SUZOHAPP

Snapshot LCD Button Technical Manual V1.0.0

Snapshot LCD Button Product Manual

LCD Button Assembly Part No. **130-XXXXXXX**
Controller Board Part No. **130-0010**

InteractivePro

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1 Introduction

The LCD Button unit is a new and innovative addition to the Suzo-Happ range for gaming devices, giving the game designer additional tools to enhance the content and player appeal of new gaming machine concepts.

1.1 Features:

- LCD is integrated into the button and moves with lens cap
- Integrated seal protects button LCD circuitry from liquid spills
- Communications: Serial Peripheral Interface Bus
- Button halo provides illumination to the button casing, this can be dimmed via software
- Button halo available in a range of colors
- Option to customize LCD decal surround (Black chrome standard)
- 24 frames per second animation
- Full Color
- 128 x 128 pixels
- USB interface, controller board controls up to 16 buttons.
- The buttons display images based on commands initiated by the host
- RoHS Compliant

1.2 Advantages:

- Economical alternative to OLED Buttons
- Individual Buttons allow your choice of placement
- If replacement required, you don't have to replace complete button deck, just the button
- No more printed legends, allows for simple game changes or multi game/multi denomination games
- Display text or video to enhance game play or multi-function selection

2 Electro Static Discharge (ESD) Precautions

Electro Static Discharge (ESD) can easily damage the Printed Circuit Boards (PCB's) and semiconductor-based components within the TTU.

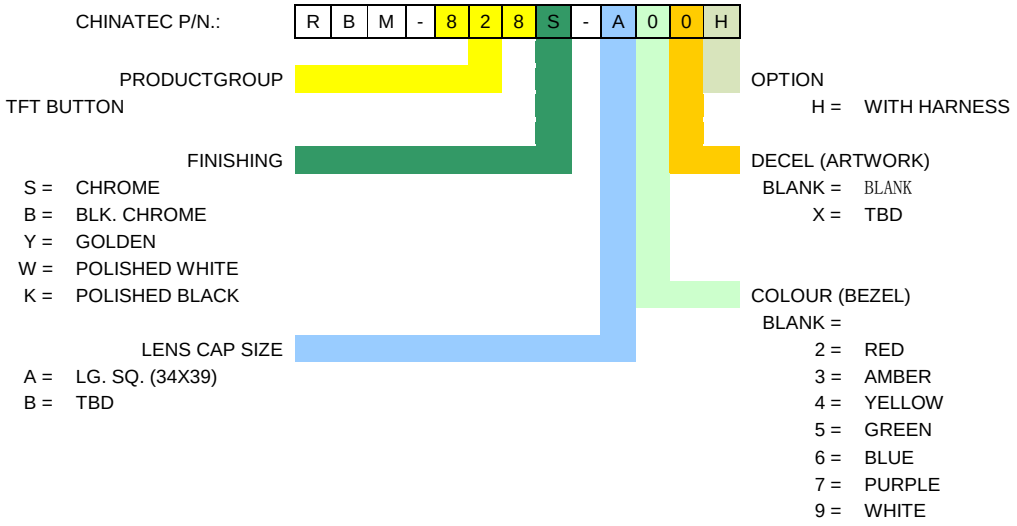
To prevent damaging these sensitive components, the following precautions must be followed when handling them:

- Technicians must wear wrist straps that are properly grounded when handling these devices
- Static sensitive parts must be shipped in silver anti-static bags
- Bench top work surfaces where sensitive parts are worked on must be covered with an anti-static material that dissipates electrostatic charge with that material being grounded.

