Desktop Station

DCC / MM / AnalogPWM

Wi-Fi COMMAND STATION

Desktop Station

DSair2

User Manual - English

Version 0.1

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1. Introduction

DSair2 is a command station that can be operated from a smartphone / tablet terminal by wireless LAN conforming to Digital Command Control (DCC) standard which is a world standard digital communication standard of railroad model.   Please observe the precautions and use it correctly.

DSair2 has command station function compliant with NMRA DCC standard.   However, the CV reading function is not installed

DCC is a digital railway model communication standard proposed by
the National Railway Model Association (NMRA).

2. Usage license agreement

Usage license agreement.   Use for commercial and business use is prohibited by license.

3. Guarantee

DSair2 guarantees 1 month 's operation guarantee for finished products under our company' s usage condition.

As for kit items, we cannot judge according to customer's assembly accuracy, so we will replace only the corresponding parts of initial failure with good parts.   Customer's usage · Assembly · Failure caused by soldering · Breakdown will not be compensated at all.

We will not indemnify compensation for customer's damage / opportunity loss caused by unknown defect on DSair2's product.   Please prepare redundancy and spare equipment, please respond.

If a failure occurs beyond the warranty period, you will be entitled to extensive repair (maximum amount of repair fee will be up to DSair2 finished product equivalent).   The repair service may be terminated without notice depending on the inventory status of parts.

Our warranty is not covered by our warranty regarding misuse, negligence, damage caused by prohibited items described in the manual, breakdown, opportunity loss.

The scope and contents of the warranty are subject to change without notice.

4.Precautions · Prohibited items

DSair2 must observe the precautions and use it correctly.

⚠️	Do not use in outdoor use, liquids, humidity, oil, dust, sealed, high temperature / cryogenic environments
⚠️	Do not use in medical environment. Danger of malfunction due to harmonic noise included in DCC.
⚠️	It becomes Wi-Fi compatible wireless equipment. In some countries / regions, it cannot be used by law. For details, refer to the instruction manual of FlashAir. Never turn on the power or use it in areas, buildings, or indoors where the use of wireless devices is restricted.
⚠️	Short, electric shock accident, smoke, risk of capacitor rupture. Do not touch the rails and wiring during energization.
⚠️	Use only for products that conform to Digital Command Control (DCC) specifications.
⚠️	Age 13 years and over. Use of infants and children should be used with supervision and responsibility of parents
⚠️	When abnormal noise, unusual odor, smoke, stop using it immediately, ask the manufacturer for repair. Continued use prohibited.
⚠️	Observe the operating voltage and current range. DC 12 - 19 V, (continuous) 2A max. Use an authorized power adapter with a PSE mark permitted for use in Japan. Use a power adapter with a voltage that conforms to the specifications of the scale / locomotive / decoder.
⚠️	The user is always on while the power is on / in use. Regardless of whether the power supply is turned on or not, leaving DSair2 leaving the AC adapter connected, unattended operation, prohibition of unattended operation. When leaving, do disconnect the AC adapter from the outlet and keep the DSair2 not turned on.

5. Equipment necessary for operation

In order to run DSair2, the following equipment is required. In addition, a separate line, feeder line, AC adapter, a locomotive equipped with a decoder, etc. are required.

	DSair2 body *(Installing FlashAir W - 04 with web application already set up)*
	MANDATORY :　Flash Air W – 04.　One of either 16GB, 32GB or 64GB. *(Before W-03, it is not covered by operation guarantee. W-02, W-01 do not work with DSair2, at all).*
	AC adapter DC 12V ~19V * 1A or more ** Center plus⊖-◉-⊕, inner diameter 2.1 mm, outer diameter 5.5 mm. In Japan, please purchase from Akizuki Electric etc. The followings are our recommended DC power supply.
	Feeder wire, AWG 24 or more recommended. Please select the electric wire assuming that the current of 2A flows.
	DCC or MM2 locomotives equipped with decoders, railroad tracks, points or turnouts, etc.

** Voltage to be used changes according to the scale of the locomotive.
For Japanese type N, HO (No. 16) please use 12Vdc. We use about 12Vdc ~ 19Vdc for HO of Western countries *(Märklin system 16Vdc ~19Vdc).*

6. How to use the equipment

6.1 Description of appearance and connector, LED
DSair has two connectors and an LED for status display.　When AC adapter is attached to CN1, the RUN LED flashes.　If it does not light up, an error has occurred.

