Installation Manual

System Components:
The Navigator is supplied with the following assemblies, top tape bracket, bottom tape bracket, car top bracket, sensor head mounted to control box, 3-inch wide punched steel tape approximately the length of the elevator travel plus 10 feet and a roll of reflective tape. Each assembly will be discussed below in the appropriate order of installation. Depending on the requirements of the specific installation the control box may include, in addition to the Navigator control board, a Relay Interface board and/or a 24 VDC power supply.

Selector Operation
The Navigator uses an array of sensors to read the punched holes and special reflective tape on the steel tape. Two through scan type sensors are precisely positioned on the sensor head to provide both position and directional information to the on board microprocessor. Two other infra red sensors read pieces of pre-cut reflective tape to provide an absolute leveling signal. This is a redundant signal, which serves as a backup to the signal provided by the hole count. It also provides a more accurate and repeatable floor level positioning. Finally, the microprocessor uses this signal to reset the hole count at each floor. A sensor located between the two leveling sensors provides the door zone signal. A fourth sensor located adjacent to the door zone sensor reads a piece of tape mounted only at the bottom floor and is used to reset the hole count. The bottom count always starts at the number 2000. Each count represents about ½ inch of movement.

Digital Connection
When the NAVIGATOR is installed with an AMI-300 Elevator controller uses a digital two-wire system to communicate floor position to the controller. The communication is set for use with a twisted pair of telephone wires. If a twisted pair is not available contact AMI for instructions on using standard wires for this communication. The two-wire communication is connected a the 4 terminal connector at terminals A & B.
Navigator Sensor Head
(Tape Side)

Punched steel tape

Dual through-scan sensors

Tape guides are spring loaded for fast replacement without disassembly

Leveling sensors

Door zone sensor

Reset tape sensor
Tape Installation (See addendum #2)

CAUTION! Always wear work gloves when handling the steel tape

1. Install the top tape bracket first. (see FIG. 1)
2. The top tape bracket should be placed approximately 2 feet above the top limit of travel of the sensor head. The tape length supplied is approximately equal to travel plus 10 feet. Since the sensor/control will be mounted to the cross head consider overhead space requirements when locating the tape.
3. Note both the tape bracket and the angle to which the tape attaches are adjustable. The best location is for the tape to be as close to the guide rail as possible and the bracket extended the least distance.
4. After the bracket is installed slide the angle into the desired location. DO NOT TIGHTEN.
5. Attached the top end of the tape (the top end has only one hole centered on the tape. NOTE the punched holes in the steel tape should be on the right when facing the tape standing on the car top.). The tape is fastened using the center bolt on the angle. Slide the sides of the tape under the bolt heads that hold the angle to the bracket. Tighten the center bolt.
6. Tighten the angle to the bracket and note the distance from the center of the guide rail to the center of the tape, this will be needed to align the bottom bracket and the sensor/control. 
7. Let the tape unroll slowly until it is completely unrolled. Check for obstruction in the hoistway that may interfere with the sensor head.
1. Install the bottom bracket approximately 8 inches below the end of the tape. (see FIG. 2)
2. Move the angle so that it is the same distance from the guide rails as the top angle. Tighten the bolts.
3. Attach the tensioning springs between the eyebolts and the two punched holes in the bottom of the tape.
4. Use the jam nuts on the eyebolts to tension the tape. If a more adjustment is needed than the eyebolts can provide the whole bracket may be repositioned.
5. **Do not over tension the springs.** The tape needs to be able to absorb about 1 inch of movement and return to position.
1. The Navigator is supplied with (2) 2 inch long 3/8-inch bolts and nuts to attach the car top bracket to the crosshead. The installer will have to drill two holes in the crosshead and the bracket as shown in FIG. 3. The car top bracket should be mounted in a manner that results in the least cantilever distance in both directions.

2. The control box and sensor head is attached to the Unistrut bracket with two 5/16-inch bolts and nuts.

3. Note the Sensor head is shipped with only the right side set of guides attached. The other two guides are inside the control box. To install the sensor head carefully slide the tape into the right side guides be sure not to damage the two through scan sensors.

4. Slide the lower left-hand guide onto the tape. Position the base of the guide shoe under its set of brass colored tabs. Use the base of the guide to pry up the tabs so that it clears the shoulder on the guide shoe and at the same time slide it under the tab until it snaps into place. You may have to hold the tab so that it does not twist out of place. You may use a small screwdriver to help pry up the tab however, be careful not to damage a sensor.

5. When both guide shoes are in place set the control box so that the tape is free in the guides and the sensor head is not pulling the tape in nor pushing it out. Now tighten the two 3/8-inch bolts on the Unistrut to fix the box in this position.
**Navigator Control Board**

1. **Output LED's**
2. **Input Connections/LED's**
3. **Plug-in output Transistors-12 Total**
4. **J1 and J2 (12 Terminals)**
   - Are +24VDC Outputs.
   - See Controller Diagram for connections.

**Programming Buttons**
- <S2> Blue Button
- <S3> White Button

**The Display**
- Will show a floor number when the elevator is in a Floor Zone.
- Outside of a Floor Zone a 0 will be displayed.

