

# 『Maple Bus 1.0』Peripheral Hardware Specifications

## Densya de Go!! Controller

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## 1. Densya de Go!! Controller Configuration

### 1.1 Densya de Go!! Controller definitions

Indicates the man-machine-interface of the input form.

It conforms to the "Maple Bus 1.0" Standard Specifications and belongs to Function Type " FT<sub>0</sub>:Controller ".

This is a dedicated controller for the "Densya de Go!!" software.

### 1.2 Function elements

The Densya de Go!! Controller provides the following functions:

The Densya de Go!! Controller provides the following functions from among those defined in "Device: "FT<sub>0</sub>:Controller":

- Digital arrow keys : Ra,La,Da,Ua
- Digital buttons : A,B,C,D,X,Y,Z,Start
- Analog key : Xa,Ya,Xb,Yb
- Analog lever : R,L

### 1.3 Configuration details

Each of the Densya de Go!! Controller function elements is described in detail in the following.

#### (1) Digital arrow keys : Ra,La,Da,Ua

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

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

Ra,La,Da,Ua are used together, corresponding to the brake lever.

Ra	La	Da	Ua	Brake
0	0	0	1	1h
0	0	1	0	2h
0	0	1	1	3h
0	1	0	0	4h
0	1	0	1	5h
0	1	1	0	6h
0	1	1	1	7h
1	0	0	0	8h

Ra	La	Da	Ua	Brake
1	0	0	1	9h
1	0	1	0	Ah
1	0	1	1	Bh
1	1	0	0	Ch
1	1	0	1	Dh
1	1	1	0	Eh
1	1	1	1	Fh

Fig. 0.1 Brake lever

At the instant of switching Ra, La, Da, and Ua, the values are 0, 0, 0, 0.

## (2) Digital buttons: A,B,C,D,X,Y,Z,Start

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

Simultaneous ON for multiple keys (buttons) must be detectable.

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

The Start button is a start button, and the D button corresponds to the Select button.

The A, B, and C buttons correspond to the A, B, and C buttons.

The X, Y, and Z buttons are used together, and correspond to the master control.

X	Y	Z	Master Control
1	1	0	5h
1	0	1	4h
1	0	0	3h
0	1	1	2h
0	0	1	1h
0	0	0	Off

Fig. 0.2 Master Control

At the instant of switching X, Y, and Z, the values are 1, 1, 1.

## (3) Analog key : A3,A4,A5,A6

The analog key produces a value that changes linearly with the amount of movement from the initial position. The initial position is taken as 80h. The value range is 00h (minimum) to FFh (maximum), in 01h units.

A3 and A4 are 00h, and A5 and A6 are FFh. These values are fixed.

## (4) Analog lever : A1,A2

The analog lever produces a value that changes linearly with the amount of movement from the initial position.

The initial position is taken as 00h. The value range is 00h (minimum) to FFh (maximum), in 01h units.

A1 and A2 are FFh. These values are fixed.

## 2 Densya de Go!! Controller Function Operation and Limitation

The Densya de Go!! controller function conforms to "FT<sub>0</sub>: Controller Function" operation.

### (1) Key scan

The key data for the digital keys (buttons) is constantly updated.

Also, to a request for data from the host, a timely response is always possible.

There is no priority sequence in the key scan, and all keys (buttons) can be read simultaneously.

### (2) Optimization, conditions

a) The stick (digital direction keys) has at least three directions ON simultaneously.

b) The digital buttons allow multiple buttons being ON to be detected.

c) When two or more keys (buttons) are pressed simultaneously, this does not cause other keys (buttons) which were not pressed to go ON.

(Key data is not be composited.)

d) There is a chattering cancellation function.

e) The digital direction keys are optimized for the brake lever, and the digital buttons (X, Y, Z) for master control.

However, on the boundaries between switches in the switchover lever, discontinuous values are generated.

