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| **REGISTER**   |  |  |  |  | | --- | --- | --- | --- | | Address | symbol | description | length（Bytes） | | 0X00 | CONFIG\_VALID | write 0 for loading default data  write 1 for saving i2c address  write 0X00F6B6C7 for save all registers data into flash and use these data to init capes.  0X006F6B7C is means config values are valid. | 4 | | 0X04 | CONFIG\_TB\_PWM\_FREQ | PWM frequency is used for TB\_1A~TB\_2B，default value is 1kHz | 4 | | 0X08 | I2C\_ADDRESS | I2C address，default value is 0X4B | 1 | | 0X09 | TB\_1A\_MODE | TB\_1A port work mode | 1 | | 0X0A | TB\_1A\_DIR | TB\_1A port direction | 1 | | 0X0B | TB\_1A\_DUTY | TB\_1A port PWM duty | 2 | | 0X0D | TB\_1A\_SPM\_SPEED | TB\_1A port stepper motor speed，it means how long for 1 step, unit is us. | 4 | | 0X11 | TB\_1A\_SPM\_STEP | TB\_1A port stepper motor steps | 4 | | 0X15 | TB\_1B\_MODE | TB\_1B port work mode,when TB\_1A is stepper motor mode，TB\_1B is invalid，TB\_1B and TB\_1A work together | 1 | | 0X16 | TB\_1B\_DIR | TB\_1B port direction | 1 | | 0X17 | TB\_1B\_DUTY | TB\_1B port PWM duty | 2 | | 0X19 | TB\_1B\_SPM\_SPEED | TB\_1B port stepper motor speed，it means how long for 1 step, unit is us. | 4 | | 0X1D | TB\_1B\_SPM\_STEP | TB\_1B port stepper motor steps | 4 | | 0X21 | TB\_2A\_MODE | TB\_2A port work mode | 1 | | 0X22 | TB\_2A\_DIR | TB\_2A port direction | 1 | | 0X23 | TB\_2A\_DUTY | TB\_2A port PWM duty | 2 | | 0X25 | TB\_2A\_SPM\_SPEED | TB\_2A port stepper motor speed，it means how long for 1 step, unit is us. | 4 | | 0X29 | TB\_2A\_SPM\_STEP | TB\_2A port stepper motor steps | 4 | | 0X2D | TB\_2B\_MODE | TB\_2B port work mode,when TB\_2A is stepper motor mode，TB\_2B is invalid，TB\_2B and TB\_2A work together | 1 | | 0X2E | TB\_2B\_DIR | TB\_2B port direction | 1 | | 0X2F | TB\_2B\_DUTY | TB\_2B port PWM duty | 2 | | 0X31 | TB\_2B\_SPM\_SPEED | TB\_2B port stepper motor speed，it means how long for 1 step, unit is us. | 4 | | 0X35 | TB\_2B\_SPM\_STEP | TB\_2B port stepper motor steps | 4 | | 0X39 | SVM1\_STATE | Servo 1 status | 1 | | 0X3A | SVM1\_FREQ | Servo 1 driving frequency | 2 | | 0X3C | SVM1\_ANGLE | Servo 1 angle | 2 | | 0X3E | SVM2\_STATE | Servo 2 status | 1 | | 0X3F | SVM2\_FREQ | Servo 2 driving frequency | 2 | | 0X41 | SVM2\_ANGLE | Servo 2 angle | 2 | | 0X43 | SVM3\_STATE | Servo 3 status | 1 | | 0X44 | SVM3\_FREQ | Servo 3 driving frequency | 2 | | 0X46 | SVM3\_ANGLE | Servo 3 angle | 2 | | 0X48 | SVM4\_STATE | Servo 4 status | 1 | | 0X49 | SVM4\_FREQ | Servo 4 driving frequency | 2 | | 0X4B | SVM4\_ANGLE | Servo 4 angle | 2 | | 0X4D | SVM5\_STATE | Servo 5 status | 1 | | 0X4E | SVM5\_FREQ | Servo 5 driving frequency | 2 | | 0X50 | SVM5\_ANGLE | Servo 5 angle | 2 | | 0X52 | SVM6\_STATE | Servo 6 status | 1 | | 0X53 | SVM6\_FREQ | Servo 6 driving frequency | 2 | | 0X55 | SVM6\_ANGLE | Servo 6 angle | 2 | | 0X57 | IO1\_STATE | IO1 status | 1 | | 0X58 | IO1\_MODE | IO1 mode | 1 | | 0X59 | IO1\_PUPD | IO1 pull up/pull down status | 1 | | 0X5A | IO1\_PPOD | IO1 push-pull/open drain status | 1 | | 0X5B | IO2\_STATE | IO2 status | 1 | | 0X5C | IO2\_MODE | IO2 mode | 1 | | 0X5D | IO2\_PUPD | IO2 pull up/pull down status | 1 | | 0X5E | IO2\_PPOD | IO2 push-pull/open drain status | 1 | | 0X5F | IO3\_STATE | IO3 status | 1 | | 0X60 | IO3\_MODE | IO3 mode | 1 | | 0X61 | IO3\_PUPD | IO3 pull up/pull down status | 1 | | 0X62 | IO3\_PPOD | IO3 push-pull/open drain status | 1 | | 0X63 | IO4\_STATE | IO4 status | 1 | | 0X64 | IO4\_MODE | IO4 mode | 1 | | 0X65 | IO4\_PUPD | IO4 pull up/pull down status | 1 | | 0X66 | IO4\_PPOD | IO4 push-pull/open drain status | 1 | | 0X67 | IO5\_STATE | IO5 status | 1 | | 0X68 | IO5\_MODE | IO5 mode | 1 | | 0X69 | IO5\_PUPD | IO5 pull up/pull down status | 1 | | 0X6A | IO5\_PPOD | IO5 push-pull/open drain status | 1 | | 0X6B | IO6\_STATE | IO6 status | 1 | | 0X6C | IO6\_MODE | IO6 mode | 1 | | 0X6D | IO6\_PUPD | IO6 pull up/pull down status | 1 | | 0X6E | IO6\_PPOD | IO6 push-pull/open drain status | 1 |  * Default TB port mode is DC motor, default duty 50%, default time for 1 step is 5000us; * Default servo stauts is disable,default driving frequency is 50Hz,default angle is 90°，angleg range is 0~180. Please do not change the servo driving frequency freely.It may lead to a situation that the servo motor can not turn to the valid angle * Defaulr IO input mode，no pull up/down. * IO1 as B11 on board, IO2 as B10 on board, IO3 as A7 on board, IO4 as A6 on board, IO5 as A5 on board, IO6 as A4 on board. * Servo 1~6 PWM output pin are A11,A8,B8,B9,A2,A3 on board. * TB\_1A as Motor2 on board， TB\_1B as Motor1 on board， TB\_2A as Motor4 on board， TB\_2B as Motor3 on board * TB port direction:0- Short Break，1-CW，2-CCW，3-STOP * TB port mode：0-DC motor，1-stepper motor * Servo motor stauts：0-disable，1-enable * IO work mode：0-input，1-output * IO pull up/down mode：0-pull up，1-pull up，2 - none * IO output mode：0- push pull，1-open drain * IO stauts ：0-low，1-high * Servo motor angle：0~180° * TB port PWM duty : 0~1000 as 0%~100%   PWM frequency : 1k~10k  **Communication Protocol：**  **1.read reg**   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | S | I2C address | Read flag 0 | Reg address | Length  (bytes) | start | I2C address | Data1 | data2 | ... | datan | P |  * **Write reg**  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | S | I2C address | Write flag 1 | Reg address | Data1 | data2 | ... | datan | P |   **Default communication frequency is 100k。** |