3 Physical Specifications

3.1 Button Part Number Coding

- **LCDPANEL BUTTON PART NUMBER CODING SYSTEM**

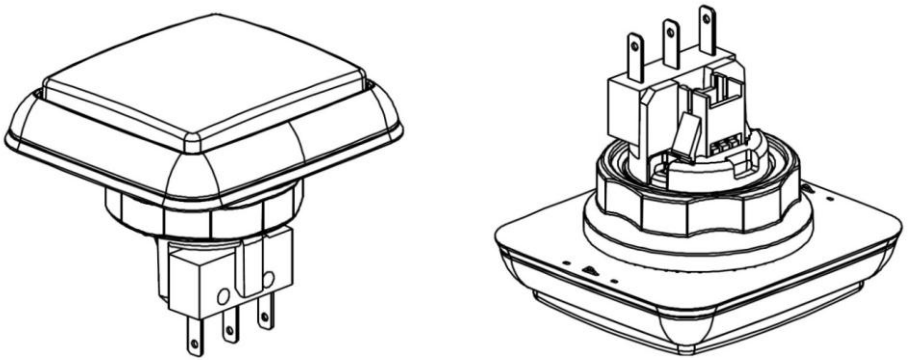


3.2 Mechanical Dimensions

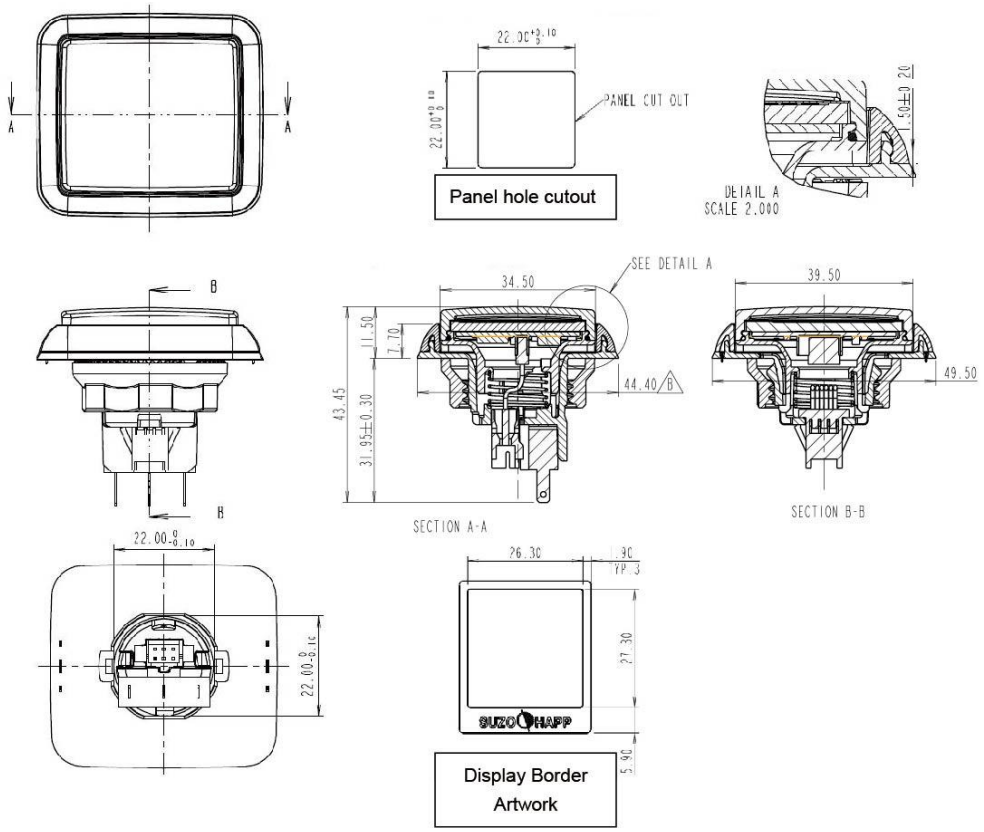
Button Mechanical Dimensions for Reference Only:

Button Bezel Size with Light Ring:	49.5mm x 44.4mm
Lens Cap size:	38.40mm X 33.40mm
Viewing area of LCD:	27.30mm x 26.30mm
Height above panel to top of Lens Cap:	11.5mm
Height below the button panel to the bottom of switch terminals:	32mm
Panel Cut out size for each button:	22mm x 22mm