USB	Update port and debug use for PC
DC12-19V	Connect a DC power supply. It is Φ 2.1 mm, center plus. It corresponds to 12V to 19V.
TRACK	Connect the feeder wire to the track. Please use a minus precision screwdriver for the removable terminal, peel off the wire cover and fix it with screws.
RESET	Reset button. Forcibly shut off the power supply to the track.
RUN LED	It blinks slowly when the power is turned on. Always on:-　Line power ON Slow blinking:-　Waiting High-speed blinking:- Error occurred (voltage detection error, over current error, Wi-Fi card error)
CARD SLOT	Toshiba Memory's FlashAir W-04 Wi-Fi Card is required. Always insert FlashAir W-04 to this slot.

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6.2 Specification

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	specification	Remarks
Protocol	DCC, Märklin Motorola 1, 2, AnalogPWM	Märklin mfx or mfx+ is not supported yet. mfx or mfx+ locomotives can be used in MM2 compatible mode.
Speed step	DCC 128 Step fixed Märklin 14 step fixed	
Locomotive address	DCC 1-100 (2 digits) and 101-9999 (4 digits) Märklin 1-80 (MM 1) and 81-256 (MM 2）	
Accessory address	DCC 1-2040 Märklin 1-320	
Corresponding voltage	12V - 19V	
Output current	Continuous 2.0 A, instant 4.0 A	
Current protection	Automatic stop at over 6.3 A (10us)	Attention to inrush current
Voltage protection	Less than 9 V, or more than 20 V	
Card access	MMC compatible mode (SPI)	

7. How it works

DSair2 is a DCC command station based on open hardware Arduino and FlashAir (Wireless LAN SD card).　We combine open technologies to realize advanced Wi-Fi compatible command stations. No router or PC is necessary. With DSair2, you can drive wireless DCC train models freely with just your smartphone / tablet.
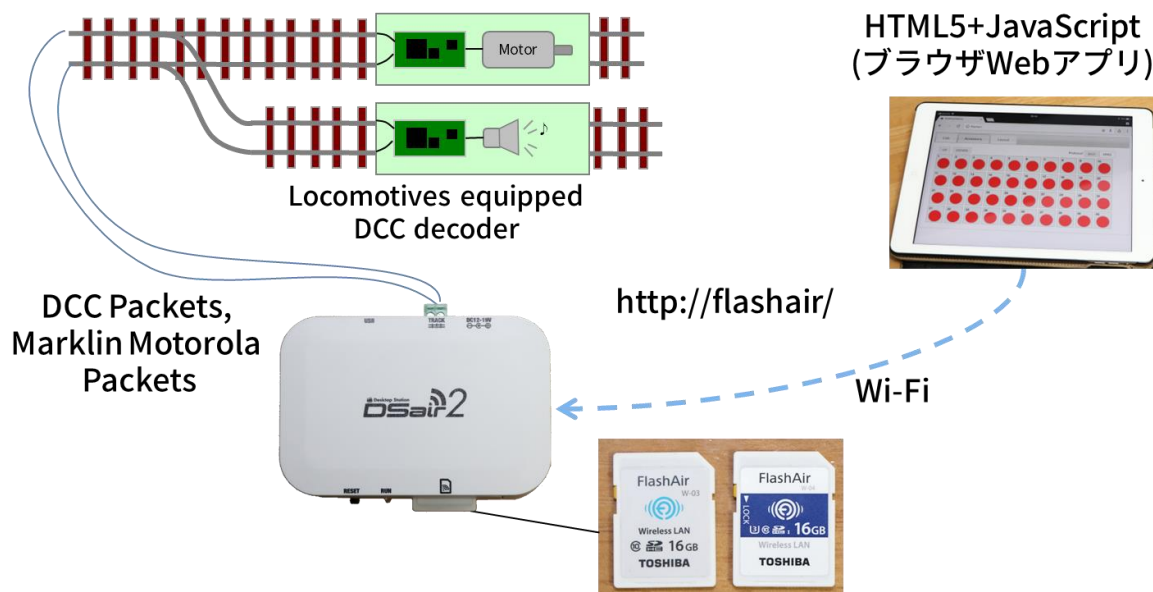
8.0 How to use the application

8.1 Supported models

Have a browser that supports HTML 5, JavaScript, CSS 3. iOS 9 or later, Android 5.0 or later recommended.

