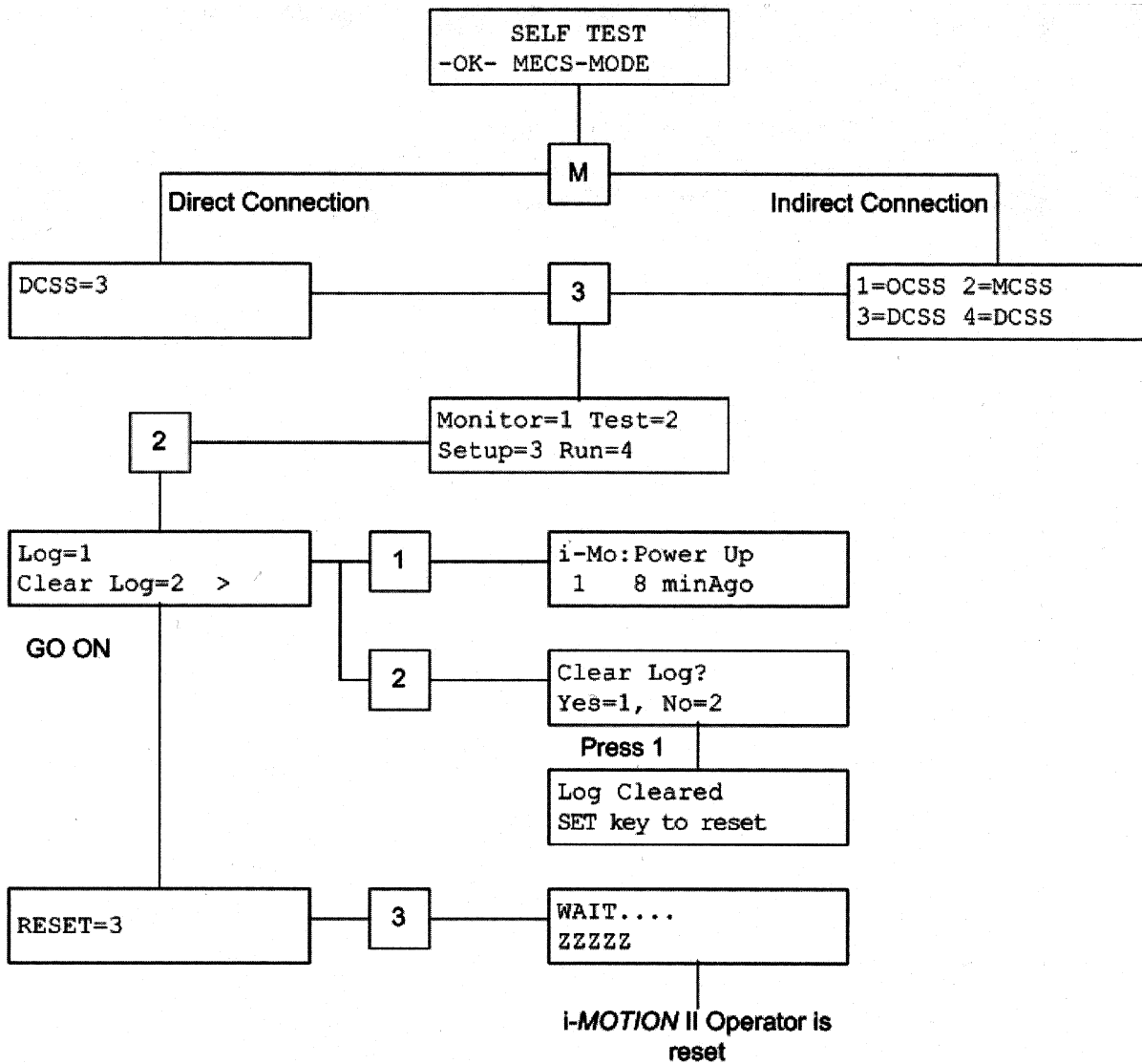
Verify that the service tool is plugged into the port well. Disconnect, then reconnect the service tool. If this display reappears, there is a failure of the small cable to the board, the service tool, i-MOTION™ II Control Board, MCSS or OCSS board. Try plugging the service tool into another MCSS or RCB to retest the service tool.

With a direct connection of the service tool to the i-MOTION™ II if power is recycled, the service tool will have to be reset. This is normally done by unplugging the service tool and plugging it back into the port.