3.3 LCD Panel Button Part No.: RBM-828S-A-XX

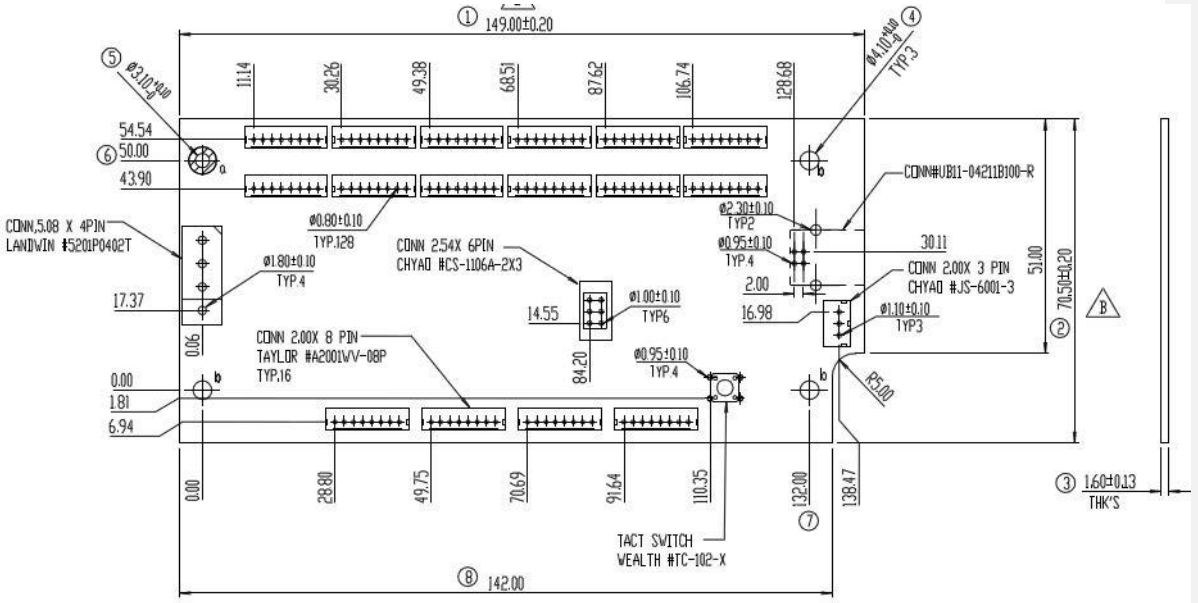


3.4 LCD Panel Button Drawing Measurements



3.5 PCB Drawing Measurements

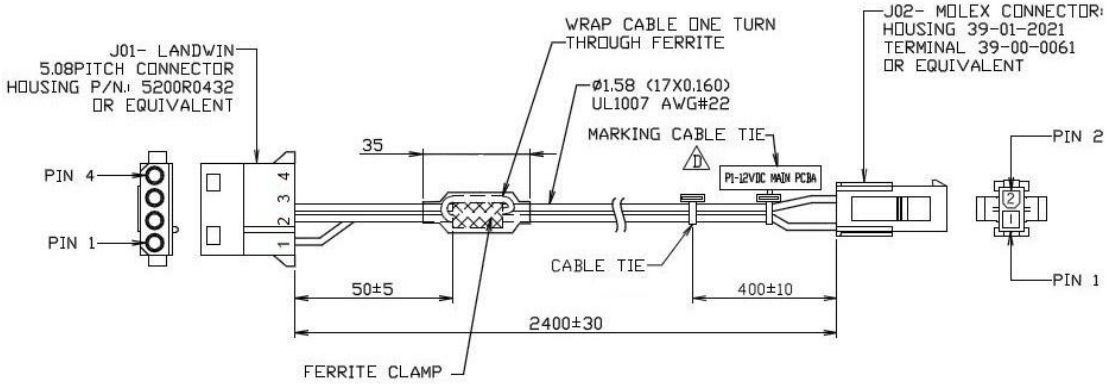
Controller PCB Part No.: RS828-E02-01



3.6 Cabling measurements and pin outs

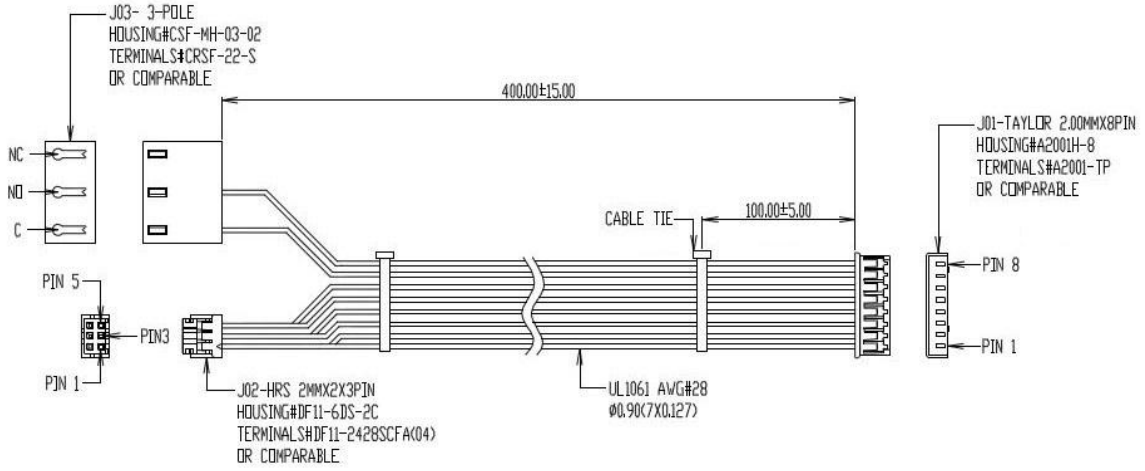
Note: This are standard cable lengths, cable length will be manufactured to customer's requirements