Operation confirmation is confirmed with Huawei Media Pad M5 (Android 7.1) and Chrome 65 for Windows.

8.2　Installing the application

It is not necessary to install applications dedicated to smartphones and tablet devices.　When connecting to DSair2 and accessing **http://flashair/** by the browser, the Web application including the operation screen is automatically downloaded on the terminal.

For this reason, all operations are done on the browser.

8.3　Connecting the smartphone to the DSair2

Once launched, DSair2 will publish * 1 the standard SSID as FlashAir _ ***** (***** is an arbitrary list of alphanumeric characters).　The password is **12345678**.　You can connect to DSair2 by accessing this SSID with wifi from a smartphone, tablet or PC.　After connecting, please start up the browser (Safari, Chrome, Firefox etc) and access **http: //flashair/**.

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* 1 SSID can be changed on the application.　Please do not forget to refrain from SSID and password set by user after changing.　We cannot support reset method etc.　(Reset work is chargeable support)

Table 1 FlashAir's HTTP Specification

item	specification
IP address	Automatic issue (DHCP)
DNS	Automatic (DHCP)
Proxy	Please do not set.
IP version	It is only for IPv4.
Access destination URL	http://flashair/

I will introduce iPad Air 1 (2015) as an example.　First, turn **ON** the DSair and check that the LED is blinking slowly.　Open Wi-Fi from the setting screen and look for FlashAir _ *****.　Once found, connect and enter the password **12345678**.


Next, open the browser.　I am using Chrome here.　You can also use Firefox or Safari.
If you open http://flashair/, you will be able to operate as follows.　DSair can control different locomotives separately from multiple smartphones / tablets / PCs.　Let's have fun with your friends and colleagues.
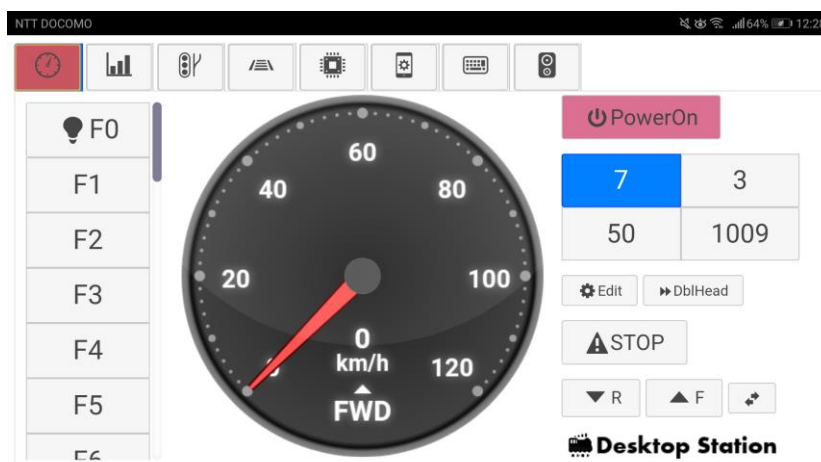
8.4　　Locomotive screen

