



CONSOLE OF DOMYOS CHALLENGE BIKE USE & TECHNICAL REQUIREMENTS



PRODUCT NAME	CONSOLE MODEL CODE	FG MODEL NAME	FG MODEL CODE
Challenge Bike - Console	8827682	Domyos Challenge Bike	8607949

Version	Date	By	Phase	Content
1.0	05-05-2022	Leo LV	GO INDUS	Initial release
2.0	09-06-2022	Leo LV	Before TR#1	BIKING 900 Keyflow Update; USB Charging limit the max of Current; Error Code update; Console PVP Update;

				Remove Hardware version number, Vectorgraph update
3.0	13-11-2022	Leo LV	Before TR#1.5	Update: <ol style="list-style-type: none">1. Console Model Code 88276822. Connectivity Specification3. Console traceability sticker location4. Keyflow5. No glue on the connector6. OTA UUID7. Design File8. Electronic Schematic/BOM/PCBA Layout
4.0	14-03-2023	Leo LV	Before TR#2	Update(feedback of TR#1.5): <ol style="list-style-type: none">1. Keyflow update2. The Hardware change from EMC modification

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1. INTRODUCTION

DOMYOS BIKING 900E is designed for passionate, intense users. 60% of users are Fitness users. They want a product that could help them to burn a maximum of calories, lose weight, and tone their body. They want a very comfortable, robust, and interactive product, to motivate and help them to reach their goals.

40% of users are cycling, running, and triathlete users. They want to continue practicing at home with high intensity and with an amazing immersive experience. They want to feel great sensations in high intensity.

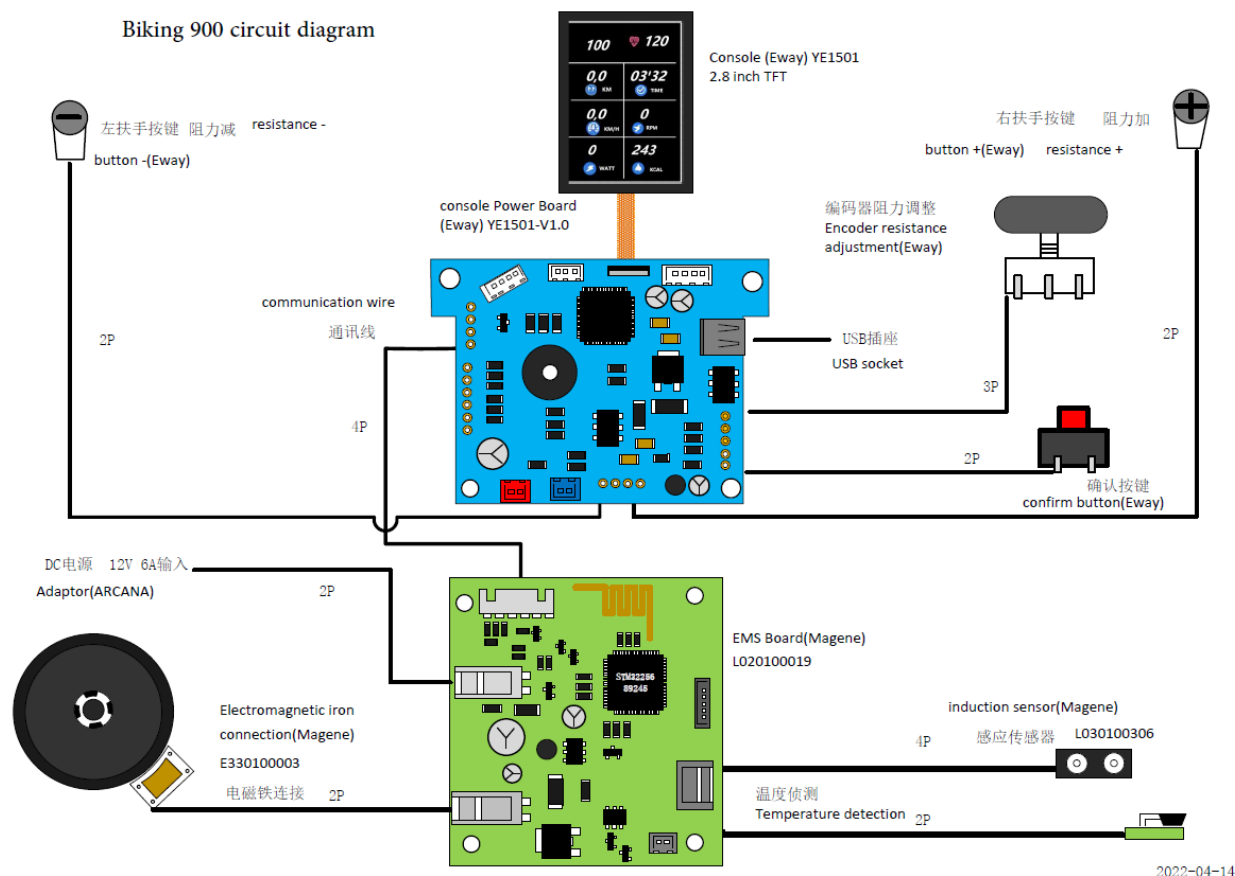
DOMYOS BIKING 900E is developed by Decathlon / ARCANA / EWAY(CONSOLE SYSTEM) / MAGENE(EMS System) in a collaborative way.