(For the brake lever, Ra, La, Da, and Ua =0, 0, 0, and 0; for the master control, X, Y, Z =1, 1, 1.)

In this case, the application software must cancel these values.

f) The analog values are fixed, with A1, A2, A5, and A6 as FFh and A3 and A4 as 00h.

However, since these are analog values, it is recommended to allow some latitude when reading the values.

### 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 Densya de Go!! Controller device ID

The device ID consists of 16 bytes (128 bits).

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	0	0
4th Data	0	0	0	0	0	0	0	1
5th Data	0	0	0	0	0	0	0	0
6th Data	0	0	1	1	1	1	1	1
7th Data	0	0	0	0	1	1	1	1
8th Data	1	1	1	1	1	1	1	1
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 Densya de Go!! controller

- 1st Data～4th Data : Designates type of function that the peripheral is equipped with.(FT)
- 5th Data～8th Data : Function definition block for 1st function (FD1)
- 9th Data～12th Data : Function definition block for 2nd function (FD2)
- 13th Data～16th Data : Function definition block for 3rd function (FD3)

FT=00h-00h-00h-01h

FD1=00h-3Fh-0Fh-FFh

FD2=00h-00h-00h-00h

FD3=00h-00h-00h-00h

## 4 Data Formats

This chapter describes the Densya de Go!! Controller data formats.

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

### 4.1 Read format

The size of the data format is 8 bytes.

The command uses Get Condition.

Bit	7	6	5	4	3	2	1	0
1st Data	Ra	La	Da	Ua	Start	A	B	C
2nd Data	1	1	1	1	D	X	Y	Z
3rd Data	1	1	1	1	1	1	1	1
4th Data	1	1	1	1	1	1	1	1
5th Data	0	0	0	0	0	0	0	0
6th Data	0	0	0	0	0	0	0	0
7th Data	1	1	1	1	1	1	1	1
8th Data	1	1	1	1	1	1	1	1

Fig. 4.1 Read formats

Description of key data

1st : Digital button data. (ON='0', OFF='1')

Ra, La, Da, and Ua control the brake lever.

2nd: Digital button data. (ON='0', OFF='1')

X,Y,Z provide master control.

3rd: Analog axis 1 (A1) data. Fixed at FFh.

4th: Analog axis 2 (A2) data. Fixed at FFh.

5th: Analog axis 3 (A3) data. Fixed at 00h.

6th: Analog axis 4 (A4) data. Fixed at 00h.

7th: Analog axis 5 (A5) data. Fixed at FFh.

8th: Analog axis 6 (A6) data. Fixed at FFh.

It is recommended to allow some latitude when reading the analog values.



## 5 Densya de Go!! Controller Information

This chapter describes device-specific information (device status).

### 5.1 Types

The following types of device status are described.

#### 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.

### 5.2 Fixed device status

The following information is recorded in the Fixed Device Status.

#### (1) Device ID

Capacity	: 16byte
Description	: Function type "FT <sub>0</sub> " only
Function definition 1st	Ra, La, Da, and Ua ,S,A,B,C,D,X,Y,Z,A1,A2,A3,A4,A5,A6
Function definition 2nd	None
Function definition 3rd	None
Data	: 00h-00h-00h-01h -00h-3Fh-0Fh-FFh -00h-00h-00h-00h -00h-00h-00h-00h

#### (2) Destination

Capacity	: 1byte
Description	: Worldwide
Data	: FFh

#### (3) Connection direction

Size	: 1byte
Description	: Expansion device upstream connection
Data	: 00h

#### (4) Product name

Size	: 30 bytes
Description	: " TAITO 001 Controller " 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 : 22mA

Data : 00h-DCh

(7) Maximum current consumption

Size : 2byte

Description : 50mA

Data : 01h-F4h

### 5.3 Free device status

The host obtains this status by the All Device Request.

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

Version 1.000,1999/08/04,315-6211-AR , Controller Compatible & Special A/D"

## **6 Afterword**

This product is manufactured by Taito.