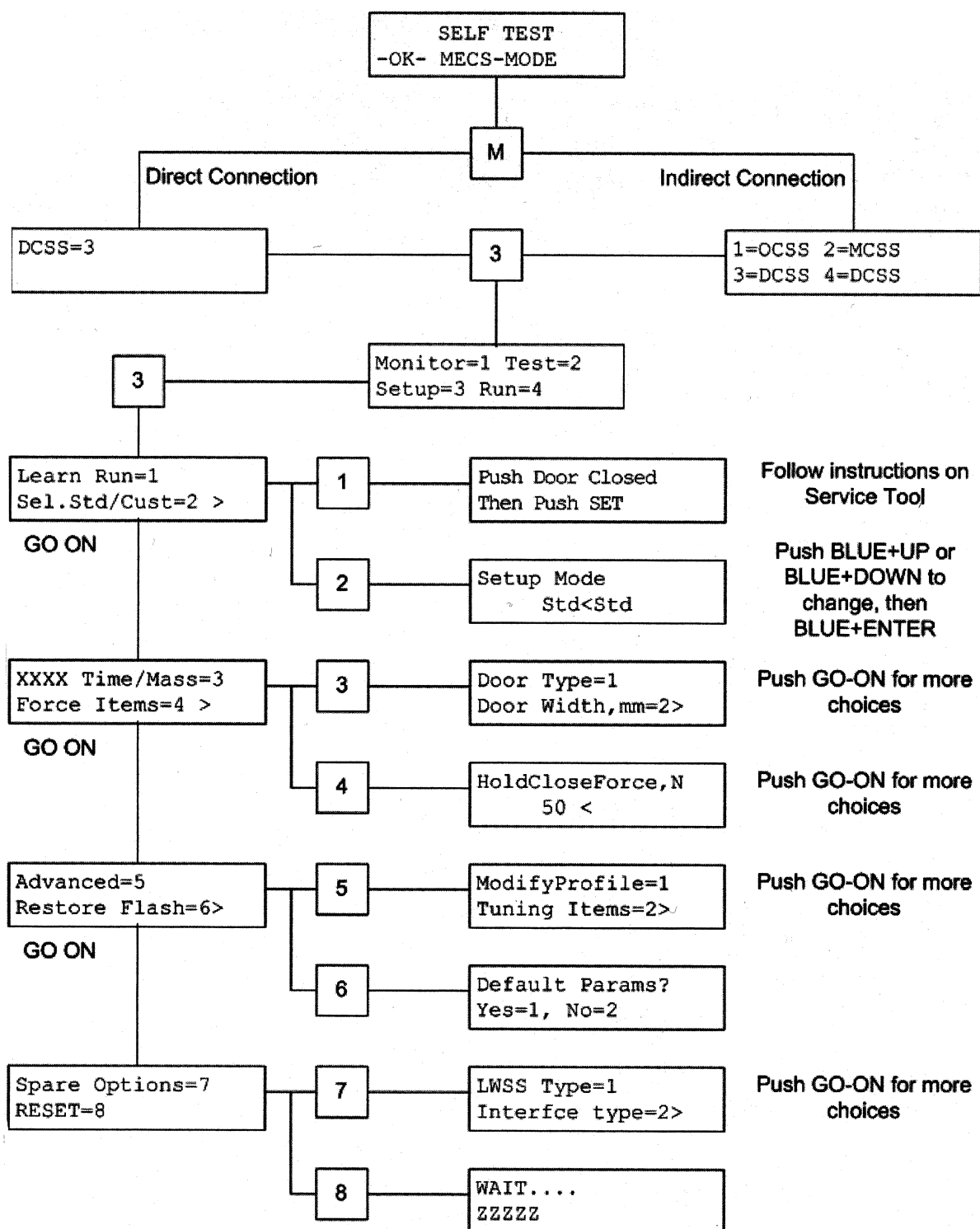
Monitor Menu Flowchart



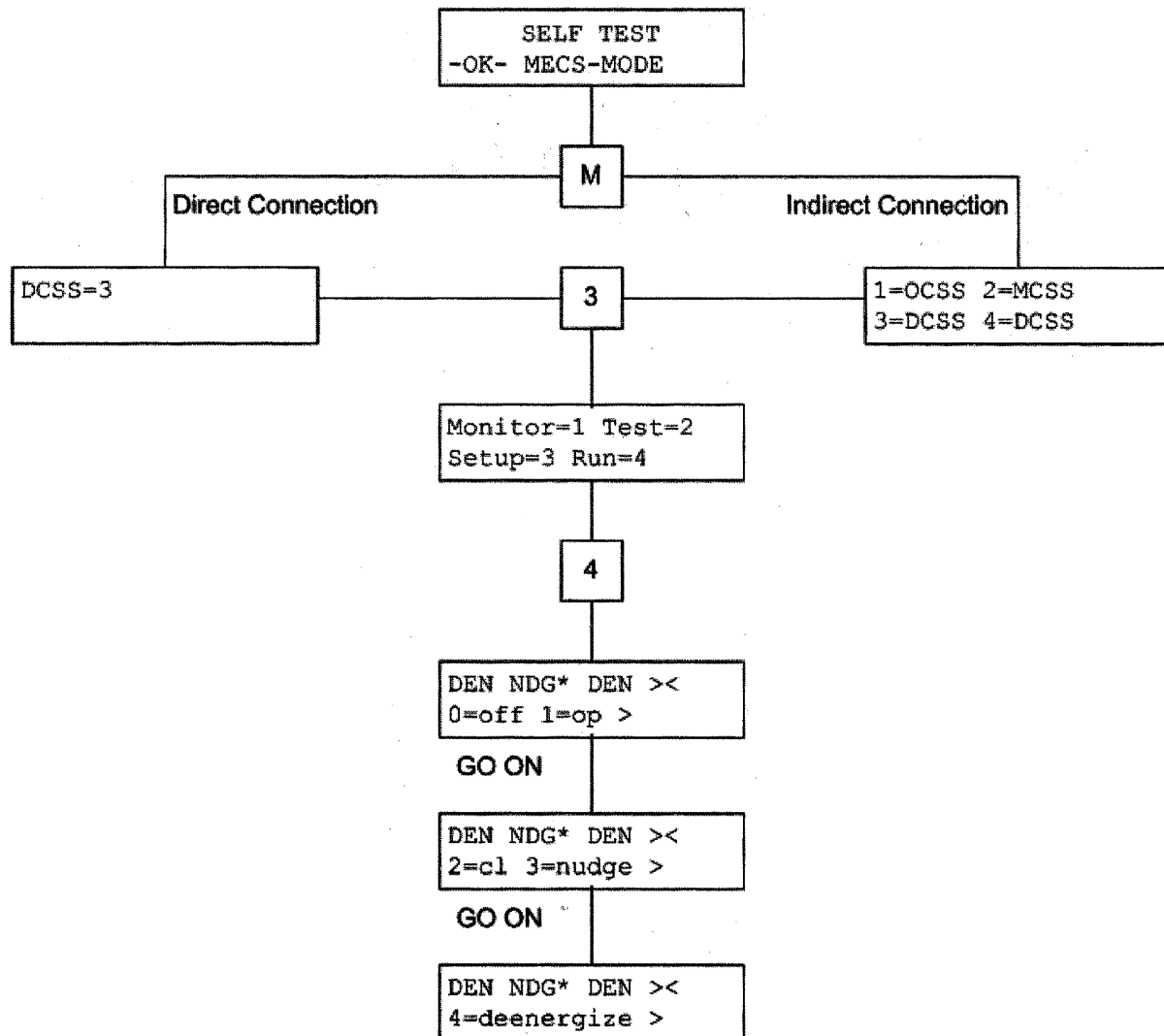
Test Menu Flowchart



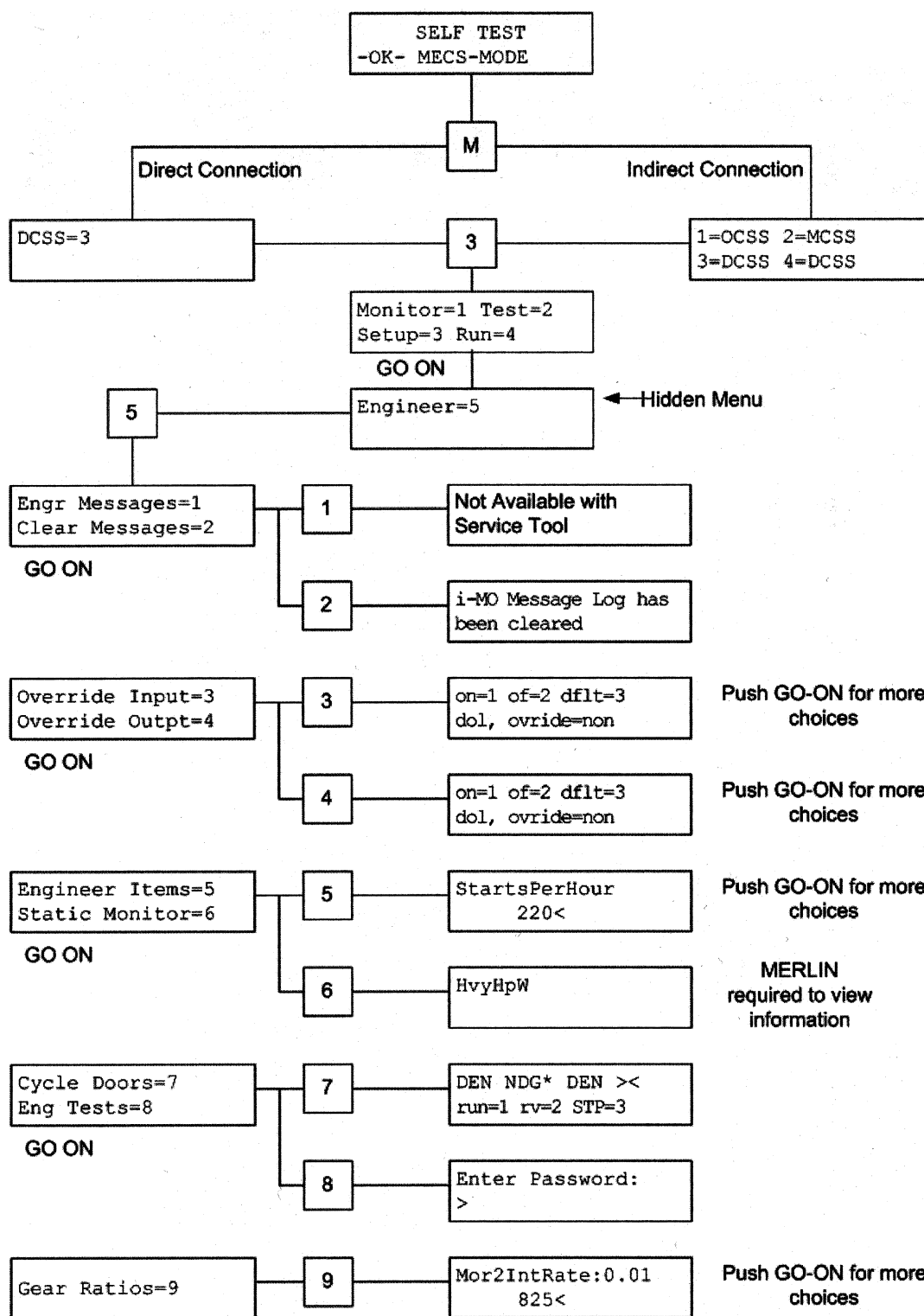
Setup Menu Flowchart



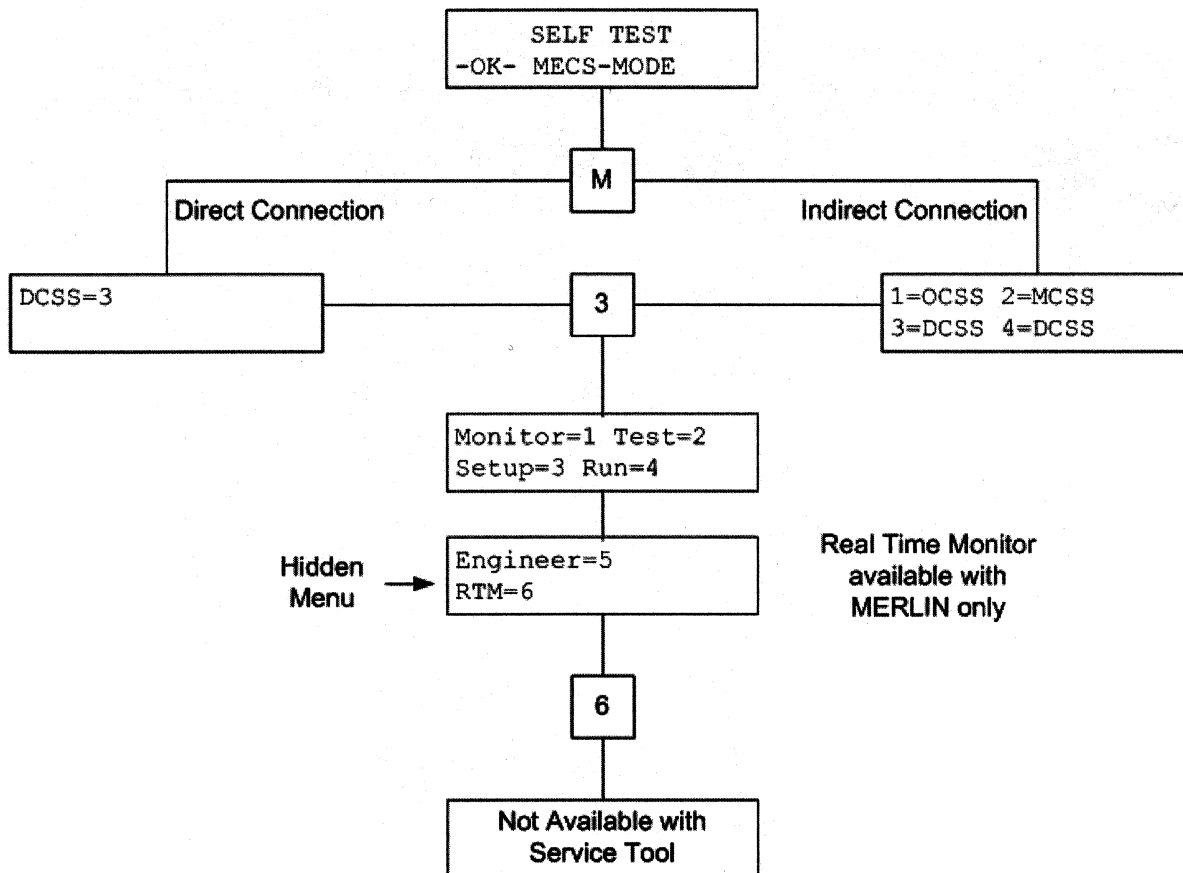
Run Menu Flowchart



Engineer Menu Flowchart



Real Time Monitor Menu



i-MOTION™ II Baseline software FLASH PROM

Chip	Location	Otis p/n	Blank Device p/n
Intel PA28F200	U4 on Control Bd.	AAA30721AAA	AAA616QK2

On all newer i-MOTION™ II boards, the U4 is soldered directly to the board. Some early versions used a chip socket for U4.

The i-MOTION™ II should be used with the following minimum software levels in other subsystems:

AAA30005AAJ-CN1	OCSS software
AAA30045AAI	MCSS software
AAA30085AAG	LMCSS software
AAA30396AAB	MLB III software

Monitor Status

M-3-1-1

M Module
3 DCSS
1 Monitor
1 Status

The first line of the status display is the first line of most monitor displays. On this screen, the information in the second row labels the first row fields, except for the door state field.

mmm hhhh ddd ss MCSS I-Mo Mode
--

mmm Door command from (L)MCSS
hhhh Internal i-MOTION™ door command
ddd i-MOTION™ II mode
ss Door state

Table 2: (L)MCSS Door Commands

(L)MCSS Door Command	Function	DOB/SGS Reversal	LRD Reversal	EDP Reversal
DEN	Deenergize	---	---	---
OP1	Open profile 1	---	---	---
OP2	Open profile 2	---	---	---
CL1	Close door 1	None	None	None
CL2	Close door 2 (normal)	Full	Full	Full
CL3	Close door 3	Full	Full	Limited
CL4	Close door 4	Full	Limited	Limited
CL5 (NDG)	Close door 5 (nudge)	Full	None	None
CL6	Close door 6	Full	None	Limited
CL7	Close door 7	Limited	None	Limited
CL8	Close door 8	Limited	None	None

full	=	Full Reversal
limited	=	Limited Reversal (doors open as long as reversal device or DOB are active)
none	=	No Reversal
DOB/SGS	=	Door Open Button/Safety Shoe
LRD	=	Light Ray Device
EDP	=	Electronic Door Protection (LAMBDA [®] Detector)

NOTE: (L)MCSS direct command (M-2-1-1) "CL0" = DCSS M-3-1-1 "CL1,"
(L)MCSS direct command (M-2-1-1) "CL1" = DCSS M-3-1-1 "CL2," etc.

hhhh = Internal i-MOTION™ II Door Commands:

OP1	=	Open Profile 1
OP2	=	Open Profile 2
CL	=	Close
NDG	=	Nudge
DEN	=	De-energize
RvL	=	Limited Reversal
RvF	=	Full Reversal

An asterisk (*) in this column after the internal i-MOTION™ II command indicates one of the following two conditions:

1. The i-MOTION™ II is under the control of the service tool through the M-3-4 RUN option. (L)MCSS commands are ignored while in this mode.
2. The communication type is multi-drop and the i-MOTION™ II is not receiving communications from (L)MCSS.

Example: Suppose the (L)MCSS command is a CL2. If there is an active reversal, then the i-MOTION™ II command will be an RvF and not CL.

ddd = **i-MOTION™ II mode:**

DEG	=	Degraded Performance (slower open time [see LimitRevTime, ms in M-3-3-2] due to temperature rise, normal close)
DEN	=	Deenergize (power removed from motors)
INI	=	Initialize (slow open and close)
INS	=	Inspection Operation
LRN	=	Learn Run
NRM	=	Normal
SHD	=	Shut Down (reset required)
STL	=	Stall

ss = **door state:**

[]	=	fully open
<>	=	opening
><	=	closing
] [	=	fully closed

Door state will not show fully closed while the i-MOTION™ II mode is DEN or SHD.