It is the screen right after startup.　Buttons such as speedometer and function cannot be operated unless the line power supply is turned **ON**.　If another connected terminal turns on **PowerOff**, it will be displayed in conjunction with **PowerOff** display.
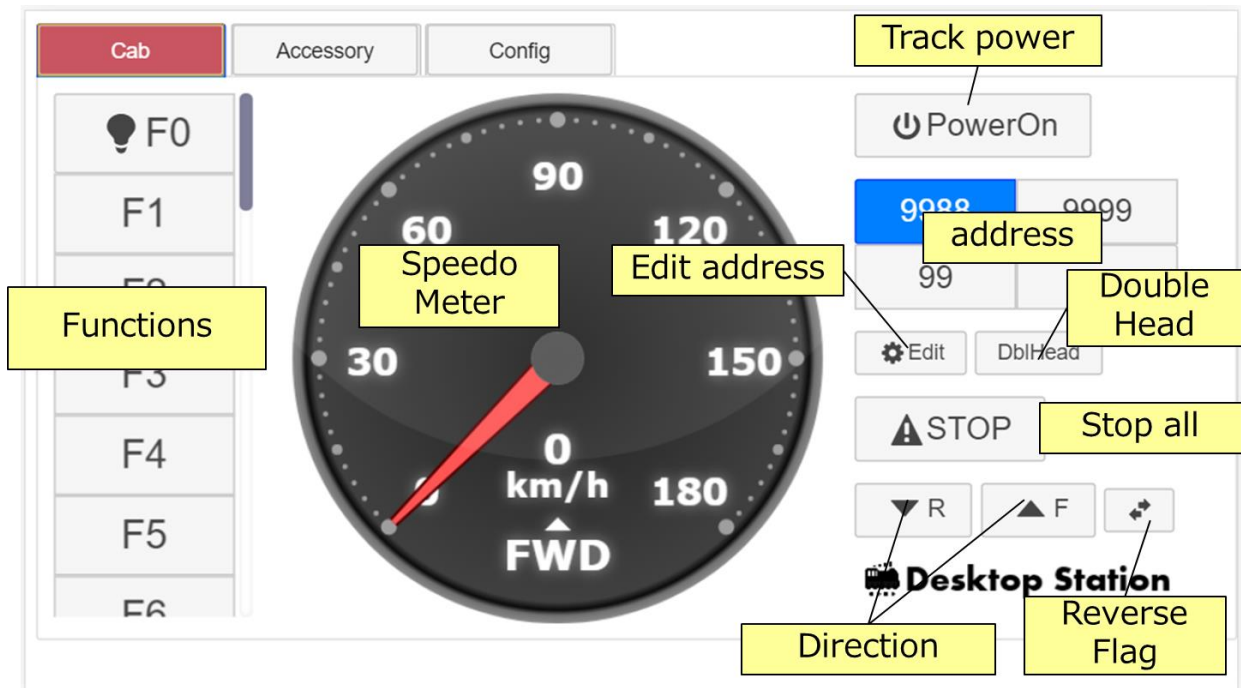
8.5　Points or Turnout screen

This is the screen that manipulates points or turnouts.　Switching between DCC and Märklin can be done on the **Config** tab. Point operation can be done only at power **ON**.

Press the **Edit** button to switch point or turnout images.　When you click (tap) the corresponding address, the image changes.　Press the **Edit** button again to save the change result and return to the operation mode.
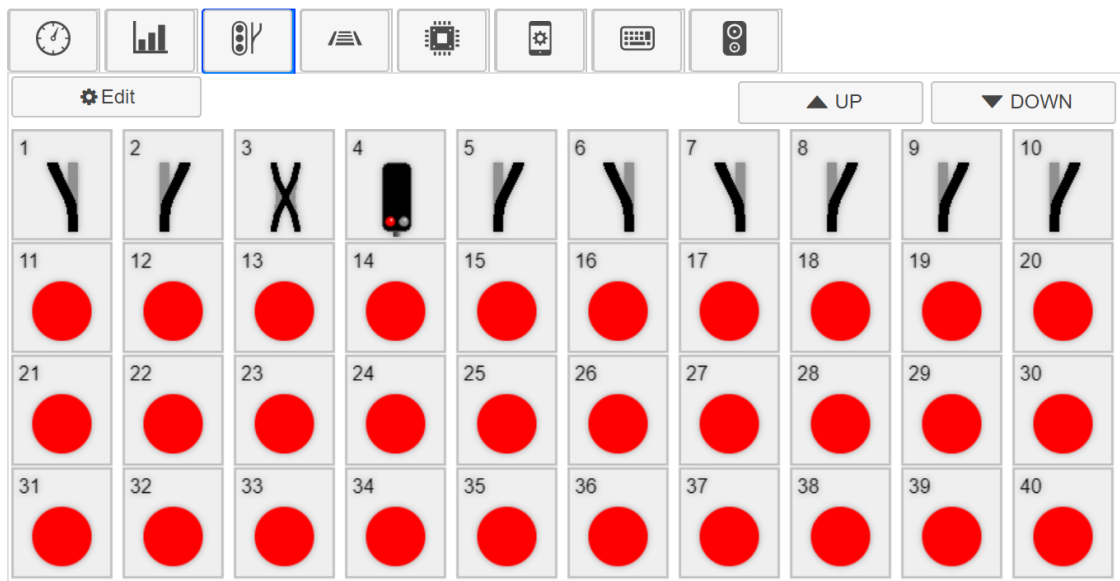

