

6. ????????

6. ????????

6.1 CAN ???ID ???

CAN ID [] []

[]	[]	ID []
[] ID []	[] SDC [] AMS Fault []	0x001-0x0FF
[]	[]	0x100-0x2FF
[]	[]	0x300-0x5FF
[]	[] Log []	0x600-0x7FF

[] CAN [] ID [] ID [] [] Bus
[]

CAN [] AMS [] []

```
CAN ID: 0x050[ ][ ][ ][ ]
DLC: 8 bytes
Byte 0: Status [0x00=OK, 0x01=OV, 0x02=UV, 0x03=OT, 0xFF=Fault]
Byte 1: Max Cell Voltage [LSB = 1 mV] [ ] 8 bits [ ]
Byte 2: Max Cell Voltage [ ] 8 bits [ ]
Byte 3: Min Cell Voltage [ ] 8 bits [ ]
Byte 4: Min Cell Voltage [ ] 8 bits [ ]
Byte 5: Max Temperature [°C, offset -40]
Byte 6: SOC [0-100%]
Byte 7: Fault Code [ ][ ][ ][ ][ ]
```

[] []

- [] 10-50 ms []
- [] 5-10 ms
- [] 50-100 ms
- [] 100-500 ms

6.2 Fail-safe

Fail-safe

CAN

```
// 
void CAN_RxCallback(uint32_t id, uint8_t *data) {
    if (id == MOTOR_CONTROLLER_STATUS_ID) {
        last_mc_heartbeat = get_timestamp();
        update_mc_status(data);
    }
}

void safety_check_task(void) { //  10ms 
    if (get_timestamp() - last_mc_heartbeat > MC_TIMEOUT_MS) {
        // Motor Controller  →  0
        set_torque_command(0);
        set_fault(FAULT_MC_TIMEOUT);
    }
}
```

- AMS 100 ms HV
- Motor Controller 50 ms 0
- 20 ms

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warning	<input type="checkbox"/>	<input type="checkbox"/>
Soft Fault	<input type="checkbox"/>	<input type="checkbox"/> 50%
Hard Fault	<input type="checkbox"/>	<input type="checkbox"/> 0 <input type="checkbox"/> RTD
Critical Fault	<input type="checkbox"/>	<input type="checkbox"/> SDC <input type="checkbox"/>

6.3 State Machine