Monitor Running Time

M-3-1-2

- M Module
 - 3 DCSS
 - 1 Monitor
 - 2 Running Time
-

This screen shows the current running time of the system since the last reset (POR).

NOTE: The status display is always on the first line.

CL1 CL NRM] [
1d:11h:21m:30

This display indicates that one day, eleven hours, twenty-one minutes and thirty seconds has elapsed since the last POR.

Monitor Inputs

M-3-1-3

M Module
3 DCSS
1 Monitor
3 Inputs

This screen shows the state of the discrete inputs. If the signal is ON or active, it is capitalized. If the signal is off or inactive, it is in lower case letters. The signals shown in these screens will vary according to the EEPROM communication type parameter, CommType.

NOTE: The status display is on the first line. Below are the normal signal states with the car at a landing with the doors closed.

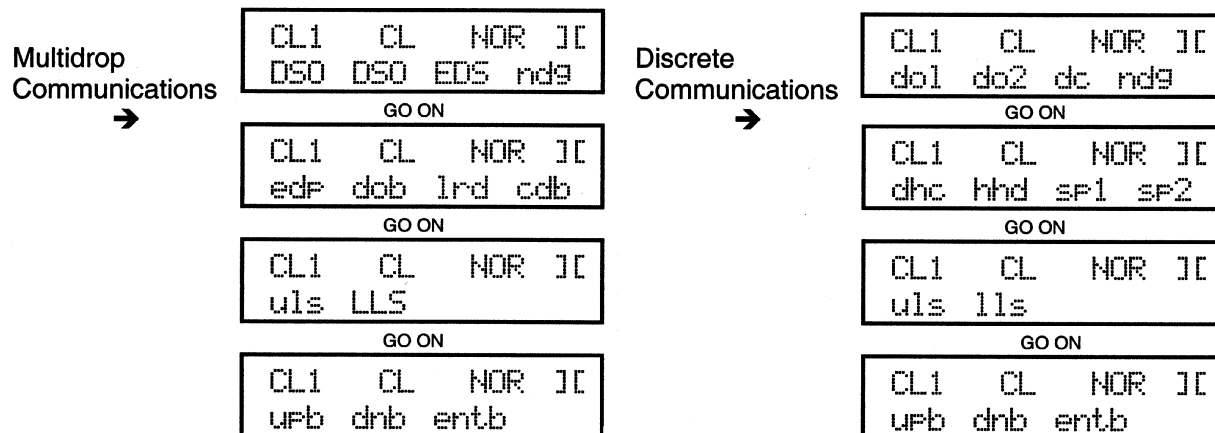


Table 3

SVT	Name	Description (Active State)
Discrete Wiring	DO1	[Discrete]: Door Open Signal (30 V RTN on P6-3)
	DO2	[Discrete]: Door Open Signal (30 V RTN on P6-3)
	DC	[Discrete]: Door Close Signal (30 V RTN on P6-4).
	NDG	[Discrete]: Nudge Signal (30 V RTN on P6-5)
	DHC	[Discrete]: Door Hold Close Signal (30 V RTN on P6-6).
	HHD	[Discrete]: Heavy Hall Door Input
	SP1	[Discrete]:
	SP2	[Discrete]:
Multidrop Wiring	DSO	[Multidrop]: Door Safe To Open—HL3 to P6-3 When Active
	DSO	[Multidrop]: Door Safe To Open—HL3 to P6-3 When Active
	EDS	[Multidrop]: Emergency Door Stop Input
	EDP	[Multidrop]: Lambda Detector Input
	DOB	[Multidrop]: Door Open Button
	LRD	[Multidrop]: Light Ray Device
	CDB	[Multidrop]: Car Door Bypass Operation Input
All	ULS	[Discrete & Multidrop]: Door Operator Limit Sensor
	LLS	[Discrete & Multidrop]: Door Operator Limit Sensor
	UPB	[Discrete & Multidrop]: Up Button (on 3-button interface)
	DNB	[Discrete & Multidrop]: Down Button (on 3-button interface)
	ENTB	[Discrete & Multidrop]: Enter Button (on 3-button interface)

Monitor Outputs

M-3-1-4

M Module
3 DCSS
1 Monitor
4 Output

This screen shows the state of the discrete outputs (on active—CAPS; off inactive—lower case).

NOTE: The status display is always on the first line.

CL1	CL	NOR	][
DCL	dol	rem	gs1

CL1	CL	NOR	][
Shtdwn	ospr2		

Table 4

SVT Name	Description (Active State)
DCL	Door Close Limit - Appropriate limit sensor (ULS or LLS) is active and the position is less than TolerClosdGap,mm .
DOL	Door Open Limit - Appropriate limit sensor (ULS or LLS) is active and the door position is within ToleranceOpen,mm of the DoorWidth parameter position.
GS1	Gate Switch Monitor 1 - Active when the doors are closed within the "Gs1 Gap Width" parameter gap width. Allows advanced brake lift.
REM	Rem Door Opening - output signal to REM that doors are opening.
SHTDWN	i-MOTION™ II has shut down due to a fault. One last open command is allowed.
OSPR2	Spare - used for production testing

Monitor Door Runs**M-3-1-5**

M Module
3 DCSS
1 Monitor
5 Door Runs

This tool sequence indicates the number of door operations since the operator was last POR'd. The counters increment continually while the elevator is making runs. A door run is defined as a full open and a full close. The counter is incremented when the doors reach the closed position. The count will be reset on power recycle or i-MOTION™ II controller reset.

SincePOR 1015

GO ON

```
** List End **  
SET if done
```

In the example above, there are 1015 door runs in the life of the i-MOTION™ II door system since the last POR.

Monitor Position

M-3-1-6

M Module
3 DCSS
1 Monitor
6 Position

This is a dynamic display of the car door position. The measurements are from the fully closed position.

NOTE: The status display is always on the first line.

CL1	CL	NOR	][
_____mm		_____cnts	

If the door is fully closed, then 0 mm should be displayed for the position.

Monitor Part Number**M-3-1-7**

M Module
3 DCSS
1 Monitor
7 Part

This display shows the current version and date of the i-MOTION™ II baseline software.

Example:

Otis, Corp. 2001
SCN: AAA30721AAA

Test Log

M-3-2-1

M Module
3 DCSS
2 Test
1 Log

The log is used to display system events, which include faults, warnings, and informational messages about system operation. See the i-MOTION™ II faults at the end of this document for a description of the faults, warnings, and informational messages.

General format:

ddddddddddddddddd nnn xxxxx minAgo

dd = event description
nnn = number of times the event has occurred
xxxxx = minutes since this event occurred last
minAgo = short for “minutes ago”

Press the GO ON key to sequence through the events. If no events have occurred, the screen indicates “No Events Logged.”

If the message RESET appears after an event name, it means a reset or POR has occurred since the event was logged. Various false events may register when the i-MOTION™ II power is recycled. Care should be taken to determine the validity of events that indicate “before RESET.”

Events are stored permanently, unless cleared by pressing SEL OUT to clear ALL events, or M-3-2-2.

Example of an informational message:

<pre>i-Mo: Power Up 15 1184 minAgo</pre>
--

In the example, the i-MOTION™ II system has powered up 15 times. The last time was 1184 minutes ago.

Test Clear Log

M-3-2-2

- M Module
 - 3 DCSS
 - 2 Test
 - 2 Clear Log
-

After selecting this option, the service tool indicates:

Clear Log?
Yes=1, No=2

Press 1

Log cleared
Press SET key

Press the SET key to return to the menu options screen.

Test Reset**M-3-2-3**

M Module
3 DCSS
2 Test
3 Reset

Selecting this option will reset the i-MOTION™ II controller. The service tool will display:

WAIT...
ZZZZZ

GO ON

DCSS = 3

It is best to perform this sequence while the doors are not in motion.

Press 3 to continue to menu selections.

Setup Learn Run

M-3-3-1

- M Module
 - 3 DCSS
 - 3 Setup
 - 3 Learn Run
-

Learn Run Notes:

- If the Learn Run is aborted, not all of the initial information before the Learn Run was started is retained. If the Learn Run is aborted, do not reset the I-MOTION™ II controller until a successful Learn Run is accomplished.
- During the initial adjustment, the operator must complete one successful Learn Run before the doors can run normally. If the doors are commanded to run and a Learn Run has not been completed, an event is logged Wrn:MustLrnToRun.
- It is recommended to perform a new Learn Run when the baseline software is upgraded or a new i-MOTION™ II processor board has been installed, and when a change has been made to the encoder or direction limit sensors.

Place the car on In-Car Inspection. It is recommended to have the car level with a floor if the "DoorWidth" parameter is to be adjusted precisely (hoistway doors flush with returns).

Learn Run

NOTE: Push the i-MOTION™ II door operator ESTOP switch before performing a Learn Run.

Step 1–Close Doors

To begin a Learn Run, the doors must be closed. Close the doors by hand.

Push	Door	Closed
Then	Press	SET

Press SET to continue to the next screen.

Step 2–E-Stop Warning

An e-stop ignored warning screen will appear.

WRN!!	E-Shop	Ig-
nored!	Press	SET

Press SET to continue to the next screen.

Step 3–Learn Closed Position

Learning
Closed Position

Up=Opn	DOWN=Cls
SET	when done

Press SET to continue to the next screen.

Step 4–Tune Open

NOTE: Use the BLUE+UP or BLUE+DOWN keys on the Service Tool to finetune the fully open and closed positions.

Tune Open

Closing Doors

Wait

Still Learning
SET key to cont.

Press SET to continue to the next screen.

Step 5–Re-initialize Doors

Re-Initializing

Opening Doors

Closing Doors

LrnRun complete.
Press SET 2 save

Press SET to save learn run and continue to the next screen.

WAIT...

WARNING: Before proceeding, clear everything from the path of the doors, hangers, couplers, etc. If the car is away from the landing, temporarily prop up the restrictor angle. Be certain the car door open stops are in place, approximately 3 mm out from the desired fully open door position. The operator will first push the doors fully closed, open the doors until they stall against the stop bolts, then fully close the doors again.

When ready, press 1 to start door motion. Press any key to abort the Learn Run. See Note 1 at the beginning of this section if the Learn Run is aborted. There will be several messages as the Learn Run progresses, i.e., Closing doors, Open To Hard Stop, and Almost done.... These messages indicate normal Learn Run operation.

Step 6—Learn Run Complete

Learn Success
Press SET key

When message is displayed, a successful Learn Run has been completed. Press SET to continue.

NOTE: If there is a position system fault, the Learn Run is aborted and the following message is displayed. Check the log and troubleshoot accordingly. The Setup menu is displayed after SET is pressed.

Aborted, see log
Press SET key

If the doors are stalled (blocked), the Learn Run is aborted and the following message is displayed. The Setup menu is displayed after ENTER is pressed.

Doors stalled
Press SET key

It may be necessary to increase the Stall Force parameter, M-3-3-4, to complete a Learn Run. This may, however, be an indication that there are unnecessary frictional forces present. Also, if the EDS (Emergency Door Stop) input is not active, a stall will occur, interrupting a Learn Run. Refer to the Fault description appendix.

Setup Sel. Std/Cust

M-3-3-2

M Module
3 DCSS
3 Setup
2 Sel. Std/Cust

Select standard or custom door configuration.

