

EMERGENCY TERMINAL SLOWDOWN DETECTION SYSTEM

INSTALLATION AND OPERATING INSTRUCTIONS

1. GENERAL OPERATION.

The Emergency Terminal Slowdown Detection (ETSD) System consists of switches mounted in the shaft at the terminal landings, and a High Speed Counter Card in the Programmable Logic Controller (PLC).

When the car travels to the terminal landing, the car rides onto one of the ETSD switches which initiates the speed checking sequence. The speed of the car is monitored as the car decelerates toward the terminal landing, and a shutdown is initiated if the car speed exceeds the sample car speed by an adjustable error value. The sample car speed is set in setup mode, by running the car into the terminal landings. The PLC will develop a table based on this sample run, and use it as a basis for checking the car speed at other times.

If the car does not slow down properly, the run outputs will be de-energized, and the car will stop on the brake. The controller can be set up to reset automatically, or remain shutdown. The controller will register the fault in its fault log, which can be accessed at a later time. It will also record the car speed at the time of the fault, the sample car speed, and the sample car speed table pointer.

The ETSD Switches are checked against floor position to verify they are operating properly. The High Speed Counter also checks the car speed for other errors, such as overspeed, exceeding 150fpm on Inspection, exceeding 50fpm with the doors open, running the wrong direction, and tach/encoder loss.

2. INSTALLATION and SETUP.

The ETSD switches are normally closed hatch switches that open when the car reaches a terminal landing. (Normally open switches may be used if the appropriate feature adjust setting is changed) The switches may be reset as the car continues into the floor. The switches should be set as close to the Terminal Landing Slowdown Limit Switches as possible. The High Speed Counter is connected as shown on the schematics.

During installation, jump the ETSD Setup Input and the High Speed Counter Defeat Input. Check the schematic for the location of these inputs. This will disable the features until the system is fully adjusted. Do not remove the jumpers until the installation is completed.

When the controller has been fully installed, and the speeds and deceleration rates have been adjusted, then set up the HSC by following steps 2a to 2d, and set up the ETSD by following step 2e:

2a. Cycle the power to the controller.

2b. Run the car up at contract speed. Do NOT allow the car to overspeed. (If it does, go to step 2a). The HSC Up Output should pulse on (if provided, see the Feature Adjust Sheet). Also Register R30 is positive in the up direction. If it is negative, reverse A+ and B+ leads on the High Speed Counter module, and start again.

2c. Turn off the power, then remove the High Speed Counter Defeat Jumper.

2d. Turn on the power. Run the car up at contract speed. If a High Speed Counter fault occurs, check Register R30 (see step 2b). If necessary, reverse A+ and B+ leads on the High Speed Counter module, and start again.

2e. Run the car into both terminal landings from one floor away, from two floors away (if the car does not reach full speed on a one floor run), from three floors away (if the car does not reach full speed on a two floor run), etc until the car has been run into the terminal landings at each speed. It is recommended that the runs be done empty car up, and full car down, to give the worst possible conditions for the sample runs. This will build the ETSD tables. Remove the jumper to the ETSD Setup Input. Setup is now complete.

Note: If the speeds or deceleration rate are changed then repeat step 2e, to build a new ETSD table. To check the ETSD operation, monitor the ETSD Speed Error Register (R513).

Note: For the purposes of doing Buffer and Safety Tests, jump the Shutdown Defeat Input only. Check the schematic for the location of this input. Do not jump the High Speed Counter Defeat Input or the ETSD Setup Input as this will change setup of the HSC and ETSD. See Drive Parameter Sheets for instructions on over-speeding the elevator. Remove jumper from Shutdown Defeat Input when tests are complete.

3. ADJUSTMENTS.

This table shows the components of the ETSD system. The ETSD Allowable Error Register can be changed using the Field Adjustment feature. All registers can be viewed or changed using a GE 9030 Hand-Held Programmer or a computer running GE Logicmaster LM90 software.

<u>Function</u>	<u>Description</u>
ETSD Setup Input (See schematic for location)	Disables ETSD feature and initiates setup mode. (See step 2e at left.)
Up and Down High/Full Speed ETSD Inputs (Repeat for each car speed)	Starts the ETSD feature for a full speed run into the terminal landings. (Activated when the car is just beyond the High Speed Slowdown Limit Switch.) Repeat for each car speed (One Floor Run, Two Floor Run, etc.). Set the Switches just beyond the Terminal Ldg Slowdown Switches for that speed.
ETSD Output (See schematic for location)	Energized when the feature has detected an overspeed condition. The car will stop on the brake. The car can be set up to automatically reset, or remain shutdown. (See Adjustable Feature description.)
ETSD Allowable Error Register (See Field Adjustment Instructions for Register Number)	When the ETSD feature is initiated, if the actual speed minus the sample speed exceeds the ETSD Allowable Error value, the car will stop. This value is factory set at the value corresponding to 25fpm, and may be changed as described in the Field Adjustment procedure. (Speeds are stored as motor rpm values.)
ETSD Sample Speed Register (R512)	The sample speed from the table created during setup. It is the speed the car should be running at this point in the run.
ETSD Speed Error Register (R513)	The current speed error. This is the actual car speed minus the sample car speed. If the elevator is running consistently, this value should be close to zero.
ETSD Fault Speed Register (R514)	The actual car speed when the ETSD system detected a fault.
ETSD Fault Table Pointer Register (R515)	The pointer for the sample speed table when the ETSD system detected a fault. This shows which sample table was being used, and when the fault occurred.
ETSD Fault Sample Speed Register (R516)	The sample speed (R512) when the ETSD system detected a fault. This is the speed the car should have been running.
ETSD Fault Speed Error Register (R517)	The error value (R513) when the ETSD system detected a fault. This is the value of R514 minus R516.
ETSD Tables - Each speed takes 20 registers (10 up values, then 10 down) 1 Floor Run Up (R520-9) 1 Floor Run Down (R530-9) 2 Floor Run Up (R540-9) 2 Floor Run Down (R550-9) (repeated for other speeds, as required)	Each group of ten registers contains the sample speeds for a run into the terminal landing in a particular direction. The values represent the car speed taken at regular intervals during the slowdown, and are approximately equal to the motor rpm at that speed. They will be positive for the up direction and negative for the down direction. Values are set automatically by means of the setup mode, but can be changed with a GE 9030 Hand-Held Programmer or GE 9030 Logicmaster software. To monitor the system, run the car into the terminal landing in the setup mode, and monitor R513 under different loads. The ETSD Allowable Error Register should be adjusted to allow normal slowdown within the variations observed. The values in each table should decrease. The down values should be the complement of the up values.
Fault Log Error Codes	A Fault Log Error Code (usually "0B" for a High Speed Counter Fault, and "0C" for an ETSD fault) will be generated whenever an ETSD system overspeed fault occurs. Refer to the Fault Log instructions for further details.