This document is the specification of the BIKING 900E CONSOLE SYSTEM:

Console YE1501 2.8 inch TFT / Console Power Board YE1501-V1.0 / Resistance Buttons(see detail in Charter 1.1).



1.1 PRODUCT ELECTRONIC DIAGRAM



Between CONSOLE System and EMS Board, EMS is the master, who is responsible for the power management, and Bluetooth; Console system is the slave, who is responsible for the user interface(display and button interaction), and USB charging.

1.2 **ELECTRICAL CHARACTERISTICS AND FUNCTIONS of CONSOLE**

Power supply: From EMS to Console Power Board: 12V(+/- 5%), from Console Power Board to 2.8 inch TFT: 3.3V(+/- 5%)

Screen: 2.8 inch TFT

Buttons/interface: two Resistance Buttons + Resistance Encoder Knob, START/PAUSE, STOP/MODE

Handle Bar Buttons: two Resistance Buttons

USB Charging: 5V(+/- 5%)/1A(+/- 5%)

Handpulse: No

Speaker: No

Buzzer: No

Analogiq HR (5.3KHz): No

FTMS: YES, from Magene EMS

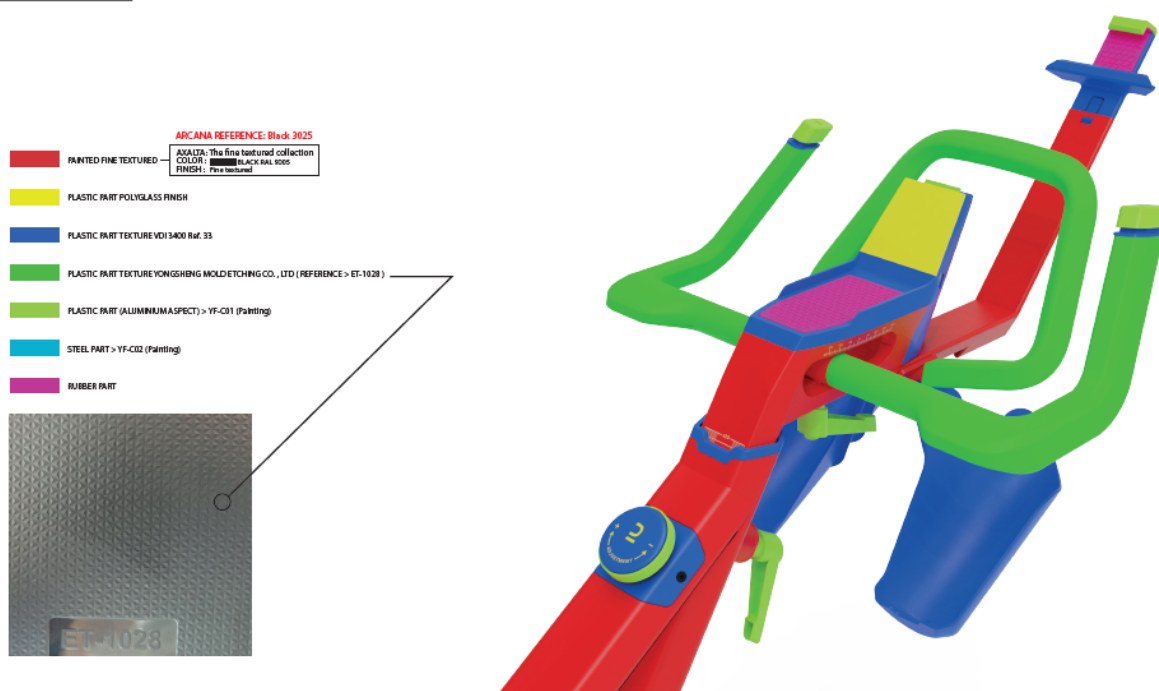
Cardio BLE: YES, from Magene EMS

OTA: YES

2. DESIGN

2.1. INDUSTRIAL DESIGN

Here below are pictures of the CMF for the CONSOLE system. For the detailed CMF design file pls refer to [20221117_CHALLENGE_BIKE_Design_File.pdf](#).



