

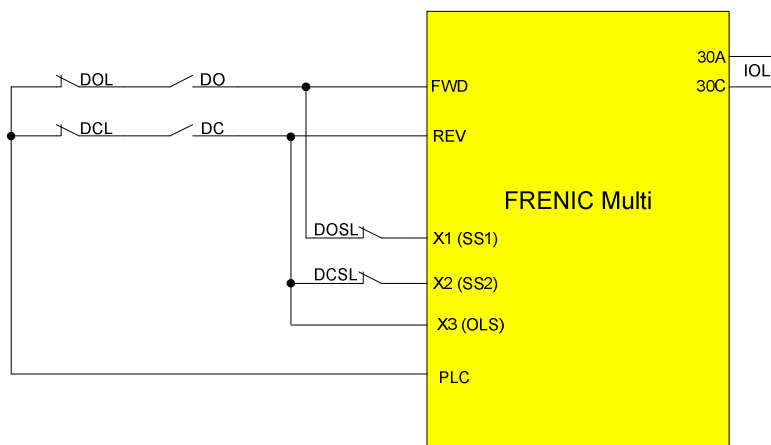


Application Note

Overload Stop with FRENIC Multi

Application: elevator door control

Control signals wiring.



Control signals used.

- DOL: mechanic limit switch door open
- DCL: mechanic limit switch door close
- DO: door opening signal
- DC: door closing signal
- DOSL: secondary limit switch during door opening
- DCSL: secondary limit switch during door closing

- PLC: internal 24V supply
- REV: rotation direction
- FWD: rotation direction

- X1: multistep frequency selection 1 (SS1)
- X2: multistep frequency selection 2 (SS2)
- X3: overload stopping effective command (OLS)

- 30A/C: inverter output limiting (IOL)



Basic application requirements.

Smooth door closing and opening operation with no banging of the doors.

Interrupt detection at door closing (by using *Overload Stop* function).

Test results.

By using torque vector control with overload detection a smooth operation and avoidance of door banging is achieved.

Due to the overload detection an interrupt at closing of the elevator door is detected from start of close operation up to about 2 cm gap between the doors. This value could be reduced further by changing the position of the mechanical limit switch inside the door.

Functions changed from default setting.

Basic functions

F07:	2.5	Acceleration Time in s
F08:	1.5	Deceleration Time in s
F42:	1	Dynamic torque vector control
F20:	0.2	DC Braking starting frequency in Hz
F21:	90	Braking level in %
F24:	0.2	Stop frequency in Hz
F39:	1.00	Stop frequency holding time in s
E01:	1	Multistep frequency selection 1
E02:	2	Multistep frequency selection 2
E03:	46	Overload stopping effective command
C01:	21	Multistep frequency 1 in Hz
C02:	20	Multistep frequency 2 in Hz

Overload Stop functions

J63:	0	Detection value (0: torque; 1: current)
J64:	30	Detection level in %
J65:	2	Mode selection
J66:	2	Operation condition