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**Navigator Set Up**

1. Move the car to the bottom floor (floor Level)
2. Connect the 24 VDC power to the terminals as shown above. If a separate 24 VDC supply is provided with the Navigator there will be a separate connection diagram provided. When the unit is turned on the two * symbols in the middle of the display will flash alternatively to indicate the processor is working.
3. Connect the output wires as shown on the wiring prints. **NOTE:** on elevators serving more than four stops a digital connection is used in place of the floor outputs—see the wiring diagram for connection information.

4. Move the car so that it is **floor level** at the lowest landing served.

5. Affix the provided magnetic template to the steel tape with writing facing you so that it rests against the Level Down sensor on the sensor head. (See the Tool diagram at the back of the manual)

6. Move the car up until the sensor head is clear of the template. Place a piece of the pre-cut leveling reflective tape as shown on the template. Then at the lowest landing only place the reset tape (a pre-cut 3-inch piece is supplied) as indicated on the tool. **NOTE!** Before affixing the sensor tape to the steel tape the area must be clean.

7. Proceed to the next floor and repeat the process until the leveling tapes are installed at all floors to be served by the elevator.

8. Return the car to the bottom landing at **FLOOR LEVEL.** Car must be level at the first floor to start the programming mode. See Note below.

**NOTE:** The Navigator is at **floor level** when the Level Up (LU) and the Level Down (LD) red indicator lights are OFF, and the Door Zone (DZ) red light is ON. At the lowest landing the FZ1 light may also be on. To increase the Dead Zone cut equal lengths of tape from both ends of the Leveling Tape. To decrease the Dead Zone add equal amounts of tape to both ends of the Leveling Tape. The Tape may overlap. Equal amounts are added or removed from the Leveling Tape to maintain the floor level position. The floor level can be changed by adding a piece of reflective tape to one end of the floor’s leveling tape and removing an equal amount from the other end. (e.g. to lower the floor level at a floor by 1 inch. Remove 1 inch of tape off the top and add 1 inch to the bottom.

On the Navigator control board Press **S2 and S3** at the same time to enter programming mode. The display back-light will illuminate and will display the following:

```
<S3> = Set Floors
<S2> = Slowdowns
```

Press the **S3** switch the display will change to:

```
Push <S2> if Car Is level @ Pos.1
```

Push **S2** the display will change to:
The above message will appear whenever the elevator is in the Door Zone i.e. the DZ red light is on. When not in a door zone the below message will be displayed.

The Navigator automatically sets the floor counts as it passes the dead zones of the leveling tapes previously installed. Run the car on inspection from the bottom to past the top dead zone. Stopping while running to the top will not affect the programming provided that <S3> is not pushed.

While the car is running in the program mode the display will show the floor count and the numerical count or position. The Floor Count will increment each time the Navigator sees a floor (a dead zone plus door zone). The position number will start at 2000 and increment each ½ inch when going up and decrement when going down.

When the full hoistway run to the top is complete press S3 and the display will momentarily display the floor count as a confirmation, then the screen display will ask you to adjust the UP Slowdown position. The adjustment is the number of inches below the floors to initiate the slowdown valve sequence for an upward traveling car. The Navigator will automatically set all floors to this up slowdown distance.
When <S3> is pushed the display will show the following.

```
Push <S2> to save
Current Value = ##
```

When the desired UP Slowdown distance is displayed release S3 and push S2. The Display will change to ask for setting the DOWN slowdown distance for all floors.

```
Push and Hold <S3>
For +/- DN SLDWN
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When S3 is pushed the display will change to:

```
Push <S2> to Save
Current Value = ##
```

When S2 is pushed the Navigator is ready for automatic operation. Make sure that the Navigator has exited the programming mode. The Navigator is in normal mode when the alternating flashing * are visible.
TIP! The magnetic template will be easier to place if you use a small screwdriver between the tool and the steel tape to hold the tool away from the tape until it rests on top leveling sensor.
Navigator Manual Addendum #1
Eliminating false reflections

The steel tape can cause false reflections to the four reflective sensors on the Navigator. These are the sensors for level up, level down, door zone and reset. The hole-counting sensors are not affected. This situation can be eliminated by “peppering” the steel tape with a flat black spray paint (do not paint solid). This is best done after the steel tape is hung but before the reflective leveling tapes are added. However, if the leveling tapes are installed cover them with a piece of cardboard to protect them from the spray. The cardboard can also be held behind the steel tape to protect against over spray.
Navigator Manual Addendum #2
Alternate Steel Tape Attachment
Caution! Work gloves should be worn when handling the steel tape.

The above drawing shows a bracket that may be different from the one supplied.

This Addendum describes an alternate method for hanging the steel tape on the top bracket.

1. Attach the tape brackets to the guide rail as described in the manual. In place of a single hole at the top of the tape there is a 90-degree bend. The bottom of the tape will have two holes for connecting the tensioning springs to the tape.
2. Starting at the top of the hoistway (the top tape bracket should be mounted at least two feet higher than the maximum travel of the elevator) place the tape against the bracket with the bend facing away from the car. Secure the steel tape to the bracket with the 4-inch angle and the two 3/8-inch bolts and captive nuts. HINT: The captive nuts can be turned so that they will fit in the slot of the Unistrut bracket then turned back to the captive position before tightening the bolts.
3. See the manual for instructions on installing the bottom bracket and tensioning springs.