COLOR DEFINITION

CONSOLE PART

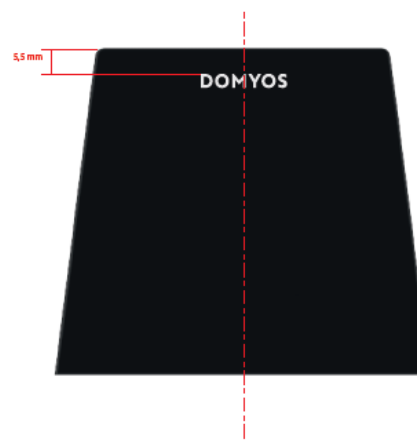
RUBBER PAD PART SPECIFICATION	①
COLOR : PANTONE BLACK C	
TEXTURE : VDI 3400 Ref. 33	
TFT SCREEN PART SPECIFICATION	②
COLOR : PANTONE BLACK C	
TEXTURE : POLYGLASS	
BUTTONS PART SPECIFICATION	③
COLOR : Injection > ALUMINIUM YF -Co1 (type A)	
TEXTURE : VDI 3400 Ref. 33	
ARM HOLDER PART SPECIFICATION	④
COLOR : PANTONE BLACK C	
TEXTURE : VDI 3400 Ref. 33	
CONSOLE BACK PART SPECIFICATION	⑤
COLOR : PANTONE BLACK C	
TEXTURE : VDI 3400 Ref. 33	
CONSOLE BASE PART SPECIFICATION	⑥
COLOR : PANTONE BLACK C	
TEXTURE : VDI 3400 Ref. 33	



