

『Maple Bus 1.0』Peripheral Hardware Specifications

Dreamcast Mouse

Rev 0.80

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1 Overview

This describes the Dreamcast Mouse peripheral for Dreamcast.

1.1 Dreamcast Mouse definitions

It conforms to the "Maple Bus 1.0" Standard Specifications and belongs to Function Type "FT₉:Pointing Function".

Dreamcast Mouse is classified with category code 0h as specified by FT₉.

For details, refer to the "FT₉:Pointing Function" specification.

1.2 Function elements

The Dreamcast Mouse provides the following functions from among those defined in the "FT₉:Pointing Function" mouse category:

- Category code : Mouse
- Press buttons : A,B,W
- Analog coordinate axes : AC1,AC2 (ball)
AC3 (wheel)
- Option parameters : None

1.3 Configuration Details

Each of the Dreamcast Mouse function elements is describe in detail in the following.

■ Category code '0h' (mouse)

(1) Operation buttons:A,B,W

These are 2-value press/release (= ON/OFF) digital type keys (buttons).

The controller must be able to detect whether multiple keys (buttons) are ON at the same time.

A button : left button The values are: press = '0', release = '1'.

B button : right button The values are: press = '0', release = '1'.

W button : wheel (center) button The values are: press wheel = '0', release = '1'.

(2) Ball : AC1(X),AC2(Y)

Relative coordinates in both axes are detected by an optical converter.

Coordinate accuracy is 10 bits.

(3) Wheel : AC3(Z)

Relative coordinate is detected by an optical converter.

Coordinate accuracy is 10 bits.

2 Dreamcast Mouse Function Operation and Limitations

The following describes the Dreamcast Mouse operation.

2.1 Operation

This conforms to "FT₉:Pointing Function" operation in the mouse category.

(1) Ball and wheel

The ball in the Dreamcast Mouse detects the X and Y values, and the wheel detects the Z value, and these are output as analog variation amounts. There are three data values (X, Y, Z), and these are represented as 10-bit values.

(2) Overflow

If the relative positional value exceeds 10 bits, for the corresponding axis, AOV_x : coordinate overflow is set to 1.

(3) Access timing

Access at regular intervals is recommended.

The Dreamcast Mouse outputs the change (relative coordinates) from the previous access.

(4) Optimization, conditions

a) The simultaneous ON statuses of operation buttons must detectable.

b) When two or more buttons are simultaneously pressed, buttons that are not pressed must not come ON (key data must not be generated).

2.2 Default Configuration

The following describes the Dreamcast Mouse default configuration.

(1) The coordinate position is the origin.

(2) There are no option parameters.

(3) The operating buttons are returned in their state at the time.

3 Device ID

In accordance with the device ID definition in the “Maple Bus 1.0” Standard Specifications.

The notation is that of the host’s memory image.

3.1 Configuration of the device ID

The device ID of the Dreamcast Mouse is configured as shown in the following diagram.

bit	7	6	5	4	3	2	1	0
1st Data	0	0	0	0	0	0	0	0
2nd Data	0	0	0	0	0	0	0	0
3rd Data	0	0	0	0	0	0	1	0
4th Data	0	0	0	0	0	0	0	0
5th Data	0	0	0	0	0	0	0	0
6th Data	0	0	0	0	1	1	1	0
7th Data	0	0	0	0	0	1	1	1
8th Data	0	0	0	0	0	0	0	0
9th Data	0	0	0	0	0	0	0	0
10th Data	0	0	0	0	0	0	0	0
11th Data	0	0	0	0	0	0	0	0
12th Data	0	0	0	0	0	0	0	0
13th Data	0	0	0	0	0	0	0	0
14th Data	0	0	0	0	0	0	0	0
15th Data	0	0	0	0	0	0	0	0
16th Data	0	0	0	0	0	0	0	0

Fig. 3.1 Device IDs for the Dreamcast Mouse

FT : Designates type of function that the peripheral is equipped with.

FD1 : 1st function definition block.

FD2 : 2nd function definition block.

FD3 : 3rd function definition block.

(1) $FT_{31} \sim FT_0$: Function type

Designates the function that the peripheral is equipped with.

There are 32 function types altogether.

(2) $FD_{31} \sim FD_0$: Function definition block

This is for the block defining the individual elements making up the function.

(A single peripheral device may include three different functions.)

4 Data Formats

This chapter describes the Dreamcast Mouse data formats.