8.6　CV Read and Write

DSair2 has CV read function at the main track. This CV Read & Write function must run when DSair is power off.
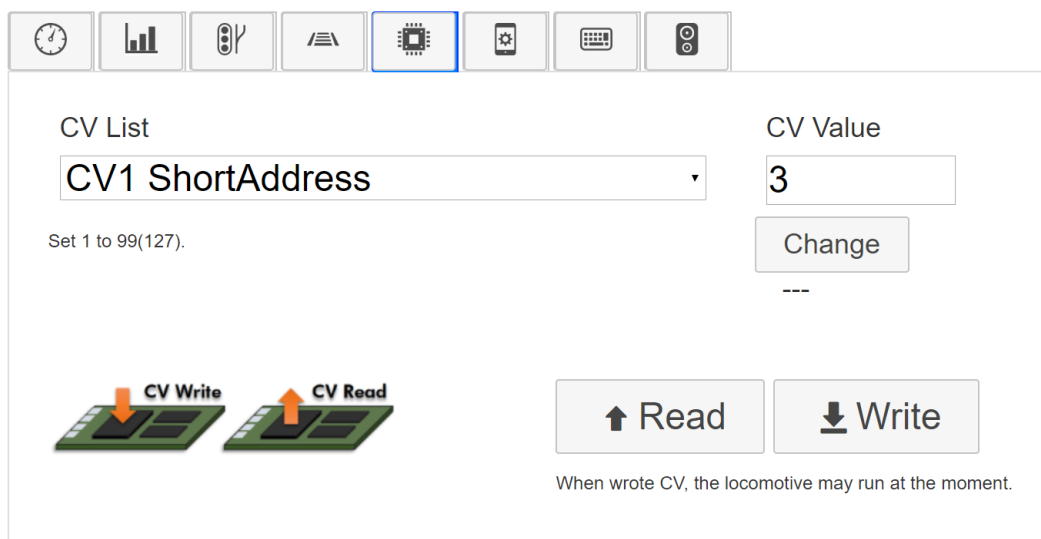
8.7   Web Sound

Web Sound function means you can play MP3 files in FlashAir SD card. If you have Bluetooth speaker, you can use to this function.

MP3 files are automatically listed at this screen. When you tap the file name button, then play soon after downloaded.
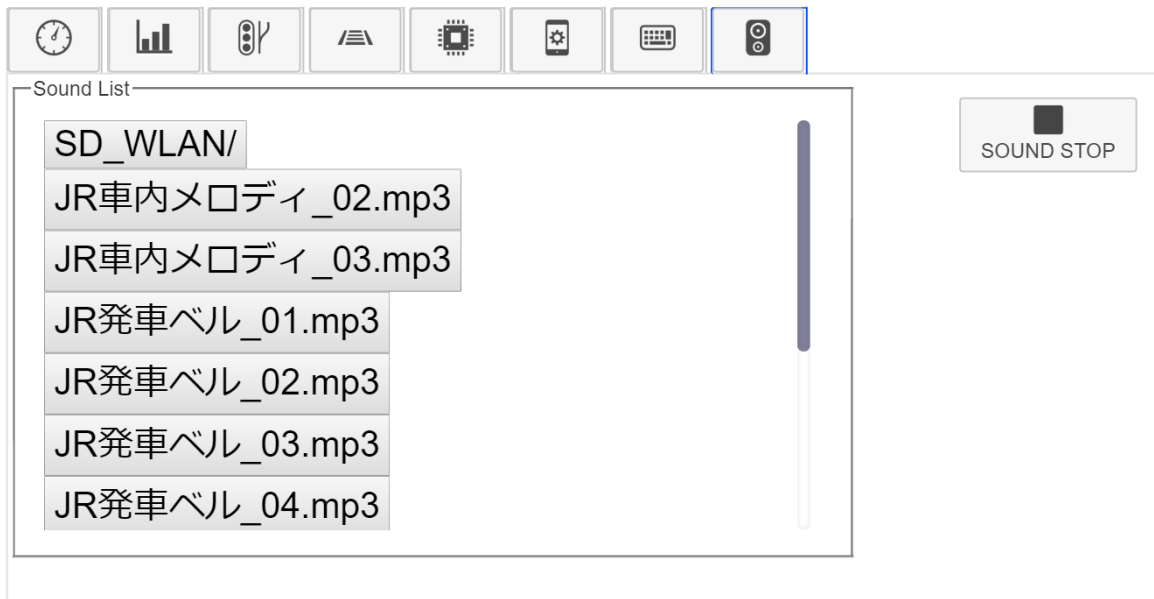