COLOR / PRINT DEFINITION

CONSOLE PART

SCREEN PART SPECIFICATION
COLOR : PANTONE BLACK C
TEXTURE : POLYGLASS



SCALE 1:1

PRINT SPECIFICATION
PROCESS : SCREEN PRINTING
COLOR : PANTONE 10077 C



COLOR / PRINT DEFINITION

CONSOLE PART

CONSOLE BASE PART SPECIFICATION

COLOR :  PANTONE BLACK C

TEXTURE : VDI 3400 Ref. 33



SCALE 1:1

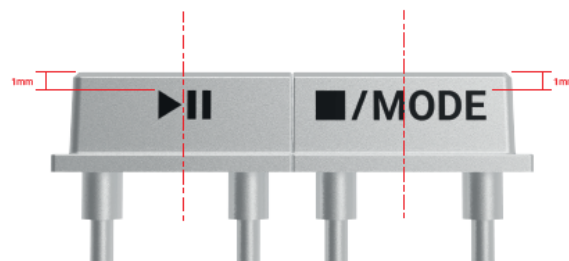
PRINT SPECIFICATION

PROCESS : SCREEN PRINTING

COLOR : PANTONE 10077 C 

PRINT DEFINITION

BUTTON PART



SCALE 1:1



PRINT SPECIFICATION

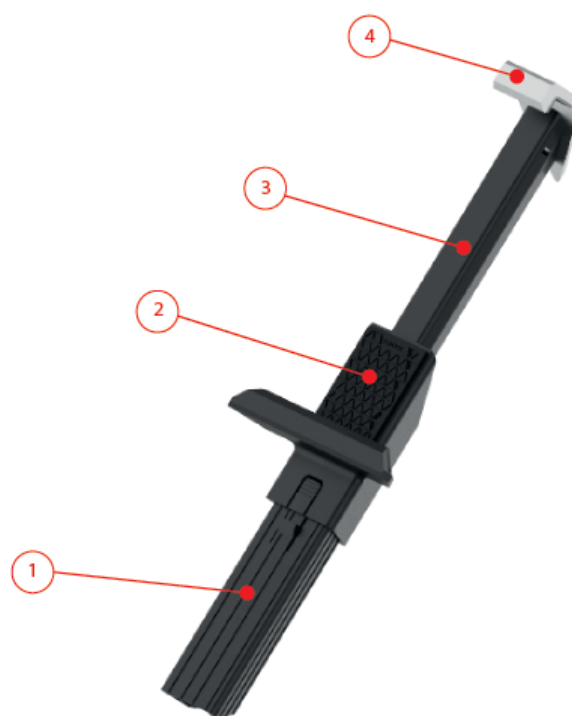
PROCESS : PAD PRINTING

COLOR : PANTONE BLACK C 

COLOR DEFINITION

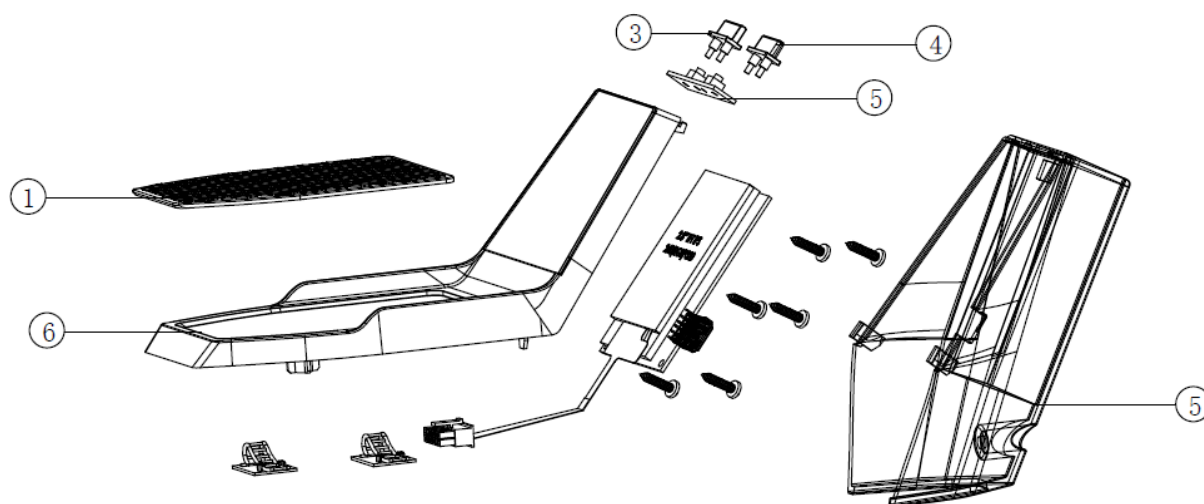
TABLET HOLDER PART

HOLDER BODY SPECIFICATION	1
COLOR :  Injection > Pantone Black C	
TEXTURE : VDI 3400 Ref. 33	
HOLDER BODY RUBBER SPECIFICATION	2
COLOR :  Injection > Pantone Black C	
TEXTURE : VDI 3400 Ref. 33	
HOLDER SLIDE SPECIFICATION	3
COLOR :  Injection > Pantone Black C	
TEXTURE : VDI 3400 Ref. 33	
PHONE HOLDER CAP B SPECIFICATION	4
COLOR :  Painting > ALUMINIUM YF -C01 (type A)	
TEXTURE : VDI 3400 Ref. 33	



The plastic parts are made by ARCANA, Eway makes the Console assembly then send to ARCANA for product assembly.

2.2. STRUCTURE EXPLOSION VIEW

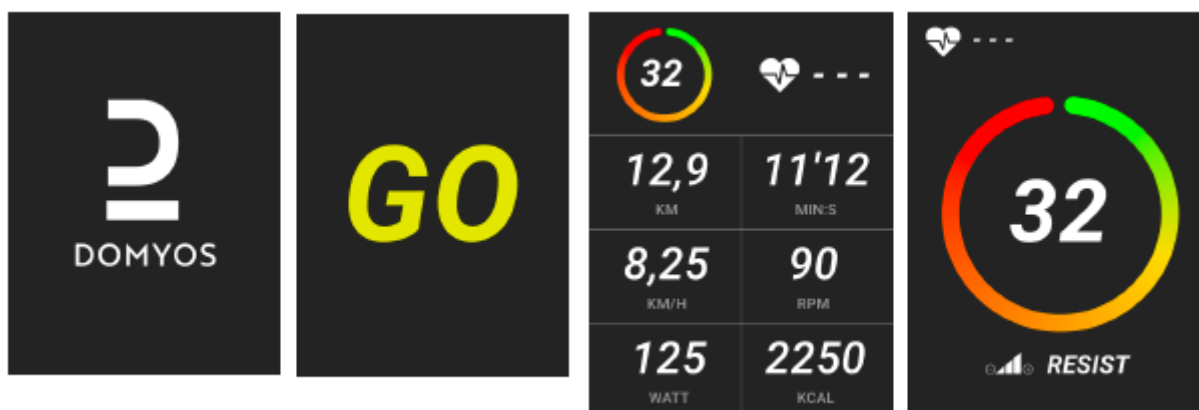


2.3. MECHANICAL DESIGN

[Mechanical 3D design CAD file](#) is available in PACE of DOMYOS BIKING 900E.

2.4. DISPLAY DESIGN

This is a TFT screen, the display is variable on each page. Example as below.



[screen Biking900_AI_20220330](#)
[Roboto.zip](#)

3. REGULATION, STANDARDS AND VALIDATION PLAN

Console is a component, it will be assembled into finish goods product to make regulation and standards test. Console has the obligation to be compliance with these requirements. Charter 3.1 and Charter 3.2 is the requirements on finish goods level.