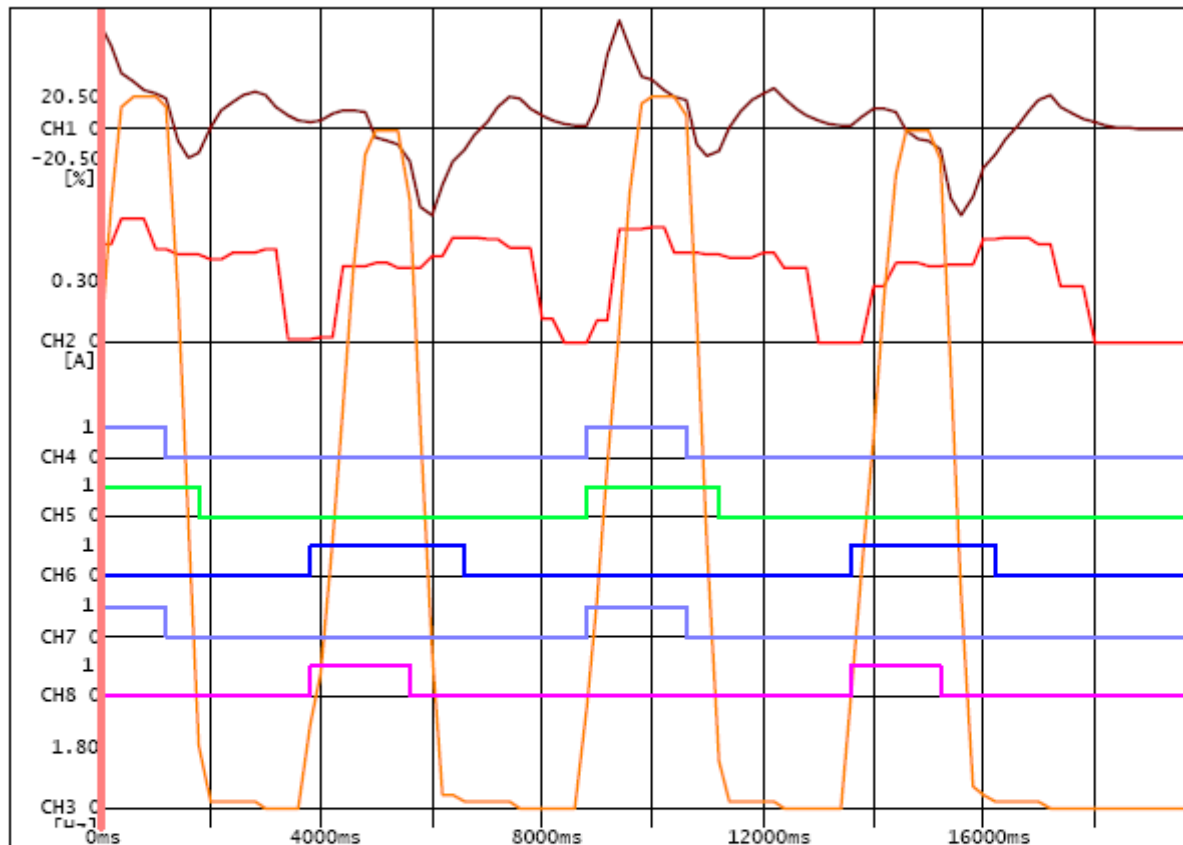
Appendix.

- Trace 1: Normal operation
- Trace 2: Interrupt at high speed
- Trace 3: Interrupt at low speed



Trace 1: Normal operation

Real time trace
 File name:RMonitor1 final2 normal operation.RTM
 Date:2006"NI10Z13"019Z230."



- CH1:Output torque:
- CH2:Output current:
- CH3:Output frequency (before slip):
- CH4:X1 terminal:
- CH5:FWD terminal:
- CH6:REV terminal:
- CH7:X1 terminal:
- CH8:X2 terminal:

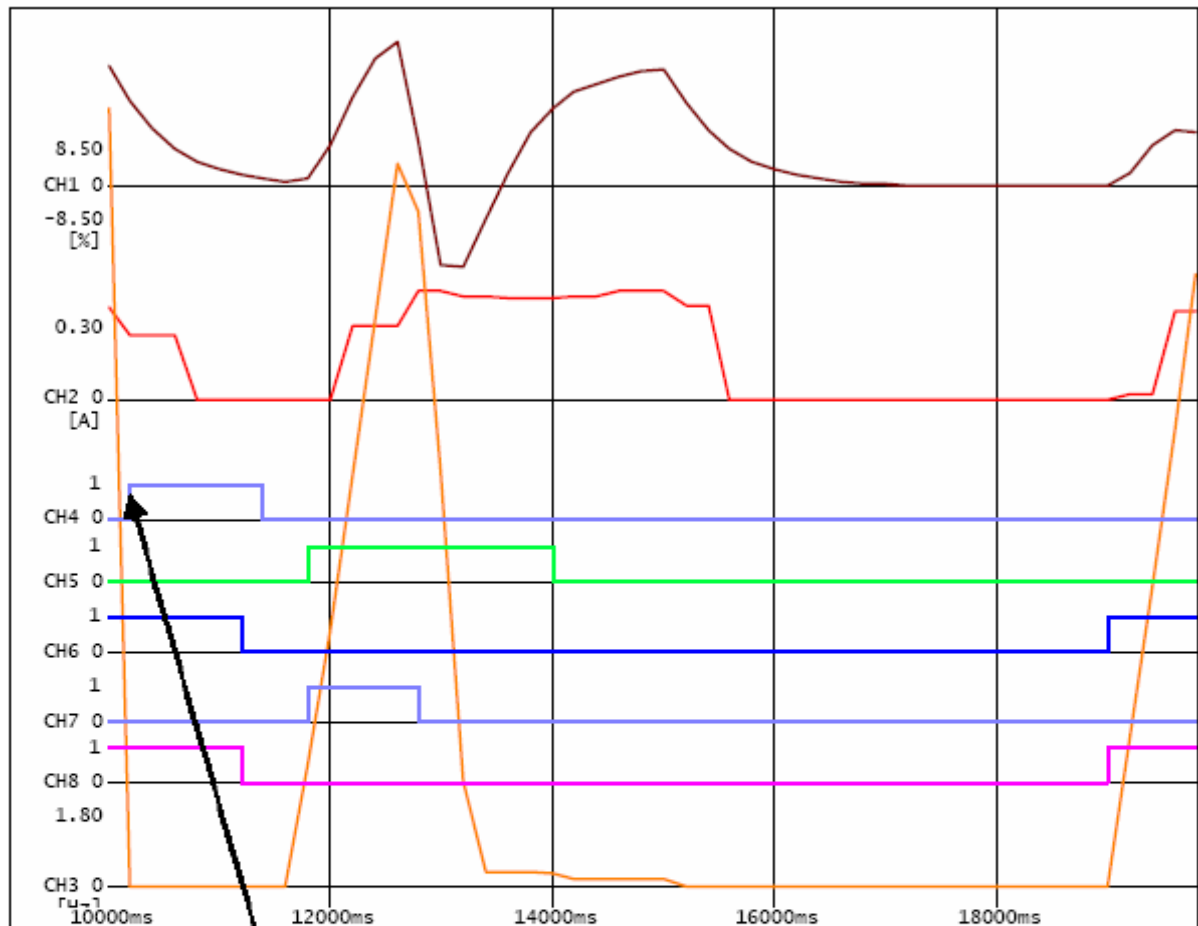
This real time trace is normal operation of elevator door (CABIN DOOR) along with floor door operation.
 OPEN, CLOSE, OPEN & CLOSE OPERATION

Time axis:20000[ms]
 Sampling time:200 [ms]



Trace 2: Interrupt at high speed

Real time trace
 File name:RMonitor1 final2 with interrupt operation.RTM
 Date:2006"NI10E213"019Z237.*