4.1 Dreamcast Mouse data formats

This complies with the data format for the mouse category.

bit	7	6	5	4	3	2	1	0
1st-Data	1	1	1	1	W	A	B	1
2nd-Data	0	0	0	0	0	0	0	0
3th-Data	0	0	0	0	0	AOV ₂	AOV ₁	AOV ₀
4rd-Data	0	0	0	0	0	0	0	0
5th-Data	AC1 ₇	AC1 ₆	AC1 ₅	AC1 ₄	AC1 ₃	AC1 ₂	AC1 ₁	AC1 ₀
6th-Data	0	0	0	0	0	0	AC1 ₉	AC1 ₈
7th-Data	AC2 ₇	AC2 ₆	AC2 ₅	AC2 ₄	AC2 ₃	AC2 ₂	AC2 ₁	AC2 ₀
8th-Data	0	0	0	0	0	0	AC2 ₉	AC2 ₈
9th-Data	AC3 ₇	AC3 ₆	AC3 ₅	AC3 ₄	AC3 ₃	AC3 ₂	AC3 ₁	AC3 ₀
10th-Data	0	0	0	0	0	0	AC3 ₉	AC3 ₈
11th-Data	0	0	0	0	0	0	0	0
12th-Data	0	0	0	0	0	0	1	0
13th-Data	0	0	0	0	0	0	0	0
14th-Data	0	0	0	0	0	0	1	0
15th-Data	0	0	0	0	0	0	0	0
16th-Data	0	0	0	0	0	0	1	0
17th-Data	0	0	0	0	0	0	0	0
18th-Data	0	0	0	0	0	0	1	0
19th-Data	0	0	0	0	0	0	0	0
20th-Data	0	0	0	0	0	0	1	0

Fig. 4.1 Data Formats

■ Description

1st-Data	:BTN	Operating button data
2nd-Data	:OP	Option parameters (00h)
3rd-Data	:AOV	Analog coordinate overflow
4th-Data	:RES	Reserved (00h)
5th~6th-Data	:AC1	X-axis analog coordinate region
7th~8th-Data	:AC2	Y-axis analog coordinate region
9th~10th-Data	:AC3	Z-axis analog coordinate region (wheel)
11th~20th-Data	:AC4~8	Constant (00h-02h, fixed)

4.2 Notes on 10-bit accuracy coordinate values

The coordinate values are split into the top 2 bits and the bottom 8 bits.

The data values are stored as follows, in little-endian format.

Bit	9	8	7	6	5	4	3	2	1	0
10-bit data	D ₉	D ₈	D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀

↓

Data formats	Bit	7	6	5	4	3	2	1	0
n th-Data	Bottom 8 bits	D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
(n+1) th-Data	Top 2 bits	0	0	0	0	0	0	D ₉	D ₈

n:odd

Fig. 4.2 Storing 10-bit accuracy coordinate values

5 Dreamcast Mouse Information

This chapter describes device-specific information.

5.1 Types

Fixed Device Status

This is a set form of device status, consisting of 112 bytes in all, that must be designated.

Free Device Status

The individual devices can use this status freely. It consists of 40 bytes.

5.1.1 Fixed Device Status

The following information is recorded in the Fixed Device Status.

(1) Device ID

Capacity	: 16byte	
Description	: Function type "FT ₉ "	
	Function definition 1st	Three operating buttons, three analog coordinate axes No option parameters
	Function definition 2nd	None
	Function definition 3rd	None
Data	: 00h-00h-02h-00h -00h-0Eh-07h-00h -00h-00h-00h-00h -00h-00h-00h-00h	

(2) Destination

Capacity	:1byte
Description	: Worldwide
Data	: FFh

(3) Connection direction

Size	: 1byte	
Description	: Expansion device	None
Data	: 00h	

(4) Product name

Size	: 30byte
Description	: " Dreamcast Mouse " in hankaku characters. A space code (20h) is inserted for unused space.

(5) License

Size : 60bytes

Description : Generally, it designates

"Produced By or Under License From SEGA ENTERPRISES,LTD."

A space code (20h) is inserted for unused space.

(6) Standby current consumption

Size : 2 bytes

Description : 40.0mA

Data : 01h-90h

(7) Maximum current consumption

Size : 2 bytes

Description : 50.0mA

Data : 01h-F4h

5.1.2 Free Device Status

The host obtains this status by the All Device Request.

The following 40 bytes of data are recorded in this status.

In the Fishing Controller, the following 40 bytes of data are recorded for the device:

"Version 1.000, 2000/02/25, 315-6211-AT , "

"3 Button & X-Y Ball & Z Wheel , 400dpi "

6 Afterword

Until the official version (Rev. 1.0) is distributed, contents will be modified to a small or large extent.