3.1. REGULATION

DIRECTIVE 2001/95/CE	Machinery directive
DIRECTIVE 2014/35/EU	Low Voltage directive
DIRECTIVE 2014/30/EU	Electromagnetic compatibility directive
DIRECTIVE 2014/53/EU	Radio Equipment Directive
DIRECTIVE 2015/863	RoHS 3 directive (ROHS 10 Element)
DIRECTIVE 2005/32/CE	ErP(EC 1275/2008 & EC 801/2013)
BQB	

3.2. STANDARDS

MECHANICAL

ISO 20957-1:	General safety requirements and test methods
ISO EN 20957-5 :	Stationary exercise bicycles and upper body crank training equipment
GB 17498.1:	General safety requirements and test methods for stationary training equipment
GB 17498.5 :	Additional specific safety requirements and test methods for pedal crank training equipment

ELECTRICAL SAFETY

EN 60335-1 : 2012 + A11 : 2014 + A :	Household and similar electrical appliances - Safety
IEC 60335-1:2010+AMD1:2013+AMD2:2016 :	Household and similar electrical appliances - safety
GB 4706.1 : 2005 :	General requirements for safety of household and similar electrical appliances
AS/NZS 60335-1	

EMC

CISPR 14-1 : 2005 + A1 : 2008 + A2 : 2011 : EMC - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission

CISPR 14-2 : 1997 + A1 : 2001 + A2 : 2008 : EMC - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard

IEC 61000-3-2 : 2014 : EMC - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

IEC 61000-3-3 : 2013 : EMC - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

IEC 61000-6-1 : 2005 : EMC - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments

IEC 61000-6-3 : 2006 : EMC - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

EN 55014-1: 2006 + A1 : 2009 + A2 : 2011 \Leftrightarrow CISPR 14-1 : 2005 + A1 : 2008 + A2 : 2011

EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008 + AC : 1997 \Leftrightarrow CISPR 14-2 : 1997 + A1 : 2001 + A2 : 2008

EN 61000-3-2 : 2014 \Leftrightarrow IEC 61000-3-2 : 2014

EN 61000-3-3 : 2013 \Leftrightarrow IEC 61000-3-3 : 2013

EN 61000-6-1 : 2007 \Leftrightarrow IEC 61000-6-1 : 2005

EN 61000-6-3 : 2007 \Leftrightarrow IEC 61000-6-3 : 2006

EN 301 489-1 V1.9.2 : EMC and Radio spectrum Matters (ERM) ; ElectroMagnetic Compatibility standard for radio equipment and services; Part 1: Common technical requirements

Electromagnetic compatibility

GB 4343.1-2009

GB 4343.2-2009

GB 17625.2-2007

GB 17625.1-2012

AS/NZS CISPR 14.1:2018

AS/NZS CISPR 14.2:2015

RED

EN 300 328 V2.1.1

EN 301 489-1 & -17

SRRC

FCC ID

ISED ID

TOXICOLOGY

3.3. VALIDATION PLAN

Validation plan is Decathlon internal test, test report is available in PACE.

[DOMYOS BIKING 900 CONSOLE PVP_3-2022](#)

4. FUNCTIONS AND CONTROL

4.1. USER KEYFLOW

[keyflow_Biking900_V4.7_20230208.pdf](#)

DECATHLON CONTROL(CRITICAL)

Following the steps in the Keyflow file, the machine should react as keyflow defined.

ACCEPTANCE CRITERIA

1. The buttons are working when needed, **BAD EXAMPLE**([Video 1](#), [Video 2](#))
2. The turn knob is working when needed

4.2. USB CHARGING



DECATHLON CONTROL(CRITICAL)

Users can plug the devices for power charging during training.

ACCEPTANCE CRITERIA

1. Output Voltage is 5V +/- 5%.
2. The maximum charging current is 1A +/- 5%.
3. Smart Phones should work normally during USB charging. **BAD EXAMPLE**([Video 1](#))