Power Loom: P/N: RS754-E07-00



J01-PIN No.:	1	2	3	4
J02-PIN No.:	2	1	1	N/A
WIRE COLOUR:	RD	YE/GN	YE/GN	N/A

Switch Loom Part No.: RE078-828-03



J01 Pin No.:	1	2	3	4	5	6	7	8
J02 Pin No.:	1	3	2	4	5	6	N/A	N/A
J03 Pin No.:	N/A	N/A	N/A	N/A	N/A	N/A	C	N/A
COLOUR	RD	BR	OR	YE	GN	BK	BK	PL
FUNCTION	V5.0	SPI-MOSI	SPI-MISO	SPI-CLK	SPI-SS	TFT-GND	SW-GND	SW-SIGNAL

4 Material Specifications

Button Plastic

• Push button Lens Cover	Polycarbonate
Rockwell Hardness. Method: ASTM D785	M-Scale = 70 R-Scale = 118
• Button Housing	ABS

Compliance:

• Bezel and Lens Cap:	UL 94 V-0
• Micro Switch	UL 94 V-0
• RoHS Compliance:	Yes

5 Electronic Specifications

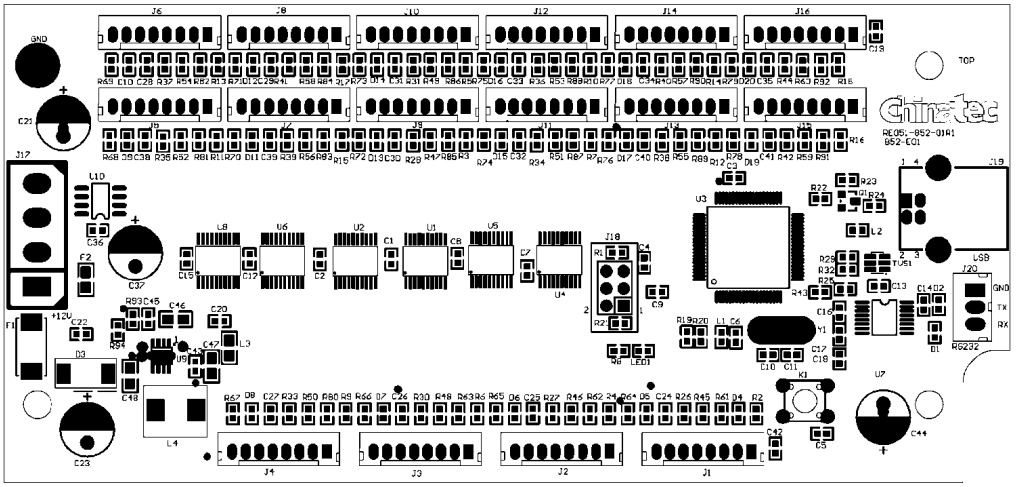
5.1 Overall Electrical Specifications:

Controller PCB:	12VDC
Controller board can drive:	1 to 16 Buttons
Recommend Power Supply for 16 button panel:	12Vdc 2A
Current Average	12VDC 0.8A
Compliance	RoHS Compliant

5.2 Control Board Specifications

Controller PCB. Max. current, (no buttons)	60mA
Current per button. Max:	48mA draw per button
USB Current Max:	1mA
Connector type for RS232 (J20)	2.50X 3 PIN #A2501WV-3P(TAYLOR)
Connection interface	USB 2.0 Type-B Right Angle
Connector type for 12V Power (J17)	5.08 X 4 PIN #5201P0402T (LANDWIN) 5.08 X 4 PIN # C5081WV-4P(CJT)

5.3 Control Board Layout



5.4 Micro Switch Specifications

High quality DB5 Cherry switch

Electrical Ratings and Operating Life			
Switch Series	According to EN61058-1	According to UL1054	Mechanical Life
	Nominal Load	Nominal Load	
DB5	1A 250 VAC	1A 125-250 VAC	1.5 x 10,000,000

5.5 PC Demo Program

- Operating system: Win 2000 / Win XP / Win 7/ Win 8.1 -32bit /64bit
- Max letter size: 128 x 128
- Fonts accepted: Any fonts available on control PC.
- Image format: JEPG / BMP / GIF
- Image format for animation: GIF
- Size of image: any – will be stretched to 128 x 128 automatically.