8.8   Track Layout Screen

You can edit track layout and assign turnout address to turnout icon. You can control easily turnouts at this track layout screen. Pencil icon means edit mode for turnouts address.
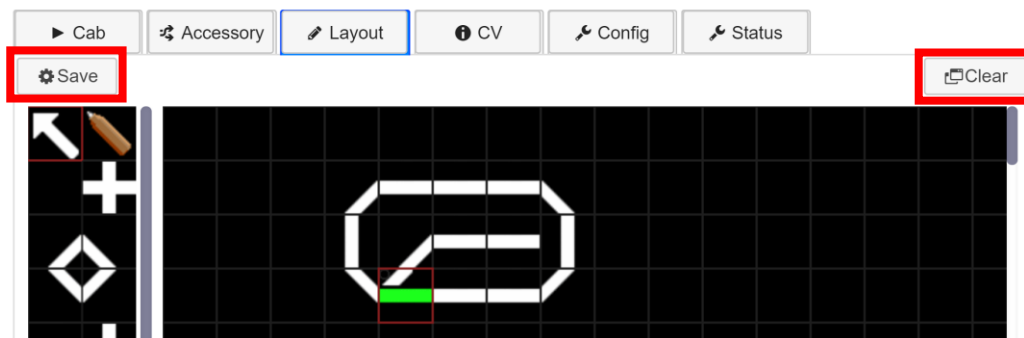
8.9   PWM Analog power pack mode

DSair2 has PWM Analog power pack mode. This mode can use at power-off. Please