Dobot ALARM

Dobot Magician

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Revised History

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Contents

1. ALARM

ALARM, the controller will monitor the system status in all Dobot products. The external software can read or clear the releated alarm status.

The classification of Dobot Magician can be divided into the following items:

Figure 1.1 Alarm Classification

Classification	Description
Public Alarm	Public part,such as reset
Planning Alarm	Caused by calculating error in planning
Kinematic Alarm	Caused by calculating error or limit in the movement process
Overspeed Alarm	Actual overspeed of each Joint
Limit Alarm	Limitation of each Joint

1.1 Public Alarm

1.1.1 Reset Alarm

1. Index: 0x00；
2. Set condition: After the system reset, the reset alarm will be set automatically.
3. Reset condition: Protocol instruction is cleared.

1.1.2 Undifined Instruction

1. Index: 0x01；
2. Set condition: Undifined instruction is received;
3. Reset condition: The protocol instruction is cleared. 。

1.1.3 The File System Error

1. Index: 0x02；
2. Set condition: The file system errors;
3. Reset condition: Reset, if the file system initialization is successful, then reset the alarm automatically.

1.1.4 Failured Communication between MCU and FPGA

1. Index: 0x03；
2. Set condition: The communication between MCU and FPGA is failed when initialization;
3. Reset condition: Reset, if the communication is successful, then reset the alarm automatically.

1.1.5 The Angle Sensor Reading Error

1. Index: 0x04；
2. Set condition: The angle sensor value can not be read correctly;
3. Reset condition: Power off, power on again, if the angle sensor value can be read correctly, then reset alarm.

1.2 Planning Alarm

1.2.1 Inverse Resolve Alarm

1. Index: 0x11；
2. Set condition: The planning target point is not in the robot work space, resulting in the reverse solution error;
3. Reset condition: The protocol instruction is cleared.

1.2.2 Inverse Resolve Limit

1. Index: 0x12；
2. Set condition: Inverse resolve of the target point beyond the joint limit value.
3. Reset condition: The protocol instruction is cleared. 。

1.2.3 Data Repetition

1. Index: 0x13；
2. Set condition: The protocol instruction repetition.
3. Reset condition: The protocol instruction is cleared. 。

1.2.4 Arc Input Parameter Alarm

1. Index: 0x13；
2. Set condition: Enter the midpoint of the arc, and the target point can not form an arc;
3. Reset condition: The protocol instruction is cleared. 。

1.2.5 JUMP Parameter Error

1. Index: 0x15
2. Set condition: The planning starting point or the target point height above the set maximum JUMP height;
3. Reset condition: The protocol instruction is cleared. 。

1.3 Kinematic Alarm

1.3.1 Inverse Resolve Alarm

1. Index: 0x21；

2. Set condition: The movement process beyond the robot work space resulting in the inverse solution error;
3. Reset condition: The protocol instruction is cleared. 。

1.3.2 Inverse Resolve Limit

1. Index: 0x22；
2. Set condition: The inverse solution of the motion exceeds the Joint limit value;
3. Reset condition: The protocol instruction is cleared. 。

1.4 Limit Alarm

1.4.1 Joint 1 Positive Limit Alarm

1. Index: 0x40；
2. Set condition: Joint 1 moves in the positive direction to the limit area;
3. Reset condition: Protocol command reset the alarm manually; reset the alarm in reverse exit limit area automatically.

1.4.2 Joint 1 Negative Limit Alarm

1. Index: 0x41；
2. Set condition: Joint 1 moves in the opposite direction to the limit area;
3. Reset condition: Protocol command reset the alarm manually; reset the alarm in reverse exit limit area automatically.

1.4.3 Joint 2 Positive Limit Alarm

1. Index: 0x42；
2. Set condition: Joint 2 moves in the positive direction to the limit area;
3. Reset condition: Protocol command reset the alarm manually; reset the alarm in reverse exit limit area automatically.

1.4.4 Joint 2 Negative Limit Alarm

1. Index: 0x43；
2. Set condition: Joint 2 moves in the opposite direction to the limit area;
3. Reset condition: Protocol command reset the alarm manually; reset the alarm in reverse exit limit area automatically.

1.4.5 Joint 3 Positive Limit Alarm

1. Index: 0x44；
2. Set condition: Joint 3 moves in the positive direction to the limit area;

3. Reset condition: Protocol command reset the alarm manually; reset the alarm in reverse exit limit area automatically.

1.4.6 Joint 3 Negative Limit Alarm

1. Index: 0x45；
2. Set condition: Joint 3 moves in the opposite direction to the limit area;
3. Reset condition: Protocol command reset the alarm manually; reset the alarm in reverse exit limit area automatically.

1.4.7 Joint 4 Positive Limit Alarm

1. Index: 0x46；
2. Set condition: Joint 4 moves in the positive direction to the limit area;
3. Reset condition: Protocol command reset the alarm manually; reset the alarm in reverse exit limit area automatically.

1.4.8 Joint 4 Negative Limit Alarm

1. Index: 0x47；
2. Set condition: Joint 4 moves in the opposite direction to the limit area;
3. Reset condition: Protocol command reset the alarm manually; reset the alarm in reverse exit limit area automatically.

1.4.9 Parallegram Positive Limit Alarm

1. Index: 0x48；
2. Set condition: The parallelogram stretching movement reaches the deformation limit position;
3. Reset condition: Protocol command reset the alarm manually; reset the alarm in contract exit limit area automatically.

1.4.10 Parallegram Negative Limit Alarm

1. Index: 0x49；
2. Set condition: The parallelogram stretching movement reaches the deformation limit position;
3. Reset condition: Protocol command reset the alarm manually; reset the alarm in contract exit limit area automatically.

2. ALARM Implementation

In the implementation of Dobot Magician:

- All ALARM states exist in an array;
- Each ALARM occupies 1 bit;
- Each byte in the array can identify the alarm status of 8 alarm items, and ALARM index of small alarm items in the low, ALARM index of the alarm items in the high level.

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