Setup mode
Std < Std

Press BLUE-2 (UP) or BLUE-3 (DOWN) to select between standard (Std) and custom (Cust).

Press BLUE-ENTER to change the door setup.

When Custom mode is selected, different menus will become available. All measurements in Custom mode are Metric.

Check the top of the page to see if the menu shown is for Standard Mode or Custom Mode.

Most new equipment jobs should be set for Standard Mode.

NOTE: In order for any new settings to take effect, the i-MOTION™ II board must be reset using the service tool (M-3-3-8), (M-3-2-3), or three-button interface.

Setup Standard Time/Mass

M-3-3-3

- M Module
- 3 DCSS
- 3 Setup
- 3 Std. Time/Mass

Press GO ON to reveal further menu choices.

Door Type=1
Door Opening=2

GO ON

Door Width=3
Cab Height=4

GO ON

Entrance Hgt=5
CarDoorFinish=6

GO ON

HallDoorFinish=7
HvyDoorfinish=8

Setup - Standard Time/Mass - Door Type

M-3-3-3-1

- M Module
- 3 DCSS
- 3 Setup
- 3 Std. Time/Mass
- 1 Door Type

The car door type can be directly entered.

Door Type
c o < c o

Press BLUE-UP or BLUE-DOWN to select door type.

Press BLUE-ENTER to change the door type

The door types available are shown in Table 5.

Table 5: Door Types

Door Type	Description
co	Right Center-Opening
ssLeft	Single-Speed Left Opening
ssRight	Single-Speed Right Opening
2sLeft	2-Speed Left Opening
2sRight	2-Speed Right Opening
coHC	Right Center-Opening, High Cab (MOD only)
Lco	Left Center-Opening (MOD Only)
LcoHC	Left Center-Opening, High Cab (MOD only)

Setup - Standard Time/Mass - Door Width**M-3-3-3-2**

- M** Module
- 3** DCSS
- 3** Setup
- 3** Std. Time/Mass
- 2** Door Opening

Select door opening (front or alternate).

Opening
Front < Front

Press BLUE-UP or BLUE-DOWN to select door type.

Press BLUE-ENTER to change the door width.

The door openings available are shown Table 6.

Table 6: Door Openings

Door Type	Description
Front	Front Opening
Alt	Alternate Opening
UpFront	Front Opening of Upper Deck of Double-Deck Elevator
UpAlt	Alternate Opening of Upper Deck of Double-Deck Elevator

Setup - Standard Time/Mass - Door Width

M-3-3-3-3

- M Module
- 3 DCSS
- 3 Setup
- 3 Std. Time/Mass
- 3 Door Width

Select standard door width (inches).

Door Width
42 in < 42 in

Press BLUE-UP or BLUE-DOWN to select door type.

Press BLUE-ENTER to change the door width.

The door widths available are shown in Table 7.

Table 7: Door Widths

Door Type	Door Widths
Right Center-Opening (co)	42, 48 in.
Left Center-Opening (Lco)(MOD only)	42, 48 in.
Single-Speed Right Hand (ssright)	32, 36, 42 in.
Single-Speed Left Hand (ssleft)	32, 36, 42 in.
2-Speed Right Hand (2sright)	42, 48, 54 in.
2-Speed Left Hand (2sleft)	42, 48, 54 in.
Right Center-Opening, High Cab (coHC)(MOD only)	42, 48 in.
Left Center-Opening, High Cab (LcoHC)(MOD only)	42, 48 in.

Setup - Standard Time/Mass - Cab Height**M-3-3-3-4**

- M** Module
 - 3** DCSS
 - 3** Setup
 - 3** Std. Time/Mass
 - 4** Cab Height
-

Select standard cab height (ft./in.).

Cab Height 8 ft, 0 in < 8 ft, 0 in

Press BLUE-UP or BLUE-DOWN to select door type.

Press BLUE-ENTER to change the cab height.

The cab heights available are shown in Table 8.

Table 8: Cab Heights

Cab Heights
8 ft., 0 in.
9 ft., 7 in.

Setup - Standard Time/Mass - Entrance Height

M-3-3-3-5

- M Module
 - 3 DCSS
 - 3 Setup
 - 3 Std. Time/Mass
 - 5 Entrance Height
-

Select standard entrance height (ft.).

Entrance Height 7 ft < 7 ft

Press BLUE-UP or BLUE-DOWN to select door type.

Press BLUE-ENTER to change the entrance height.

The entrance heights available are shown in Table 9.

Table 9: Entrance Heights

Entrance Heights
7 ft
8 ft

NOTE: 9 ft. 7 in. cab height required for 8 ft. entrance.

Setup - Standard Time/Mass - Car Door Finish

M-3-3-3-6

- M** Module
- 3** DCSS
- 3** Setup
- 3** Std. Time/Mass
- 6** Car Door Finish

Select standard car door finish.

CarDoorFinish
PntdStl < PntdStl

Press BLUE-UP or BLUE-DOWN to select door type.

Press BLUE-ENTER to change the car door finish.

The car door finishes available are shown in Table 10.

Table 10: Available Car Door Finishes

Car Door Finish	Description
PntdStl	Painted Steel
Stnless	Stainless
Bronze	Bronze
Kick Pl	Kick Plate

Setup - Standard Time/Mass - Hall Door Finish

M-3-3-3-7

- M Module
 - 3 DCSS
 - 3 Setup
 - 3 Std. Time/Mass
 - 7 Hall Door Finish
-

Select standard hall door finish.

HallDoorFinish
PntdStl < PntdStl

Press BLUE-UP or BLUE-DOWN to select door type.

Press BLUE-ENTER to change the hall door finish.

The hall door finishes available are shown in Table 11.

Table 11: Hall Door Finishes

Hall Door Finish	Description
PntdStl	Painted Steel
Stnless	Stainless
Bronze	Bronze

Setup - Standard Time/Mass - Heavy Hall Door Finish

M-3-3-3-8

- M** Module
- 3** DCSS
- 3** Setup
- 3** Std. Time/Mass
- 8** HVYHDoor Finish

Select standard hall door finish.

HallDoorFinish
PntdStl < PntdStl

Press BLUE-UP or BLUE-DOWN to select door type.

Press BLUE-ENTER to change the heavy hall door finish.

The heavy hall door finishes available are shown in Table 12.

Table 12: Heavy Hall Door Finishes

Hall Door Finish	Description
PntdStl	Painted Steel
Bronze	Bronze
Stnless	Stainless

Setup - Custom Time/Mass

M-3-3-3

M Module
3 DCSS
3 Setup
3 Cust Time/Mass

Press GO ON to reveal further menu choices.

Door Type=1
Door Opening=2 >

GO ON

Door Width, mm=3
Door Time=4

GO ON

Door Weights=5

Setup - Custom Time/Mass - Door Type**M-3-3-3-1**

- M** Module
- 3** DCSS
- 3** Setup
- 3** Cust Time/Mass
- 1** Door Type

The car door type can be directly entered.

Door	Type
c o <	c o

Press UP (BLUE-2) or DOWN (BLUE-3) to select door type.

Press BLUE-ENTER to change the door type

The door types available are shown in Table 13.

Table 13: Door Types

Door Type	Description
co	Right Center-Opening
Lco	Left Center-Opening (MOD Only)
ssLeft	Single-Speed Left Opening
ssRight	Single-Speed Right Opening
2sLeft	2-Speed Left Opening
2sRight	2-Speed Right Opening
coHC	Right Center-Opening, High Cab (MOD only)
LcoHC	Left Center-Opening, High Cab (MOD only)

Setup - Custom Time/Mass - Door Opening

M-3-3-3-2

- M Module
 - 3 DCSS
 - 3 Setup
 - 3 Cust Time/Mass
 - 2 Door Opening
-

Select door opening (front or alternate).

Opening
Front < Front

Press BLUE-UP or BLUE-DOWN to select door type.

Press BLUE-ENTER to change the door width.

The door openings available are shown in Table 14.

Table 14: Door Openings

Door Type	Description
Front	Front Opening
Alt	Alternate Opening
UpFront	Front Opening of Upper Deck of Double-Deck Elevator
UpAlt	Alternate Opening of Upper Deck of Double-Deck Elevator

Setup - Custom Time/Mass - Door Width**M-3-3-3-3**

- M** Module
 - 3** DCSS
 - 3** Setup
 - 3** Cust Time/Mass
 - 3** Door Width, mm
-

Enter actual door width (mm).

Door Width 1530mm < 1530mm

Allowable range = 500 to 1530 mm

Press BLUE-ENTER to change the door width.

Setup - Custom Time/Mass - Door Times - Discrete

M-3-3-3-4

- M Module
 - 3 DCSS
 - 3 Setup
 - 3 Cust Time/Mass
 - 4 Door Times
-

Specify the following values using the number keys.

Press BLUE-ENTER to change value.

OpeningTime1,ms
nnnnn <

GO ON

ClosingTime,ms
nnnnn <

GO ON

LimitRevTime,ms
nnnnn <

GO ON

NudgingTime,ms
nnnnn <

GO ON

HeavyOpnTime,ms
nnnnn <

GO ON

```
HeavyClsTime,ms
nnnnn <
```

GO ON

```
HeavyNdgTime,ms
nnnnn <
```

GO ON

```
** List End **
SET if done
```

Table 15

Door Time Parameter	Range
OpeningTime1,ms	1000-10,000 ms
ClosingTime,ms	1500-10,000 ms
LimitRevTime,ms	1000-10,000 ms
NudgingTime, ms	1500-12,000 ms
HeavyOpnTime,ms	1000-10,000 ms
HeavyClsTime,ms	1500-10,000 ms
HeavyNdgTime,ms	1500-12,000 ms

Setup - Custom Time/Mass - Door Times - Multidrop

M-3-3-3-4

- M Module
 - 3 DCSS
 - 3 Setup
 - 3 Cust Time/Mass
 - 4 Door Times
-

Specify the following values using the number keys.

Press BLUE-ENTER to change value.

NOTE: With A26 software and higher, Start Floor and End Floor appear on the service tool display. These parameters are used to set a different open and close time at a specific floor.

The following are the service tool display screens as they would appear in the default multidrop arrangement, where all floors would have the same operating time.

Start Floor
0 <

GO ON

End Floor
254 <

GO ON

OpeningTime,ms
nnnnn <

GO ON

ClosingTime,ms
nnnnn <

GO ON

```
LimitRevTime,ms
nnnnn <
```

GO ON

```
The folowing are
For all floors >
```

GO ON

```
NudgingTime,ms
nnnnn <
```

GO ON

```
** List End **
SET if done
```

Table 16

Door Time Parameter	Range
OpeningTime1	1000-10,000 ms
ClosingTime	1500-10,000 ms
LimitRevTime	1000-10,000 ms
NudgingTime	1500-12,000 ms

The example on this page shows how to set up the third landing to have a separate open and close time from the rest of the floors.