note almost every analog locomotives do NOT support DCC/Marklin digital mode. Do not place analog locomotives on the track when DCC/Markin digital mode.
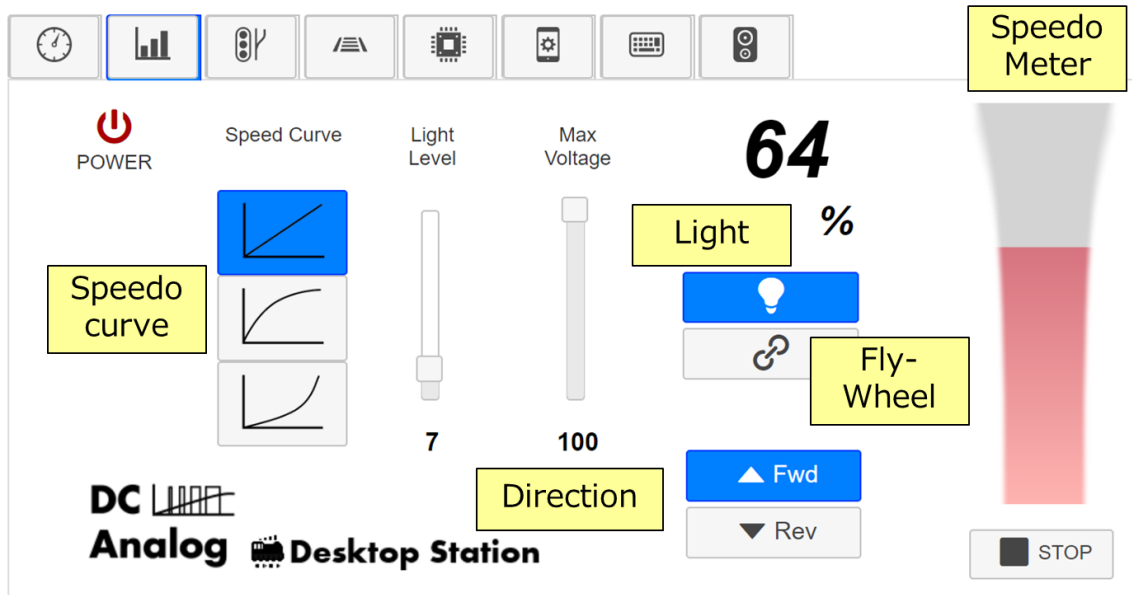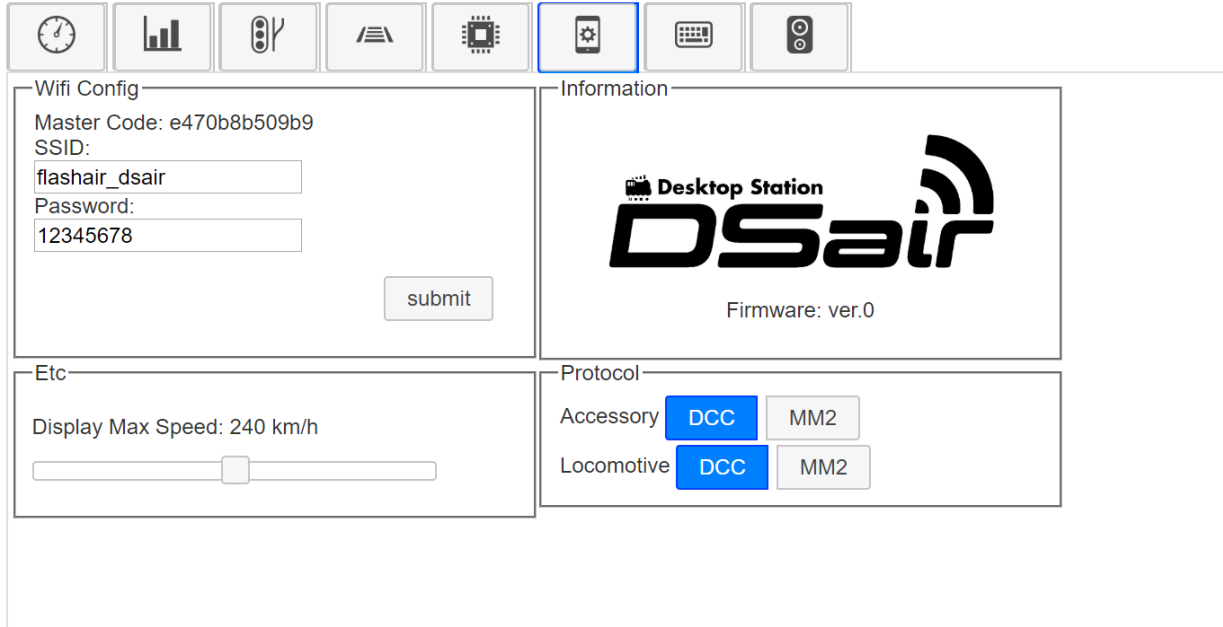
If you want to use Pure DC(excluded carrier pulse), we provide an option which is Pure Analog Adapter. See the following url.