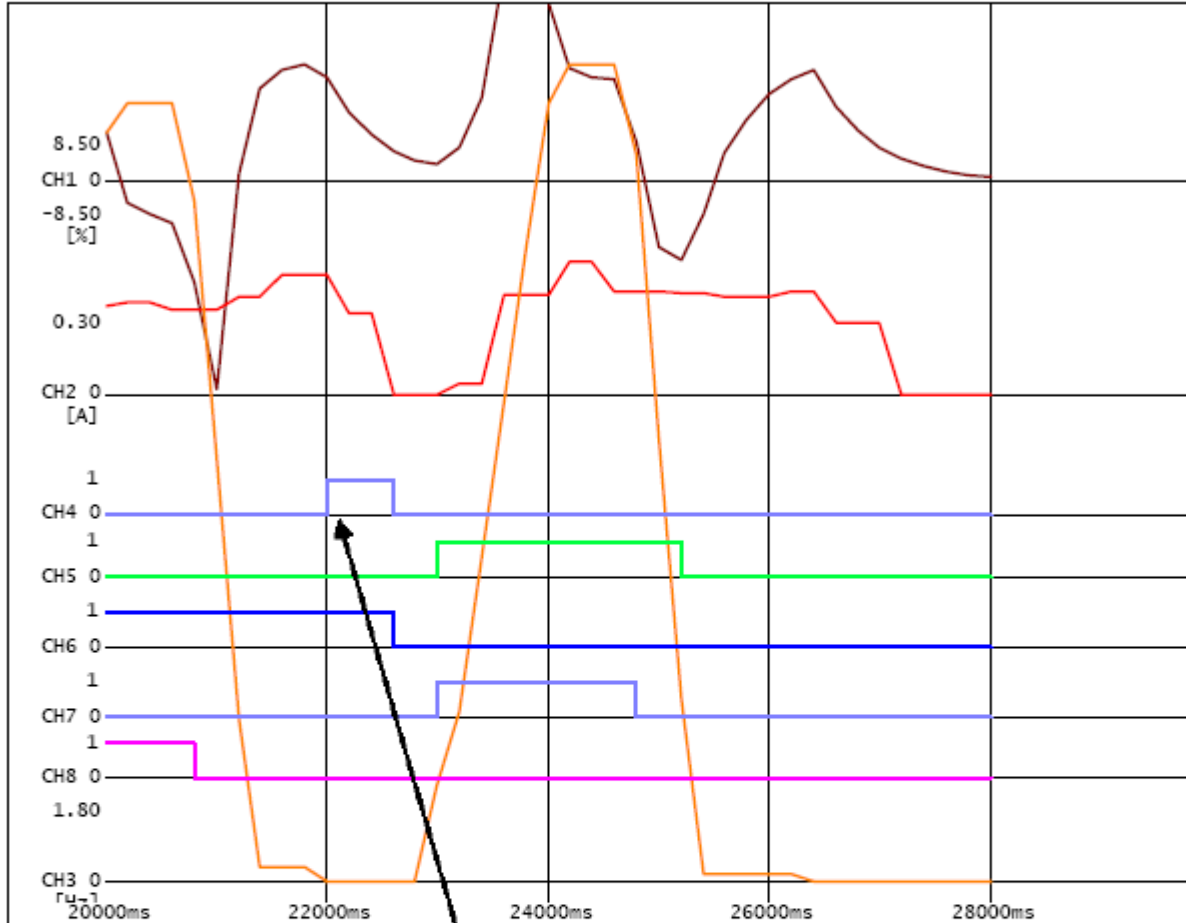
CH1:Output torque:
 CH2:Output current:
 CH3:Output frequency (before slip):
 CH4:30Ry terminal:
 CH5:FWD terminal:
 CH6:REV terminal:
 CH7:X1 terminal:
 CH8:X2 terminal:

Time axis:10000[ms]
 Sampling time:200[ms]

This real time trace is interrupt operation during constant speed(20Hz) of elevator door (CABIN DOOR) along with floor door operation.
HIT & STOP ACTIVATED

Trace 3: Interrupt at low speed

Real time trace
 File name:RMonitor1 final2 with interrupt operation.RTM
 Date:2006/11/09 13:01:19



CH1:Output torque:
 CH2:Output current:
 CH3:Output frequency(before slip):
 CH4:30Ry terminal:
 CH5:FWD terminal:
 CH6:REV terminal:
 CH7:X1 terminal:
 CH8:X2 terminal:

This real time trace is interrupt operation during constant speed(0.4Hz) of elevator door (CABIN DOOR) along with floor door operation. **HIT & STOP ACTIVATED**

Time axis:10000[ms]
 Sampling time:200[ms]