Enter Test M-3-3-3-4 on the service tool. The following display will appear:

```
Start Floor
0 <
```

Push GO ON and the End Floor display will be shown.

```
End Floor
254 < 2
```

Enter 2 for the third floor and then BLUE-ENTER. (i-MOTION™ II uses the same convention as motion control and the bottom floor is always 0).

```
End   Floor  
  2   <
```

Push BLUE-GO BACK to Start Floor and enter 2 and then BLUE-ENTER. The highest floor is always entered first.

```
Start Floor  
254 < 2
```

Enter 2

```
Start Floor  
  2   <
```

You can then use GO ON to scroll through the rest of the display.

```
End   Floor  
  2   <
```

Enter new opening time.

```
OpeningTime1, ms  
nnnnn <
```

Enter new closing time.

```
ClosingTime,ms  
nnnnn <
```

Enter new limited reversal time.

```
LimitRevTime,ms  
nnnnn <
```

The spelling in this box is as it appears on the service tool display because of the display size.

```
The following are  
for all floors >
```

Nudging time remains constant for all floors. Reset the i-MOTION board (M-3-3-8 or M-3-2-3). There will not be separate operating times for the third landing.

```
NudgingTime, ms  
nnnnn <
```

GO ON

```
** List End **  
SET if done
```

Once the separate floor(s) have been set up, the service tool display will look like the example below:

The display will not show the floors that have been set up differently. Refer to Test M-3-3-3-6 to see which floor ranges have been affected by the changes.

```
Start Floor  
0 <
```

GO ON

```
End Floor  
254 <
```

If the OpeningTime setting has been changed for one or more floors, the display will show "mixed" in the space where the time is normally displayed.

```
OpeningTime,ms  
mixed <
```

If the ClosingTime setting has been changed for one or more floors, the display will show "mixed" in the space where the time is normally displayed.

```
ClosingTime,ms  
mixed <
```

If the LimitRevTime setting has been changed for one or more floors, the display will show "mixed" in the space where the time is normally displayed.

```
LimitRevTime,ms  
mixed <
```

GO ON

```
The following are  
for all floors >
```

In order to view the custom times, go to the StartFloor and EndFloor displays and enter the floor(s) that have been separately setup.

```
NudgingTime,ms  
nnnnn <
```

GO ON

```
** List End **  
SET if done
```

Setup - Custom Time/Mass - Door Weights**M-3-3-3-5**

- M** Module
 - 3** DCSS
 - 3** Setup
 - 3** Cust Time/Mass
 - 5** Door Weight
-

Press GO ON to reveal further menu choices.

CarDoorWeight=1
NrmHallWeight=2>

GO ON

HvyHallWeight=3

Setup - Custom Time/Mass - Door Weights - CarDoorWeight

M-3-3-3-5-1

- M Module
 - 3 DCSS
 - 3 Setup
 - 3 Cust Time/Mass
 - 5 Door Weight
 - 1 CarDoorWeight
-

Enter actual car door weight in kg.

CarPanelWt, kg
200 <

Use number keys to enter car door weight in kg.

Range 10–300 kg

Press BLUE-ENTER to change value.

Setup - Custom Time/Mass - Door Weights - NrmHallWeight - Discrete

M-3-3-3-5-2

- M Module
- 3 DCSS
- 3 Setup
- 3 Cust Time/Mass
- 5 Door Weight
- 2 NrmHallWeight

Enter actual normal hall door weight in kg.

NrmHallPanel, kg
200 <

Use number keys to enter normal hall door weight in kg.

Range 10–300 kg

Press BLUE-ENTER to change value.

Setup - Custom Time/Mass - Door Weights - NrmHallWeight - Multidrop

M-3-3-3-5-2

- M Module
 - 3 DCSS
 - 3 Setup
 - 3 Cust Time/Mass
 - 5 Door Weight
 - 2 NrmHallWeight
-

In order to set up a floor that has a different weight hall door than the others in the building, the procedure is similar to setting up a separate door time.

The following examples show the service tool display screens as they would appear in the default multidrop arrangement, where all floors would have the same hall door weights.

Start Floor
0 <

GO ON

End Floor
254 <

GO ON

NrmHallPanel, kg
82 <

GO ON

** List End **
SET if done

The following examples show how to set up the third landing to have a separate hall door weight from the rest of the floors.

```
Start Floor
0 <
```

Push GO ON and the End Floor display will be shown.

```
End Floor
254 < 2
```

Enter 2 for the third floor and then BLUE-ENTER. i-MOTION™ II uses the same convention as Motion Control - the bottom floor is always 0.

```
End Floor
2 <
```

Push BLUE-GO BACK to Start Floor and enter 2 and then BLUE-ENTER (the highest floor is always entered first).

```
Start Floor
254 < 2
```

Enter 2

```
Start Floor
2 <
```

You can then use GO ON to scroll through the rest of the display.

```
End Floor
2 <
```

Enter the hall door panel weight for the special floor. This weight is in kilograms and is best obtained by physically weighing the door if original specifications are not available.

```
NrmHallPanel, kg
82 < 100
```

Reset the i-MOTION board (M-3-3-8 or M-3-2-3).

```
NrmHallPanel, kg  
100 <
```

There will now be a separate hall door weight for the third landing.

```
** List End **  
SET if done
```

Once the separate hall door(s) weight(s) have been set up, the service tool display will look like the following screens.

```
Start Floor  
0 <
```

The display will not show the floors that have been set up differently. Refer to Test M-3-3-3-6 to see which floor ranges have been affected by the changes.

```
End Floor  
254 <
```

If the NrmHallPanel setting has been changed for one or more floors, the display will show "mixed" in the space where the weight is normally displayed.

```
NrmHallPanel, kg  
mixed <
```

In order to view the custom times, go to the Start Floor and End Floor display and enter the floor(s) that have been separately setup.

```
** List End **  
SET if done
```

Setup - Custom Time/Mass - Door Weights - HvyHallWeights - Discrete

M-3-3-3-5-3

- M Module
- 3 DCSS
- 3 Setup
- 3 Cust Time/Mass
- 5 Door Weight
- 3 HvyHallWeight

Enter actual heavy hall door weight in kg.

HvyHallPanel, kg
200 <

Use number keys to enter heavy hall door weight in kg.

Range 10–300 kg.

Press BLUE-ENTER to change value.

Setup - Custom Time/Mass - Door Weights - HvyHallWeights - Multidrop

M-3-3-3-5-3

- M Module
 - 3 DCSS
 - 3 Setup
 - 3 Cust Time/Mass
 - 5 Door Weight
 - 3 HvyHallWeight
-

This item is not used for Multidrop operation. You will get the following message on the service tool is you try to access it:

Invalid Entry
SET to continue

Setup - Custom Time/Mass - Floor Ranges

M-3-3-3-5

- M Module
- 3 DCSS
- 3 Setup
- 3 Cust Time/Mass
- 6 Floor Ranges

This parameter is used to check which floors have been set to different door times or door weights from the rest of the floors using Tests M-3-3-3-4 (multidrop only) or M-3-3-3-5 (multidrop only). These screens are read-only. You will have to refer to Tests M-3-3-3-4 (multidrop only) or M-3-3-3-5 (multidrop only) for actual settings.

The default display is shown below. This shows that all floors are set for the same door time and all hall doors are set for the same weight.

Range: 1 of 1
Floors: 0 - 254

In the example shown below, the doors at the third opening have been setup for a door time or hall door weight different from all other floors.

The following screen shows that floors 0-1 have the same settings.

Range: 1 of 3
Floors: 0 - 1

This screen shows that floor two has different settings than the rest of the floors.

Range: 2 of 3
Floors: 2 - 2

This screen shows that floors 3-254 have the same settings.

Range: 3 of 3
Floors: 3 - 254

Setup – Custom Time/Mass – Force Items

M-3-3-4

- M Module
- 3 DCSS
- 3 Setup
- 4 Force Items

Table 17: Force Parameters that May Be Adjusted

SVT Name	Description	Range	Default	Incr
HoldCloseForce,N	Force used to hold the doors closed while traveling through the hoistway and while idle at floor level.	20-60	50	1
Stall Force,N	Force applied to close the doors while stalled.	50-160	115	1
CloserForce/Wt,N	Force or weight of the hoistway door closer (spirator or weighted door closer). This is used internally when closing the doors.	0-60	40	1
HoldOpenForce,N	Force applied to hold the doors in the fully open position.	0-60	20	1
FrictionTorq,mNm	The amount of torque required to overcome the friction in the system.	0-300	100	1
CSAHoldClosFrc,N	Canadian B44 Door Hold Close Force.	100-450	450	10

If HoldCloseForce or HoldOpenForce is too high, the door motor may overheat and cause a degraded profile operation.

The HoldOpenForce may be tuned by decreasing the value until the door begins to sag closed at the end of an open profile. Then increase it slightly until there is no sag.

4.45 Newtons = 1 lb. force.

Setup - Site Items - Advanced

M-3-3-5

M Module
3 DCSS
3 Setup
5 Advanced

Press GO ON to reveal further menu choices.

`ModifyProfile=1
Tuning items=2 >`

GO ON

`Other items=3`

Setup - Site Items - Advanced - Modify Profile

M-3-3-5-1

- M Module
 - 3 DCSS
 - 3 Setup
 - 5 Advanced
 - 1 Modify Profile
-

Profile items=1
Restor Orignl=2

Use the number keys to select item.

Setup - Site Items - Advanced - Modify Profile - Profile Items**M-3-3-5-1-1**

- M** Module
- 3** DCSS
- 3** Setup
- 5** Advanced
- 1** Modify Profile
- 1** Profile Items

This section allows the open and close profiles to be adjusted. Each profile may be modified individually. The active profile is shown on the bottom, left field of the service tool display. In the example below, the O1:Opn or normal open profile, is the active profile. To select a different profile, use the BLUE-UP or BLUE-DOWN keys, then BLUE-ENTER to select the desired profile option.

Profile Options:

O1:Opn1 Open, normal profile

C1:Cls1 Close, normal profile

Once the desired profile is selected, press the GO-ON key to access the individual profile elements.

Select profile
Op:Op < Op:Op

GO ON

dd:Start Dist,m
nnnn <

GO ON

Dd:StartVel,mm/s
nnnn <

GO ON

dd:Stop Dist, mm nnnn <

GO ON

dd:Stop Vel, mm/s nnnn <

GO ON

dd:Accel, mm/s/s nnnn <

GO ON

dd:Decel, mm/s/s nnnn <

GO ON

dd:Max Vel, mm/s nnnn <

GO ON

Dd:Jerk Time, ms nnnn <

The Figure 2 shows various elements in a profile that may be modified. The jerk portions of the profile are actually rounded, providing jerk times.