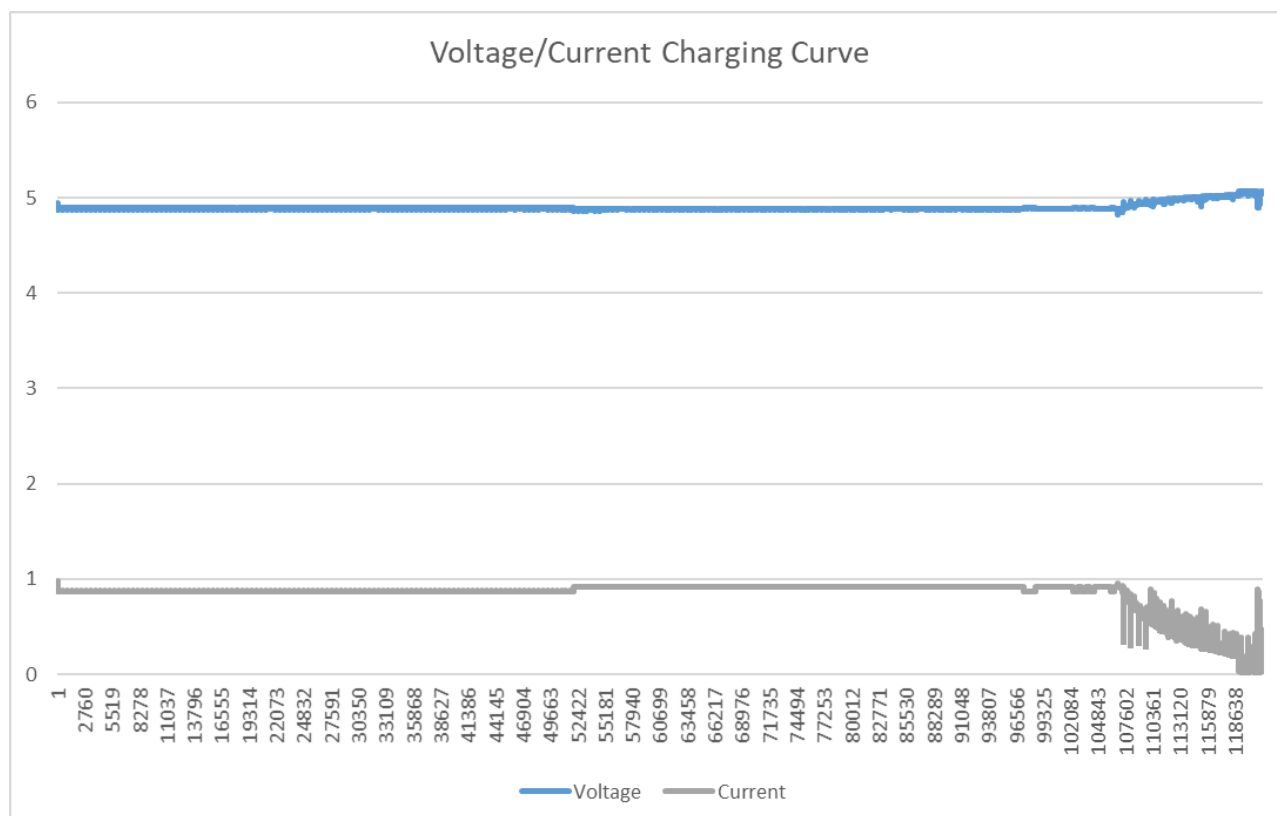
USB charging Voltage/Current Datalog:

Console System Test Setup: Use a 12V DC adaptor as the power source, and plug a low-power smartphone to start charging. Then get the datalog for 4 hours.

The purpose of this test is to see the deviation of Voltage, normally it should be within the range of 5V +/- 5% and the maxi current should be below 1A +/- 5%.

Test Result:

	Min	Max	Average
Voltage	4.822425	5.063246	4.901838
Current	0.023323	0.979541	0.829879



4.3. **PROTOCOL**

Protocol between Console and EMS Board

DECATHLON CONTROL(CRITICAL)

ACCEPTANCE CRITERIA



4.4. ERROR CODE

ERROR CODE	DEFINITION	ERROR CODE DETECTION	EXPLANATION ROOT CAUSE	HOW TO TEST ERROR CODE	DTS ACTION
E1	Communication error between Console and MCB	Either RX or TX out of response more than 5 seconds	1. Wrong connection of the cable 2. Bad connection between cable and connector	Disconnect either RX or TX for 5 seconds, E1 should display	1. Check cable/connector pin, replace cable 2. Replace Console 3. Replace MCB
E2	Resistance control failure(The resistance can not be adjusted)	1. When feedback current is 0A for 5 seconds 2. When feedback current is more than 4.8A for 5 seconds	1. Electromagnetic coil not connected or bad connection 2. MCB control/response system failure	Disconnect the Electromagnetic coil for 5 Seconds, E2 should display	1. Check electromagnetic coil connection 2. Replace MCB
E11	Temperature failure	1. There is No temperature feedback for 5 seconds 2. When the temperature of the electromagnetic coil is over 125°C for 5 seconds	1. Temperature sensor not connected 2. Temperature monitor system failure	Disconnect temperature sensor for 5 Seconds, E3 should display	1. Check temperature sensor connection 2. Replace MCB /*Check the user environment – not machine problem***/

DECATHLON CONTROL(CRITICAL)

Follow HOW TO TEST ERROR CODE, reproduce the error condition

ACCEPTANCE CRITERIA

The error code should be displayed on the TFT, and the Error display can be removed after pressing 4 seconds on the stop/mode button

4.5. VERSIONS AND TRACEABILITY

Console Power Board Hardware Version is x.x(REMOVE)

Console Power Board Firmware Version is x.x

Traceability sticker: Console serial number

Format: EWBK9ECEYYWwwxxxxx

Example: EWBK9ECE22W0300001

(the 1st console produced in week 03/2022) (EW = Eway, BK9EC= Console of BIKING 900E, E = English or C = Chinese?)

