BLDC Motherboard pins definition (CN94)

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| Pin No. | Function | Description |
| 1 | GK | If over current or low voltage protection is triggered in gate driver, this pin gives the following:   |  |  | | --- | --- | | VGK |  | | 3.3V | Gate driver work in normal | | 0V | Gate driver in protection | |
| 2 | PWMWH | High-side IGBT voltage level for **W** phase:   |  |  | | --- | --- | | VPWMWH |  | | >2.4V | IGBT on | | <0.7V | IGBT off | |
| 3 | PWMWL | Low-side IGBT voltage level for **W** phase:   |  |  | | --- | --- | | VPWMWL |  | | >2.4V | IGBT on | | <0.7V | IGBT off | |
| 4 | PWMVH | High-side IGBT voltage level for **V** phase:   |  |  | | --- | --- | | VPWMVH |  | | >2.4V | IGBT on | | <0.7V | IGBT off | |
| 5 | PWMVL | Low-side IGBT voltage level for **V** phase:   |  |  | | --- | --- | | VPWMVL |  | | >2.4V | IGBT on | | <0.7V | IGBT off | |
| 6 | PWMUH | High-side IGBT voltage level for **U** phase:   |  |  | | --- | --- | | VPWMUH |  | | >2.4V | IGBT on | | <0.7V | IGBT off | |
| 7 | PWMUL | Low-side IGBT voltage level for **U** phase:   |  |  | | --- | --- | | VPWMUL |  | | >2.4V | IGBT on | | <0.7V | IGBT off | |
| 8 | RSH+ | 1. DC Bus Current feedback detection，Rshunt =0.1Ω   Feedback signal level VRSH+ = 0.1\*IDCBUS  For example:   |  |  | | --- | --- | | RSH+ Voltage VRSH+ | DC BUS current IDCBUS | | 0.2V | 2A |  1. If VRSH+ > 0.88V, the gate driver over current protection (OCP) will be triggered and all PWM pins turn off |
| 9 | HV- | HV- ground pin |
| 10 | +5V | +5V output |
| 11 | +3.3 | +3.3V output |
| 12 | VTH | IGBT temperature detection pin using a thermistor RRTH4 placed near Q901.    The relation between RRTH4 resistance and temperature is as follow：   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Temperature ℃ | 0 | 25 | 50 | 100 | 110 | 120 | | Resistance Ω | 27k | 10k | 4.13k | 0.96k | 0.75k | 0.60k |   RTH4 type: TSM2A103F34D1R (Thinking Electronic) |
| 13 | BRAKE | Shunt braking resistor trigger level.  This function is recommended when DC Bus> 400V.  An external regenerative resistor (300Ω recommended) on CN100 of motherboard is required.   |  |  | | --- | --- | | VBRAKE |  | | >3V | Regenerative resistor off | | <0.5V | Regenerative resistor on | |
| 14 | Eempty pin |  |
| 15 | HV1 | 380V DC Bus voltage detection.  R948 (665kΩ) on motherboard together with another resistor on daughterboard are used as voltage divider for DC Bus (HV+) detection. |

Control daughter board pins definition (CN93)

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| Pin No. | Function | Description |
| 1 | +5V | +5VDC output pin; Max. current 0.2A |
| 2 | Hall detection 1 | Digital Hall IC detection input 1 pin (No needed in case default MCU firmware is used) |
| 3 | Hall detection 3 | Digital Hall IC detection input 3 pin (No needed in case default MCU firmware is used) |
| 4 | Hall detection 2 | Digital Hall IC detection input 2 pin (No needed in case default MCU firmware is used) |
| 5 | GND | Ground pin for Hall IC, speed control and Start/stop |
| 6 | Rotating speed | Input pin for speed control  Forward rotation (0~100%): 5~9.6V  Reverse rotation (0~100%): 5~0.4V |
| 7 | Start/Stop | Input pin for motor start or stop  Start: +5V  Stop: open |
| 8 | Empty pin |  |
| 9 | TXD | RS-232 TX signal |
| 10 | RXD | RS-232 RX signal |