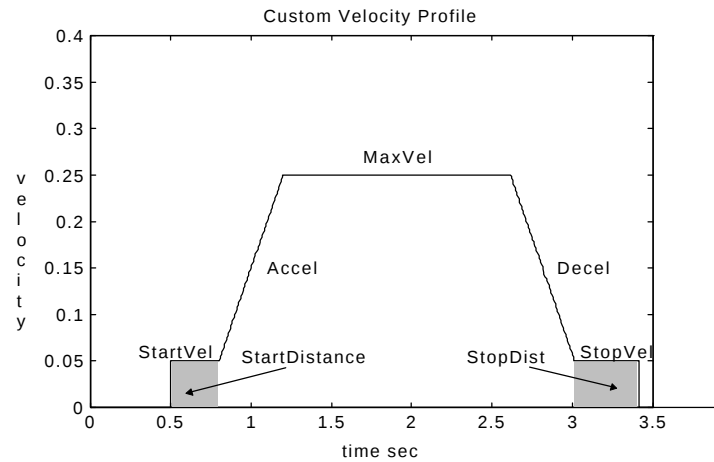


Figure 2

Table 18

SVT Name	Description	Range	Default		Incr
			SS / 2SP	C/O	
Start Dist, mm	Distance of slow speed travel at start of profile, coupling distance for open profiles (mm)	0-200	30-open 0-close	65-open 0-close	1
StartVel, mm/s	Slow speed velocity at start of profile, coupling velocity for open profiles (mm/s)	0-100	60-open 0-close	80-open 0-close	1
Stop Dist, mm	Distance of slow speed travel at end of profile, uncoupling distance for close profiles (mm/s)	0-200	0-open 75-close	0-open 55-close	1
Stop Vel, mm/s	Slow speed velocity at end of profile, uncoupling velocity for close profiles (mm/s)	0-100	0-open 75-close	0-open 55-close	1
Accel, mm/s/s	Profile acceleration (mm/s^2)	10-3000	1500-open 500-close	1500-open 1500-close	1
Decel, mm/s/s	Profile deceleration (mm/s^2)	10-3000	100-open 250 close	200-open 400-close	1
Max Vel, mm/s	Maximum Allowable Speed (mm/s)	100-4000	1500-open 350-close	1500-open 450-close	1
Jerk Time, ms	The length of time over which the corners of the velocity profile are rounded (milliseconds)	200-5000	300 normal 1000 increases smoothness but is slower	300-open 300-close	1

Setup - Advanced - Modify Profile - Restore Original

M-3-3-5-1-2

- M Module
- 3 DCSS
- 3 Setup
- 5 Advanced
- 1 Modify Profile
- 2 Restore Original

Restore the original values of the selected profile. These are the default values that came with the system baseline software. The user will be asked to identify the profile to restore. The lower left field indicates the present setting.

Select Profile
01:0pn< 01:0p

Each of the following profiles may be restored individually. Press BLUE-UP (or BLUE-DOWN) and BLUE-ENTER to access a different profile, then 1 to restore that profile.

Table 19

Profile Description
O1:Opn1 Open profile #1
C1:Cls1 Close profile #1

Use BLUE-UP and BLUE-ENTER to select the desired profile to restore. Then press GO-ON for the following screen to appear:

Restore prof C1?
Yes=1, No=2

Press 1 to restore the profile.

Restore *Done*
Press SET

Reset the i-MOTION™ II controller to save changes to the EEPROM.

Setup - Site Items - Advanced - Modify Profile - Tuning Items**M-3-3-5-2**

M Module
3 DCSS
3 Setup
5 Advanced
2 Tuning Items

Specify the following values using the number keys.

Press BLUE-ENTER to change value.

VelBandwidth
nn <

GO ON

PosBandwidth
nn <

NOTE: These parameters should never be changed from their default setting.

Table 20

SVT Name	Description	Range	Default	Incr
VelBandwidth	Bandwidth of velocity loop with car door only, radians/sec. Should be set to maximum value where doors do not vibrate. Decrease if doors vibrate, increase if doors overshoot on opening.	12-24	16	1
PosBandwidth	Bandwidth of position loop, radians/sec. Decrease if doors overshoot on opening, increase to track fast door times.	20-50	35	1

Setup - Advanced - Other Items

M-3-3-5-3

M Module
3 DCSS
3 Setup
5 Advanced
3 Other Items

Table 21

SVT Name	Description	Range	Default	Incr
TolerClosdGap,mm	Gap between the doors (or from s/s door to fully closed) and still report fully closed to the MCSS. Millimeters.	2-30	15	1
ToleranceOpn,mm	This is the distance the doors can be from fully open (DoorWidth) and still report fully open to the MCSS. Millimeters.	5-35	25	1
TolrPryOpnGap,mm	Gap between the doors (or from s/s door to fully closed) allowed while prying open before the motor(s) will ramp up the force and close the doors. Millimeters.	5-20	10	1
Gs1 Gap Width,mm	Gap between the doors (or from s/s door to fully closed) where the GS1 signal is activated. Used for Gate Switch Monitoring. Millimeters.	0-250	70	1

Setup - Features - Restore Flash**M-3-3-6**

- M** Module
 - 3** DCSS
 - 3** Setup
 - 6** Restore Flash
-

Use the number keys to select item.

Press BLUE-ENTER to change.

Default Params?
Yes=1, No=2

GO ON

DONE!, Must reset
Press SET

WARNING: Use this setting with caution, as the FLASH will default to its original factory-programming configuration, not to the default setup for your job. All job specific parameters will have to be re-entered.

Setup - Spare Options

M-3-3-7

- M Module
 - 3 DCSS
 - 3 Setup
 - 7 Spare Options
-

Use the number keys to select item.

Press BLUE-ENTER to change.

LWSS Type=1
Interface Type=2>

GO ON

MDC Baud Rate=3
Safety=4

Setup - Spare Options - LWSS Type**M-3-3-7-1**

M Module
3 DCSS
3 Setup
7 Spare Options
1 LWSS Type

Table 22

LWSS Type	Description
none	No load weighing
1LdCell	1 Load Cell
2LdCell	2 Load Cell
1Optron	1 Optron Device
2Optron	2 Optron Devices
LVDT	LVDT load weighing

Setup - Spare Options - Interface Type

M-3-3-7-2

- M Module
 - 3 DCSS
 - 3 Setup
 - 7 Spare Options
 - 2 Interface Type
-

Select communication interface type.

CommType
Multidrop<multidrop

Press 2 (UP) or 3 (Down) to select interface type.

Press BLUE-ENTER to change the interface.

The interface types available are shown in Table 23.

Table 23

Interface Type
Discrete
Multidrop

Discrete Interface used with all LVM (new equipment or mod) and some mod E411M-MS and E411M-VF controllers.

Multidrop interface used with all GEM / MVS / HVS controllers and some mod E411M-MS and E411M-VF controllers.

Check job specific documentation to find out if your mod job is discrete or multidrop.

Setup - Spare Options - Safety

M-3-3-7-3

- M** Module
- 3** DCSS
- 3** Setup
- 7** Spare Options
- 3** MDC Baud Rate

Select baud rate for multidrop communications.

CommBaud Rate
Br 9600 < Br 9600

Press 2 (UP) or 3 (DOWN) to select baud rate.

Press BLUE-ENTER to change the baud rate.

Table 24

Baud Rates
9600
19200

Select 9600 for all current applications.

Setup - Spare Options - Safety

M-3-3-7-4

- M Module
 - 3 DCSS
 - 3 Setup
 - 7 Spare Options
 - 4 Safety
-

Select appropriate safety code.

Safety Code ANSI < ANSI

Press 2 (UP) or 3 (Down) to select safety code.

Press BLUE-ENTER to change the safety code.

The safety codes available are shown in Table 25.

Table 25

Safety Codes
ANSI
B44
CEN
Australia

Setup - Reset**M-3-3-8**

M Module
3 DCSS
3 Setup
8 Reset

Selecting this option will reset the i-MOTION™ II controller. The service tool will display:

WAIT
ZZZZZ

GO ON

DCSS=3

It is best to perform this sequence while the doors are not in motion.

This is the same function as M-3-2-3.

Run

M-3-4

M Module
3 DCSS
4 Run

This feature allows the user to move the doors from the service tool. The status line is displayed on the first line. The second line provides door control options. The user presses the number of the desired door operation. For example, if the user wants to open the doors, the 1 key is pressed. It is not necessary to type BLUE-ENTER.

```
CL1  CL*  NRM ][  
0=off  1=open >
```

GO ON

```
CL1  CL*  NRM ][  
2=cl  3=nudge >
```

GO ON

```
CL1  CL*  NRM ][  
4=deenergize >
```

An asterisk (*) will appear next to the i-MOTION™ II command (second column of the status line). This asterisk indicates the user has control of the doors with the service tool.

off	=	Turn off the user commands (the asterisk disappears).
open	=	Open doors with the open 1 command.
cl	=	Close the doors.
nudge	=	Close the doors at nudging speed.
deenergize	=	De-energize the doors by removing power to the motor(s). The brake is also dropped.

NOTE 1: If you have difficulty disabling Manual Mode, press 4, de-energize, first and then press 0, off.

NOTE 2: Using this tool sequence will generate an event number 2808 on LMCSS systems.

Engineer - Engr Messages - Hidden Menu**M-3-5**

M Module
3 DCSS
5 Engineer

Use the number keys to select item.

Press BLUE-ENTER to change.

Engr Messages=1
Clear Messages=2

GO ON

Override Input=3
Override Output=4

GO ON

Engineer Item=5
Static Monitor=6

GO ON

Cycle Doors=7
Eng Tests=8

GO ON

Gear Ratio=9

Engineer - Engr Messages - Hidden Menu

M-3-5-1

- M** Module
 - 3** DCSS
 - 5** Engineer
 - 1** Engineer Messages
-

Door status messages are displayed here.

Engineer - Clear Messages - Hidden Menu

M-3-5-2

- M Module
 - 3 DCSS
 - 5 Engineer
 - 2 Clear Messages
-

i-MO Message Log
has been cleared

Engineer - Override Inputs - Hidden Menu

M-3-5-3

- M Module
- 3 DCSS
- 5 Engineer
- 3 Override Inputs

This screen allows the service tool user to force an input signal to a desired state, overriding the wired input signal state. Press 1 to force the input on, or active, and press 2 to force the input off, or inactive. Press 3 to deactivate the override feature, allowing the signal to be its default state. Press GO ON to scroll through input signals. Select DEF=3, default, when finished. Most of the input signal states may be monitored with M-3-1-3. Recycling the i-MOTION™ II controller, or performing a software reset with M-3-2-5 or M-3-3-9 will clear a forced override. The service tool must be directly connected to the i-MOTION™ II controller.

Table 26

Input Signal	Description
do1	Door Open Signal
do2	Door Open Signal
dc	Door Close Signal
ndg	Nudging Signal
hhd	Heavy Hall Door Signal
dhc	Door Hold Closed Signal
uls	Door Operator Limit Switch Signal
lls	Door Operator Limit Switch Signal
upb	Up Button Input (3-Button Interface)
dnb	Down Button Input (3-Button Interface)
entb	Enter Button Input (3-Button Interface)
pvtf	Not Used
dob	Door Open Button Signal
dso1	Door Safe To Open Signal
dso2	Door Safe To Open Signal
eds	Emergency Door Stop Signal
edp	Lambda Signal
lrd	Light Ray Signal
cdbp	Car Door Bypass Signal

Engineer - Override Outputs - Hidden Menu**M-3-5-4**

- M** Module
 - 3** DCSS
 - 5** Engineer
 - 4** Override Outputs
-

This screen allows the service tool user to force an output signal to a desired state, overriding the present output signal state. The service tool must be directly connected to the i-MOTION II controller. Press 1 to force the output channel on, or active, and press 2 to force the output channel off or inactive. Press 3 to deactivate the override feature, allowing the default value to be used. Press GO-ON to scroll through output signal options. The output state may be monitored with M-3-1-4.

Table 27

Output Signal	Description
dol	Door Open Limit
dcl	Door Close Limit
gsl	Gate Switch Monitor
rem	REM III®
OCIA	Over Current Interrupt Acknowledgment
shtdwn	Shutdown
ospr2	Spare - used for production testing

Engineer - Engineer Items - Hidden Menu

M-3-5-5

- M Module
 - 3 DCSS
 - 5 Engineer
 - 5 Engineer Items
-

This section includes the following engineering parameters. Normally, there is no need for field adjustment of these parameters through this service tool sequence.

