



Figure 8-23. Channel Expansion: CAN SBC

8.4 Device Functional Modes

The TLIN1431x-Q1 has multiple functional modes of operation, Init, pin/SPI Init, normal, standby, sleep, restart and fail-safe. The next sections describe these modes as well as how the device moves between the different modes. [Figure 8-24](#) and [Figure 8-25](#) graphically shows the relationship while [Table 8-4](#) and tables show the state of pins in each control mode. Upon power up, and once $V_{CC} \geq UV_{CC}$ prior to t_{INACT_FS} timing out the device enters an initialization mode (INIT). While in this mode, V_{CC} is ramping, nRST ramps with V_{CC} , all other pins are off except for monitoring the state of the Pin/nCS pin to determine which control method is being implemented. Once the control method is determined, the device follows the pin control or SPI control path of the state diagram.

Table 8-4. Operating PIN Mode

Function	Restart Mode	Sleep Mode	Standby Mode	Normal Mode	Fail-safe Mode	Fast Mode
EN	NA	Low	Low	High	NA	Pulse then high
RXD	High	Floating	Low for a wake event and power up event otherwise high	Mirrors LIN bus	Floating	Mirrors LIN bus
LIN BUS Termination	Weak current pull-up	Weak current pull-up	45 kΩ (typical)	45 kΩ (typical)	Weak current pull-up	45 kΩ (typical)
Vbat Voltage Divider	Off	Off	On	On	Fault dependent	On