6 LCD Specifications

6.1 General Specifications

Item	Contents	Unit	Note
LCD Type	TFT	-	
Display color	262K		1
Viewing Direction	6:00	O' Clock	
Active Area(W×H)	25.5 (H) X 26.5(V) mm	mm	
Number of Dots	128(H) X 128(V)Dots X 3(RGB)	mm	
Dot Pitch(W×H)	0.199 X 0.207	mm	
Controller	RM68116	-	
VDD	2.8V	V	
Outline Dimensions	29.8(W) X 34.6 (H) X 2.2(D)	mm	
Backlight	LED(white)	-	
Operating Temperature	-20～+70℃	-	
Storage Temperature	-30～+80℃	-	
Polarizer Mode	Transmit /Negative	-	

Note1: Color tune is slightly changed by temperature and driving voltage

6.2 LCD Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Remark
Analog power supply	V_{CI}	-0.3	+4.6	V	
Logic input voltage	V_{DD}	-0.3	+4.6	V	
Operating temperature (Ambient)	T_{opr}	-20	+60	℃	
Storage temperature (Ambient)	T_{stg}	-30	+70	℃	

Note 1: If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also, if the module operates with the absolute maximum ratings for a long time, the reliability may drop.

Note 2: All the measurements should be operated with driver IC and experimental FPC mounted.

Electrical characteristics (Ta=25℃)

6.3 LCD Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Response time (with polarizer)	Rise	Tr	θ =0°	-	20	35	ms
	Fall	Tf		-	15	30	ms
Contrast ratio (with polarizer)		CR	At optimized Viewing angle	150	300	-	
Viewing angle (with polarizer)	Top		CR≧10	40	60	-	degree
	Bottom			10	20	-	
	Left			25	35	-	
	Right			25	35	-	
Transmittance (without polarizer)		Tm		17	17.6	-	
NTSC coverage		N			60%		
Color Filter coordination		Rx	θ =0°	0.56	0.60	0.64	
		Ry		0.28	0.32	0.36	
		Gx		0.27	0.31	0.35	
		Gy		0.57	0.61	0.65	
		Bx		0.11	0.15	0.19	
		By		0.04	0.08	0.12	
		Wx		0.26	0.30	0.34	
		Wy		0.27	0.31	0.35	

6.4 LCD Reliability

No.	Test Item	Test condition	Criterion
1	High Temperature Storage	80℃±2℃ 96HRestore 4H at 25℃	1. After testing, cosmetic effects should not happen. 2. Total current consumption should not be over 10% of initial value.
2	Low Temperature Storage	-30℃± 2℃ 96H Restore4H at 25℃	
3	High Temperature Operation	70℃± 2℃ 48H Restore 4H at 25℃	
4	Low Temperature	-20℃± 2℃ 48H Restore4H at 25℃	
5	High Temperature /Humidity Storage	40℃± 2℃ 90%RH 48H	
6	Temperature Cycle	-30℃ ←→ 25℃ ←→ 80℃ 5min ~ 30min←→25℃, 5minafter 10cycles, Restore4H at 25℃	
7	Vibration Test (package state)	10Hz~150Hz, 100m/s2, 120min	Not allowed cosmetic and electrical defects.
8	Shock Test (package state)	Half-sine wave, 300m/s2, 18ms	
9	Atmospheric Pressure Test	25kPa16H Restore2H	
10	Liquid resistance	LCD module and control circuit in the button enclosure are resistant to drink spills	Water resistance: - In a typical button panel environment.

6.5 LCD Module Handling Precautions

The display panel is made of glass .Do not subject it to a mechanical shock by dropping it from a high place, etc.

If the display panel is damaged and the liquid crystal substance inside it leaks out ,be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

If the logic circuit power is off, do not apply the input signals.

To prevent destruction of the elements by static electricity be careful to maintain an optimum work environment.

6.6 Storage precautions

When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a longtime, the recommend condition is:

Temperature:	0 ℃～	40℃
Relatively humidity:	≤80%	

The LCD modules should avoid excessive dampness.