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Produced by : - CTC  
Travellers Lane, Hatfield, Herts, AL10 8XB, UK  
Author: Matt Wills

## ***Databank - Technical Bulletin***

**This Data Sheet details commonly used useful internal Devices for the Mitsubishi Motion Controllers.**

**The applicable controllers are:**

**Q172, Q172H and Q172D  
Q173, Q173H and Q173D  
MR-MQ100  
Q170M**

### **Internal Relays:**

**Note: The Detailed flag is always for Axis 1, for axis 2 add the index value to axis 1's flag, example:**

**M2402 (+20n) = M2402 for axis 1, M2422 for axis 2, M2442 for axis 3 →**

### **Axis Status Flags:**

#### **In-Position Signal – M2402 (+20n)**

This signal turns on when the number of droop pulses in the deviation counter becomes less than the 'In Position Range' set in the Servo Parameters. Useful for indicating when an axis is in the requested position.

#### **Zero Pass Signal – M2406 (+20n)**

This signal turns on when the zero point (Z phase of the servo motor encoder) is passed. Useful for OPR routines on a rotary application where only motor shaft orientation is required as the an SFC can be written to jog the servo motor until the Z Phase is reached.

#### **Error Detection Signal – M2407 (+20n)**

Turns on when either a Minor or Major error is detected. The Error code is then stored in either the Minor Error register (D6+20n) or the Major Error Register (D7+20n).

Minor errors can be cleared using M3207+20n, Major errors are also reset using M3207+20n

#### **Servo Error Detection – M2408 (+20n)**

This signal turns on when an error occurs with the servo amplifier. Resets with M3208+20n

#### **Home Position Return Complete – M2410 (+20n)**

This signal turns on when an OPR has been successfully executed.

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### **FLS Signal – M2411 (+20n)**

Forward Limit Switch. This signal shows the status of the Forward Limit Switch, either wired into the servo amplifier (J3 only) or the LX Card/IO. The FLS switch should be Normally Closed, therefore when the limit switch input is OFF the FLS Signal is ON.

### **RLS Signal – M2412 (+20n)**

Reverse Limit Switch. This signal shows the status of the Reverse Limit Switch, either wired into the servo amplifier (J3 only) or the LX Card/IO. The RLS switch should be Normally Closed, therefore when the limit switch input is OFF the RLS Signal is ON

### **Servo Ready Signal – M2415 (+20n)**

Turns ON when the servo Amplifiers connected to each axis are in READY state.

### **Axis Command Flags:**

#### **Forward Rotation JOG Start Command – M3202 (+20n)**

Start the axis JOG operation in the direction of an increase in address

#### **Reverse Rotation JOG Start Command – M3203 (+20n)**

Start the axis JOG operation in the direction of a decrease in address

#### **Error Reset Command – M3207 (+20n)**

Used to reset both Minor and Major Errors.

#### **Servo Error Reset Command – M3208 (+20n)**

Used to reset the Servo amplifiers following an error

#### **Servo OFF Command - M3215 (+20n)**

Used to turn off power to the servo motor, therefore removing Servo Lock. Useful for turning off individual Axis.

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### **Common Devices:**

#### **PLC Ready Flag – M2000**

This signal informs the Motion CPU that the PLC CPU is normal.  
The setting data such as the fixed parameters, servo parameters and limit switch output data can be changed using a peripheral device when the M2000 is OFF only.

#### **Start Accept Flag – M2001 to M2032**

This flag turns on when the servo program is started. The start accept flag corresponding to an axis specified with the servo program turns on.

#### **Motion SFC Error Detect - M2039**

This flag turns on with error occurrence at the execution of the Motion SFC program.

#### **All Axis Servo ON command - M2040**

This command is used to enable servo operation

#### **All Axis Servo ON Accept Flag - M2049**

This flag turns on when the Motion CPU accepts the all axes servo ON command (M2042).

### **Data Registers**

Some registers are 32bit and therefore occupy 2 data registers. These are specified when you see 2 Data registers for the same device separate by a comma:

D0+20n, D1+20n is a 32 bit device occupying D0 and D1 for Axis 1, and then D20 and D21 for Axis 2 etc.

### **Axis Monitor Devices:**

#### **Feed Value Current Storage Register – D0+20n, D1+20n**

This register stores the target address output to the servo amplifier on the basis of the positioning address/travel value specified with the servo program.

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### Real Value Current Storage Register – D2+20n, D3+20n

This register stores the real current value which took the droop pulses of the servo amplifier into consideration to the feed current value. The "feed current value" is equal to the "real current value" in the stopped state.

### Minor Error Code – D6+20n

This register stores the corresponding error code at the minor error occurrence. If another minor error occurs after error code is stored, the previous error code is overwritten by the new error code. Minor error codes can be cleared by an error reset command **M3207+20n**

### Major Error Code – D7+20n

This register stores the corresponding error code at the major error occurrence. If another major error occurs after error code is stored, the previous error code is overwritten by the new error code. Major error codes can be cleared by an error reset command **M3207+20n**

### Servo Error Code – D8+20n

This register stores the corresponding error code at the servo error occurrence. If another servo error occurs after error code is stored, the previous error code is overwritten by the new error code. Servo error codes can be cleared by an error reset command **M3208+20n**

### Axis Command Registers:

### Jog Speed Register – D640+2n, D641+2n

Set the desired Jog Speed here.

### Real Mode Axis Information Register – D790, D791

This signal is used to store the information used as a real mode axis at the time of switching from real mode to virtual mode:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
D790	Axis 16	Axis 15	Axis 14	Axis 13	Axis 12	Axis 11	Axis 10	Axis 9	Axis 8	Axis 7	Axis 6	Axis 5	Axis 4	Axis 3	Axis 2	Axis 1
D791	Axis 32	Axis 31	Axis 30	Axis 29	Axis 28	Axis 27	Axis 26	Axis 25	Axis 24	Axis 23	Axis 22	Axis 21	Axis 20	Axis 19	Axis 18	Axis 17

- ▶ Real mode axis information
- 0 : Real mode axis
- 1 : Except real mode axis