Using the serial number, the supplier is able to go back to the order number, component lot, and assembly task and is able to identify the origin of a problem (to solve it). The supplier is responsible for the date code system, settlement, organization, and management. Decathlon reserves the right to ask the supplier for the document used to control and manage the system.

DECATHLON CONTROL(MINOR)

Console traceability sticker is pasted on the rear cover of the Console(inside) and on the console package box.



ACCEPTANCE CRITERIA

Traceability sticker is the same as keyflow admin mode.

The firmware version is the same as keyflow admin mode.

DECATHLON CONTROL(MAJOR)

Bluetooth sticker(Domyos-Biking-XXXX) is pasted on the rear cover of the Console(made by ARCANA process).

Bluetooth is managed by Magene

4.6. OVER THE AIR UPDATE

The Console Power Board can be updated by OTA from the UART of the EMS board. See the detail in Chapter 6.

Name	UUID	Description
Service UUID	04831523-6c9d-6ca9-5d41-03ad4fff4dfa	Service Master UUID
Notify UUID	04831524-6c9d-6ca9-5d41-03ad4fff4dfa	Mobile reception, max. 20
Tx UUID	04831525-6c9d-6ca9-5d41-03ad4fff4dfa	Send on mobile, max 128+5

DECATHLON CONTROL(CRITICAL)

Update the Console Power Board via Eway SDK

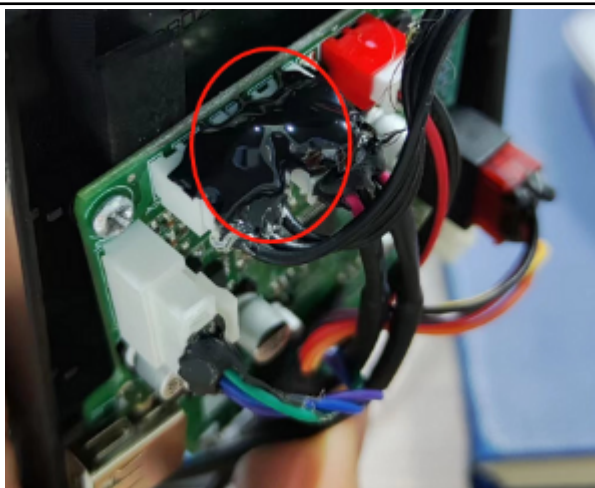
ACCEPTANCE CRITERIA

The update is successful. [Example video.](#)

4.7. CONNECTOR PROCESS

No glue on the Connector, it's not good for SAV service.

DECATHLON CONTROL(MAJOR)