NOTE: This is the location of four parameters changed during a Learn Run (DoorWidth, DCL pos, DOL pos, and Number Sec Slots).

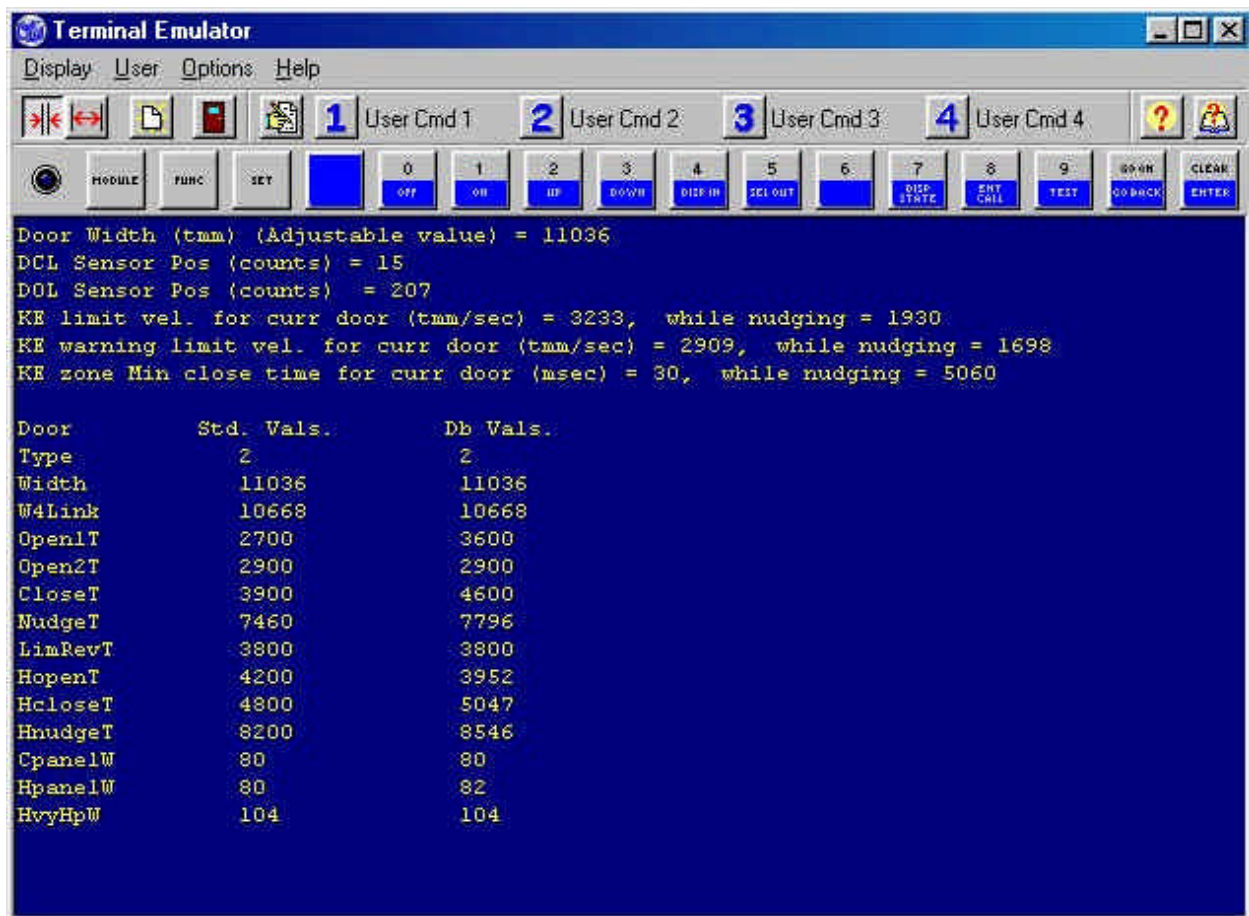
Table 28

SVT Name	Description	Range	Default	Incr
StartsPerHour	Number of door runs per hour while using the M-3-5-8, cycle doors test.	50-500	220	1
DCL pos, counts	Primary encoder count position of the position sensor used for DCL signal. Learned during Learn Run.	10-100	15	1
DOL pos, counts	Primary encoder count position of the DOL position. Learned during Learn Run.	150-350	207	1
MismtchTol, tmm	Allowable difference between primary and secondary positions without a fault.	10-50	15	1

Engineer - Static Monitor - Hidden Menu**M-3-5-6**

- M** Module
- 3** DCSS
- 5** Engineer
- 6** Static Monitor

This sequence is available only with Merlin. It is not available with the service tool.



Engineer - Cycle Doors - Hidden Menu

M-3-5-7

- M Module
 - 3 DCSS
 - 5 Engineer
 - 7 Cycle Doors
-

This option will allow the doors to automatically cycle open and closed. The number of open and close cycles per hour, StartsPerHour, may be adjusted using M-3-5-5.

DEN	CL	*	NRM	][
run=1	rv=2	stp=3		

Select 1 to cycle doors open and closed.

Select 2 to cycle doors open and closed with a reversal every fifth cycle.

Select 3 to stop cycling doors.

NOTE: The doors will only cycle with the service tool plugged into the i-MOTION™ II controller directly, and DSO is active (unless the CommType is discrete).

Engineer - Engineering Tests - Hidden Menu

M-3-5-8

M Module
3 DCSS
5 Engineer
8 Eng Test

This sequence is accessible only with MERLIN. It is not available with the service tool.

Enter Password:
>

Engineer - Engineering Tests - Hidden Menu

M-3-5-9

M Module
3 DCSS
5 Engineer
9 Eng Test

WARNING: Do not alter these numbers.

Table 29

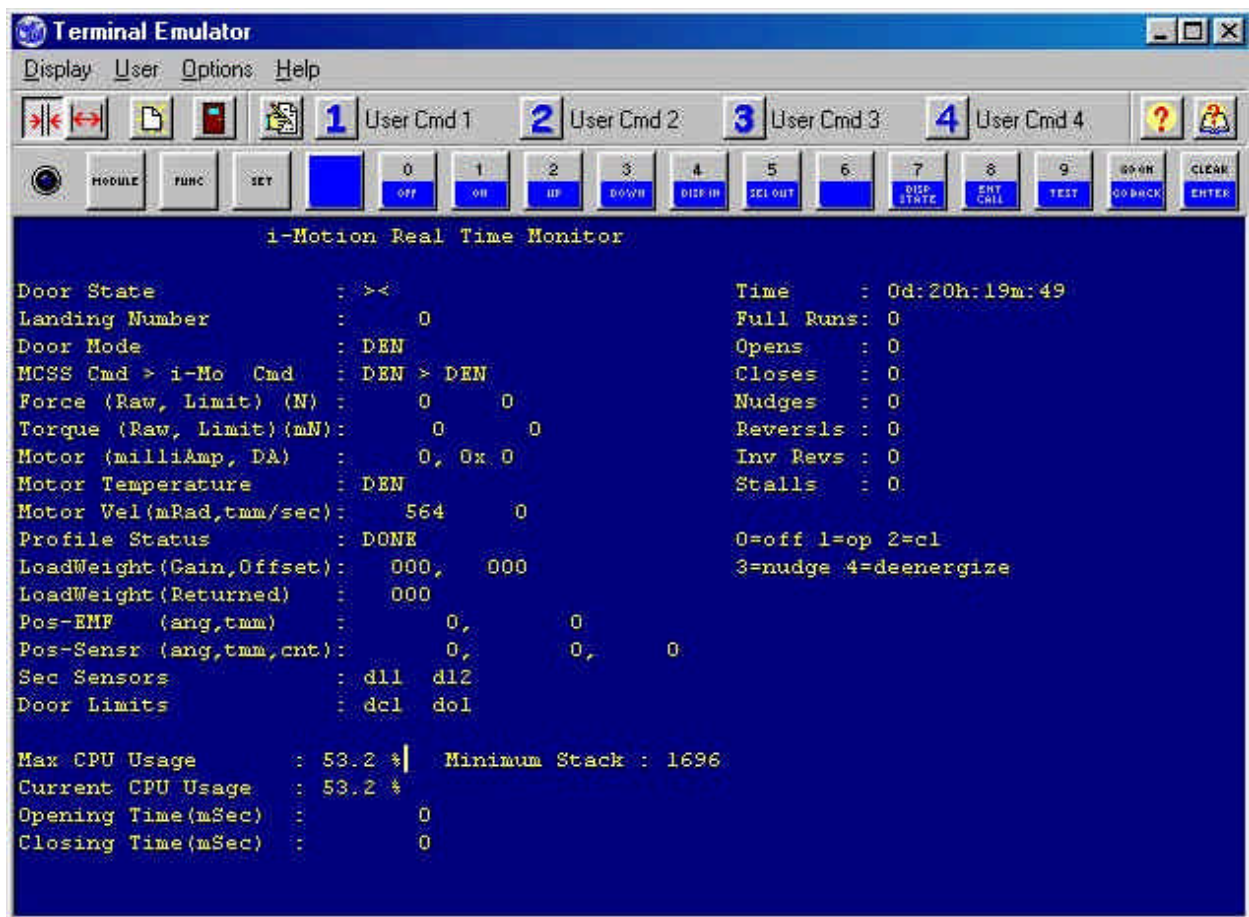
SVT Name	Range	Default	Incr
Mot2IntRate	100-1500	825	1
Int2TraRate	100-1500	550	1

Real Time Monitor - Hidden Menu

M-3-6

- M Module
- 3 DCSS
- 6 Real Time Monitor

This sequence is accessible only with MERLIN. It is not available with the service tool.



i-MOTION™ II Faults

NOTE: If the controller is powered down and then back on, the faults will remain in the i-MOTION™ II log.

The only way to clear the faults is to reset the i-MOTION™ II board using the 3-button interface or the service tool (M-3-2-3).

Door Limit Fault

Definition: The door close limit sensor (ULS or LLS – only one sensor will be present) has failed to turn on when the doors are fully closed, or failed to turn off when the doors are opening. The DOL signal is software generated and is not dependent on a sensor.

Action to Correct: Check the ULS or LLS sensor input. A red LED on the sensor will illuminate when the sensor is active. Display the inputs using the service tool (M-3-1-3). De-energize the doors and move by hand. Look for DCL and DOL to change state when the doors are fully open or closed. The mechanical stop bolt head is being read by the sensor in the closed position only. Ensure that the distance from the stop bolt head to the sensor does not exceed 3 mm.

Check the UPS and LPS sensors, as they are used to generate the software DOL signal.

This fault will not shut down the i-MOTION™ II system, but will result in a DTO or DTC being generated by the OCSS. There will be no scrolling message on the i-MOTION™ II display, but the fault will be visible in the Fault Log on the service tool (M-3-2-1). If a DTC fault is generated, the doors will continue to retry opening and closing. If the fault is corrected on the next door cycle, the fault disappears and the system continues running normally. A DTO fault will let the doors try three times before finally shutting down.

Encoder Mismatch

An Encoder Mismatch fault can occur when there is a UPS or LPS sensor fault, excessive BEMF from the motor, or insufficient 120 VDC at P8, pins 1–3 on the i-MOTION™ II board.

This fault may occur during reversals, when the intermediate pulley is heavily torqued. The sensor gap may increase momentarily at this point.