**ACCEPTANCE CRITERIA**

DO NOT add glue on the connector, it's not good for SAV service

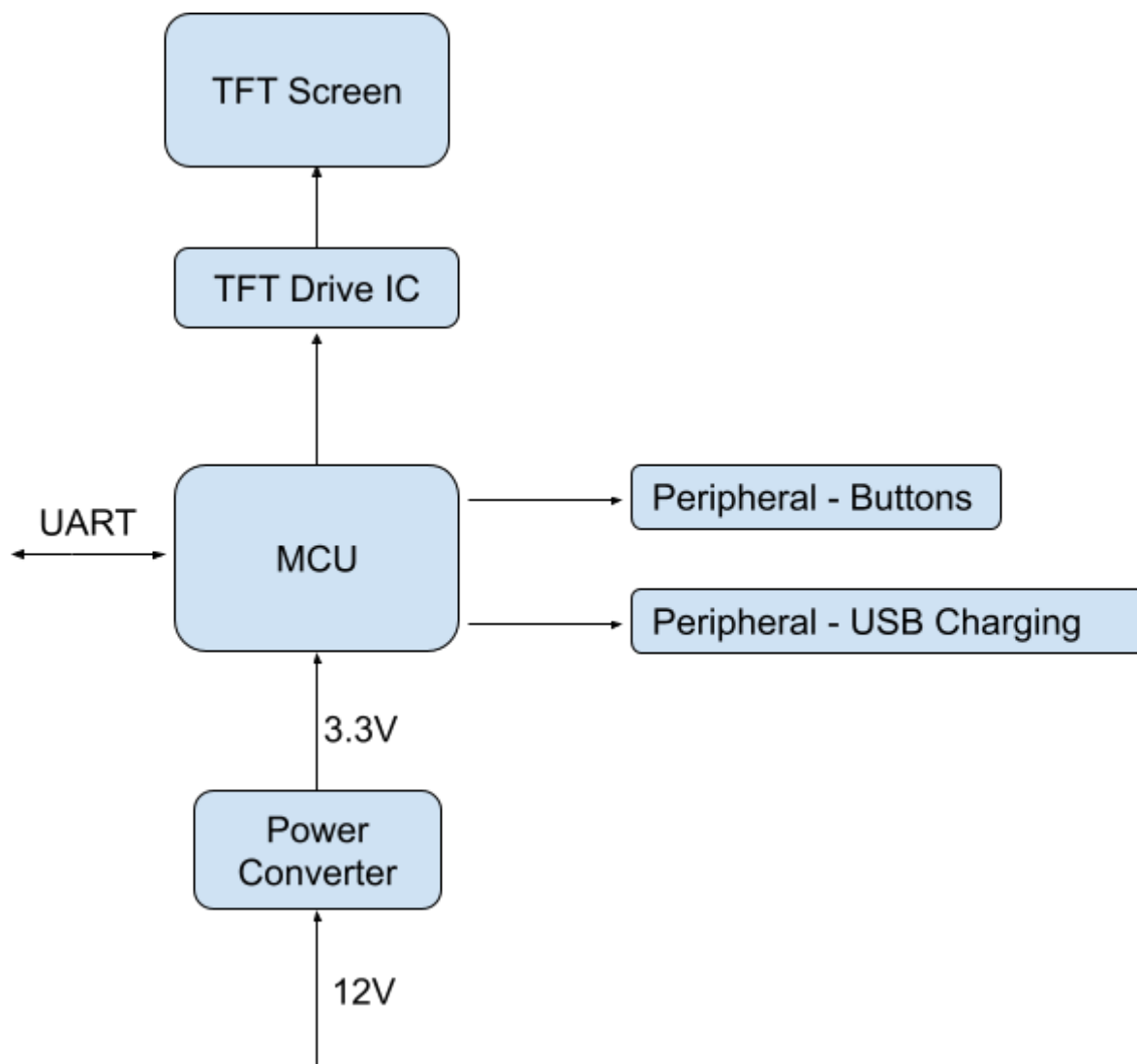
4.8. FUNCTION X(DUPLICATE TO USE)

Content Text in Roboto / Size 12

DECATHLON CONTROL(CRITICAL/MAJOR/MINOR)**ACCEPTANCE CRITERIA**

5. ELECTRONIC HARDWARE

5.1. ARCHITECTURE/BLOCK DIAGRAM



Here is the overall architecture of the CONSOLE.

5.2. ELECTRONIC SCHEMATIC

[BIKING 900 CONSOLE Schematic](#)

5.3. PCBA LAYOUT

[BIKING 900 PCBA Layout](#)

5.4. *BILLS OF MATERIAL*[Production BOM](#)**5.5. *MCU DATASHEET***[MCU DATASHEET](#)**5.6. *2.8 inch TFT DATASHEET***[TFT DATASHEET](#)

6. FIRMWARE/CONNECTIVITY

6.1. ***TITLE 1(DUPLICATE TO USE)***

Content Text in Roboto / Size 12

6.2. ***TITLE 2(DUPLICATE TO USE)***

Content Text in Roboto / Size 12

7. PACKAGE

Console Package design is delegated to the Console supplier. Rank 2 supplier sends Console to Rank 1 Maker(China local delivery). After that Console is assembled in the product or put in a Carton box.

Console supplier is responsible to propose the package which can pass the package validation test(list in Charter 3.3).

8. APPENDIXES

File	Name & Version
Keyflow	keyflow_Biking900_V4.7_20230208.pdf
CMF Design	20221117_CHALLENGE_BIKE_Design_File.pdf
UART protocol between Console and EMS	Protocol between Console and EMS Board
FIRMWARE/CONNECTIVITY	Biking 900 Connectivity Specification
CONSOLE PVP	DOMYOS BIKING 900 CONSOLE PVP_3-2022
Console Schematic Design	BIKING 900 CONSOLE Schematic
PCBA Layout	BIKING 900 PCBA Layout
MCU Datasheet	MCU DATASHEET
TFT Datasheet	TFT DATASHEET
BOM	Production BOM
Vectorgraph of TFT Screen	screen_Biking900_AI_20220330
Font of TFT Screen	Roboto.zip
Console 3D	Mechanical 3D design CAD file