The UPS and LPS sensors are used in the same manner as an encoder. They provide position feedback to the control loop. They read the edges of the holes in the intermediate pulley. Back EMF Velocity Feedback is obtained from the motor terminal voltage and is used to provide velocity feedback to the control loop.

Check the UPS and LPS sensors by de-energizing the doors and using the service tool (M-3-1-6) to monitor the position (in 1/10 mm) and the number of counts (cnts) shown on the display. Moving the doors from the fully closed position toward fully open should display the opening width in 1/10 millimeters and a count of approximately 180–220 when the doors are fully open.

In most cases, the problem will be the sensor gap distance to the intermediate pulley. The sensor gap to the face of the pulley should not exceed 2.0 mm.

This fault may also be generated if the motor brushes hang up in the brush holders. Remove motor brushes and check that they move freely in the brush holders.

Unplug the motor armature wiring (P1) and check the resistance of the motor armature. It should be about 11 ohms. If this value is too high or too low, replace the motor.

If the 120 VDC input voltage is more than 10% low, you may encounter this fault. Check controller voltages.

During the Learn Run a “Wrong Direction” message is an encoder mismatch.

If the problem persists, you may have to replace the i-MOTION™ II board or motor.

This fault will stop the doors and try to re-open them. If the fault occurs three times in a row, the car will shut down, and an “Encoder Mismatch” message will scroll across the i-MOTION™ II display. The only way to clear the fault is to reset the i-MOTION™ II board (M-3-2-3 on the service tool).

Kinetic Ener Flt

Definition: The doors have exceeded the allowed kinetic energy in the close direction for the given weight of the doors.

Action to Correct: If the doors appear to be okay, then the car door weight is incorrect, the hall door weight is incorrect, or the door close time is too fast. The doors are traveling too fast for their weight. Check setup parameters for correct settings. Slow the door close speed. An Overspeed Fault will also be generated. The Kinetic Energy Fault will be declared at the end of the door travel.

When the fault occurs, the doors will stop and continue to close at initialization speed. If the fault recurs on three consecutive closes, the doors stop and allow only an open command. If an open command is received after the final close retry, the doors open at initialization speed, then shut down when fully open. A scrolling Kinetic Ener Flt message will be displayed on the i-MOTION™ II display. The i-MOTION™ II board must be reset to clear the fault (M-3-2-3 on the service tool). A warning message will be logged but not shown on the display if the doors reach 90% of the maximum allowed kinetic energy. This will not result in a shutdown. When the fault log (M-3-2-1) is viewed, an Overspeed fault may appear before the Kinetic Ener Flt.

Motr Over-current

Definition: CSA motor current requirement exceeded.

Action to Correct: Check for mechanical restrictions in door motion.

If the motor current is between 100% and 115% of its normal rated current, the operator will go into a Degraded Mode and run the doors at reduced speed and current. When the motor current goes below 85% of its rated current, the operator will restore normal operating speeds. One retry is allowed before system shutdown. If the operating current stays above 115% (1850 mA) of its rated current, the i-MOTION™ II board will shut down. The i-MOTION™ II board must be reset to clear the fault.

Comm Timeout

Definition: Communication failure between the LMCSS and the i-MOTION™ II board.

Action to Correct: If there has been no communication

between the LMCSS and i-MOTION™ II board for more than three seconds, this fault is declared. This fault is only used with multidrop. Not applicable to LVM or LRVF.

If the communication does not resume, the doors will open and remain open until communication has been restored. This fault does not shut down the i-MOTION™ II. Once communication has been restored, the operator will return to normal operation.

Overspeed

Definition: The doors have exceeded their allowed peak closing speed.

Action to Correct: This fault may occur before a Kinetic Energy Fault. This measurement is based on feedback from the door motor circuitry. Check setup parameters for proper type of doors and finishes.

When an overspeed fault occurs, the doors stop and continue to close at initialization speed. If the fault occurs on two consecutive closes, the doors stop and allow only an open command. If an open command is received, the doors open at initialization speed then shut down when the doors are fully open. The i-MOTION™ II system must be reset to clear the fault.

Short Ckt

Definition: Motor Short Circuit

Check motor brushes and commutator for excessive wear or damage. Replace motor if necessary.

Action to Correct: This fault will shut down the i-MOTION™ II system if a motor short circuit is detected. Overcurrent circuitry will sense a short circuit in the motor and generate an interrupt in the output. In order to prevent sporadic nuisance faults, the following sequence of events must occur before a shutdown:

1. A short circuit interrupt is generated.
2. The interrupt is acknowledged and the signal reset.
3. If another interrupt is generated within 10 micro-seconds it is deemed to be a real short circuit and the i-MOTION™ II board will be shut down.

If there is no other interrupt generated within 10 micro-seconds, the first interrupt is deemed to have been a sporadic signal and

the sequence reset, allowing the operator to run.

As soon as a Motor Short Circuit has been detected, the i-MOTION™ II system will de-energize the doors and shut down. i-MOTION™ II board must be reset to clear the fault. If the Motor Short Circuit cannot be cleared, it is suggested that both the motor and i-MOTION™ II processor board be replaced.

OverTempShutdown

Definition: The motor has drawn more current than expected and has shut down.

Action to Correct: Check for increased friction in the system by de-energizing the doors and operating them manually. Check that HoldOpenForce and HoldClosedForce in 3-3-4, DCSS - Setup - Force Items are not set too high. The default for HoldOpenForce is 20 N. and HoldCloseForce is 50 N. With power off, check motor brushes for wear or excessive carbon buildup.

There is no actual temperature sensor on the i-MOTION™ II door operator. This fault is generated similar to the Motor Overcurrent Fault, shown on the previous page.

Degraded Temp

Definition: The motor is drawing between 100% and 115% of normal motor current and is running in a degraded speed profile.

Action to Correct: See OverTemp shutdown (above).

* A retry is a successful open and close after a fault.

NOTE: Whenever possible, the doors are allowed a final open to avoid entrapments.

i-MOTION™ II Warnings and Informational Messages

NOTE: These messages are for information only and will not shut down the i-MOTION™ II door operator.

Lwcss Fault

Definition: Load weighing control sub-system fault.

Action to Correct: No load weighing data is being received. Check load cells or LVDT for proper output.

This message can also be generated during load weighing set up.

LmcssOverrunErr LmcssParityErr LmcssFrameErr

Definition: These are all communication faults generated by the multi-drop communication link.

Action to Correct: There is no need to be concerned with a few of these messages being generated during normal operation. If they show up in the LMCSS log in large numbers, check the LMCSS log to see if they are being generated by the LMCSS transmitting to or receiving from the i-MOTION™ II processor board (2400 series faults). This will give you a good idea where the problem is located.

Wrn: Doors Stalled

Definition: The doors have been prevented from moving.

Action to Correct: De-energize the doors and move the doors manually to check for excessive friction or anything preventing smooth movement.

These messages can be generated if the doors are blocked without activating a reversal device. A few messages will be normal, but if many warnings are generated, they may indicate excessive friction in some part of the system. If the doors are set to open too quickly, this warning may also be generated.

Wrn: Door Pried Open

Definition: This warning will be displayed if the doors were forced open when they were fully closed.

Action to Correct: None

This message will be shown if the door was pried open to a distance set in M-3-3-5-3, DCSS – Setup – Advanced –

Other Items (TolrPryOpnGap). This distance is measured in millimeters (Default = 10mm) and when reached, the motor will ramp up the force to close the doors.

Wrn: Big Recalibration **Definition:** A large position error was corrected (>4 mm) The position is re-zeroed when the doors are in the fully closed position.

Action to Correct: Perform a new Learn Run. Check position sensors UPS and LPS for proper clearance from intermediate pulley and check intermediate pulley for looseness or wobble on shaft.

This means that when the doors reached the fully closed position, the error in the distance count calculation was more than 4 mm from actual position.

Wrn: Kinetic Energy See Kinetic Energy Fault for explanation.

NOTE: The LMCSS & LWCSS faults will only show up on traction units.

Mass in Kilograms for Various Center-Opening Door Panels

Table 30: Standard Otis Doors

Opening Height	7 ft. (2134 mm)	8 ft. (2438 mm)	9 ft. (2743 mm)	10 ft. (3048 mm)
Baked Enamel Finish	mass (kg)	mass (kg)	mass (kg)	mass (kg)
Opening Width				
32 in. (813 mm)	28 kg	32 kg	36 kg	40 kg
36 in. (914 mm)	31 kg	36 kg	40 kg	45 kg
42 in. (1067 mm)	36 kg	42 kg	47 kg	52 kg
48 in. (1219 mm)	41 kg	47 kg	53 kg	59 kg
54 in. (1372 mm)	46 kg	53 kg	60 kg	66 kg
60 in. (1524 mm)	51 kg	59 kg	66 kg	73 kg
Stainless Steel Finish				
Opening Width				
32 in. (813 mm)	35 kg	40 kg	45 kg	49 kg
36 in. (914 mm)	39 kg	44 kg	50 kg	55 kg
42 in. (1067 mm)	45 kg	52 kg	58 kg	64 kg
48 in. (1219 mm)	51 kg	59 kg	66 kg	73 kg
54 in. (1372 mm)	58 kg	66 kg	74 kg	82 kg
60 in. (1524 mm)	64 kg	73 kg	82 kg	91 kg
Bronze Finish				
Opening Width				
32 in. (813 mm)	36 kg	41 kg	46 kg	51 kg
36 in. (914 mm)	40 kg	46 kg	51 kg	57 kg
42 in. (1067 mm)	47 kg	53 kg	60 kg	66 kg
48 in. (1219 mm)	53 kg	60 kg	68 kg	75 kg
54 in. (1372 mm)	59 kg	68 kg	76 kg	84 kg
60 in. (1524 mm)	66 kg	75 kg	84 kg	94 kg

Mass in Kilograms for Various Single-Slide Door Panels

Table 31: Standard Otis Doors

Opening Height	7 ft. (2134 mm)	8 ft. (2438 mm)	9 ft. (2743 mm)	10 ft. (3048 mm)
Baked Enamel Finish	mass (kg)	mass (kg)	mass (kg)	mass (kg)
Opening Width				
32 in. (813 mm)	56 kg	64 kg	72 kg	80 kg
36 in. (914 mm)	63 kg	72 kg	81 kg	89 kg
42 in. (1067 mm)	73 kg	83 kg	93 kg	104 kg
48 in. (1219 mm)	83 kg	94 kg	106 kg	118 kg
54 in. (1372 mm)	93 kg	106 kg	119 kg	132 kg
Stainless Steel Finish				
Opening Width				
32 in. (813 mm)	70 kg	79 kg	89 kg	99 kg
36 in. (914 mm)	78 kg	89 kg	100 kg	111 kg
42 in. (1067 mm)	90 kg	103 kg	116 kg	129 kg
48 in. (1219 mm)	103 kg	117 kg	132 kg	146 kg
54 in. (1372 mm)	115 kg	131 kg	148 kg	164 kg
Bronze Finish				
Opening Width				
32 in. (813 mm)	72 kg	82 kg	92 kg	102 kg
36 in. (914 mm)	80 kg	92 kg	103 kg	114 kg
42 in. (1067 mm)	93 kg	106 kg	119 kg	133 kg
48 in. (1219 mm)	106 kg	121 kg	136 kg	151 kg
54 in. (1372 mm)	119 kg	135 kg	152 kg	169 kg