https://desktopstation.net/wiki/doku.php/pureanalogadapter
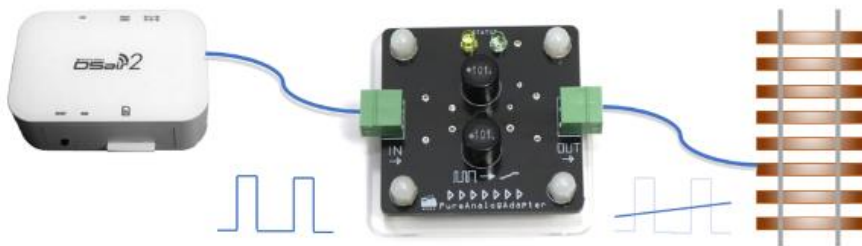
8.10   Setting screen

You can set Wi-Fi settings (change SSID, password), change display speed of speedometer, set point accessory protocol.

8.11　Address change
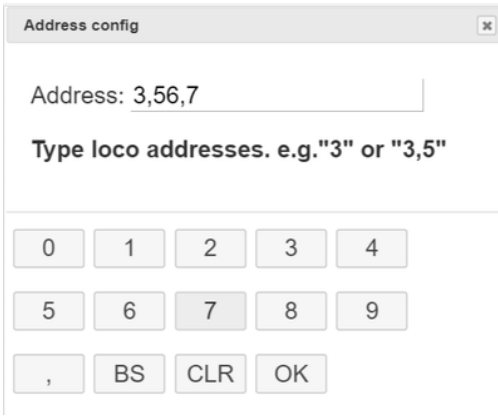
Explain how to change the operation target address.　First, in the initial state, only address 3 can be operated.　To add an address, press the Edit button.
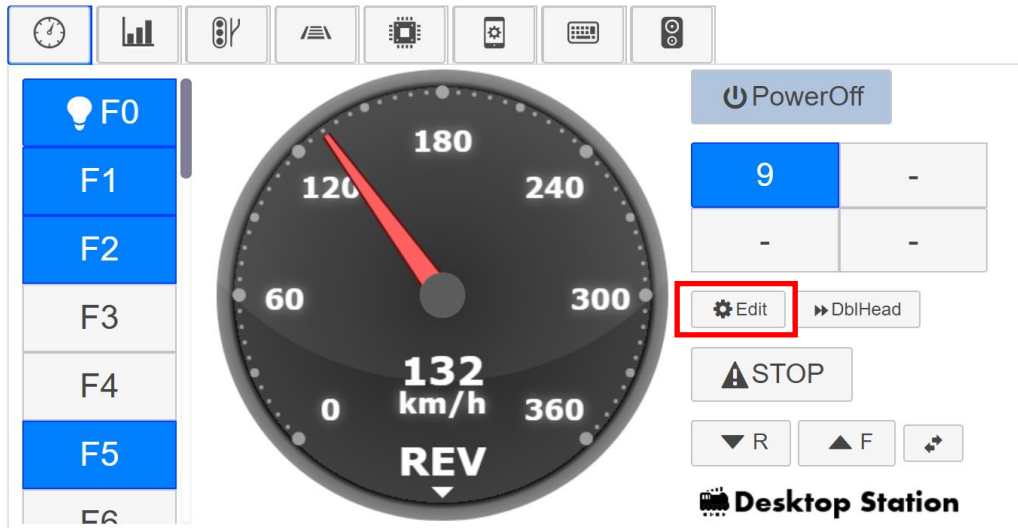
Enter addresses separated by commas.　The address range is from 1 to 9999. If you enter 0 or 10000 or more, an error occurs.
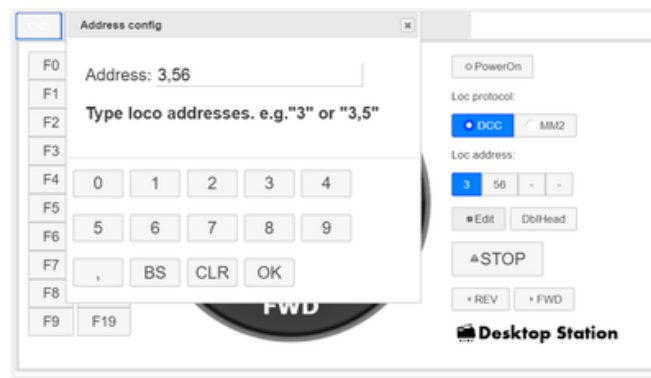
Since 3,56 are registered, 7 is added. Press ",", "7" button.
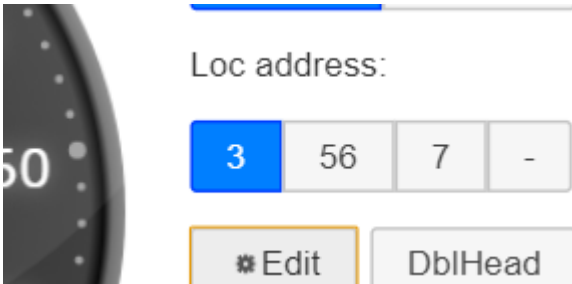
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When you press OK, it will be reflected in the four address button positions.

When you press the button, you can operate the locomotive at that address.

This address will be automatically saved and will be reflected even if it is restarted next time. Since saving is saved in the browser of the terminal, it will not be reflected on other connected terminals.

9.0 How to update

9.1 Updating DSair2 Firmware(via USB)

The work to be introduced here is for people who can do their own work.　Those who cannot update at your own risk, in principle, please apply for a paid update service.

No.	Work procedure
1	Download the latest firmware from below. **https://desktopstation.net/wiki/doku.php/dsair2**
2	Prepare an USB cable which has mini USB connector.
3	Download Arduino IDE and install it
4	Download CH340G USB Driver and install it. See the following procedure url. https://desktopstation.net/wiki/doku.php/install_driver
5	Run Arduino IDE Note: If you used Arduino IDE 1.8.0 or later, you need to configure the board as *Arduino nano* and also the processor as *ATmega328P (Old Bootloader)*.
6	Connect DSair2 to your PC using USB cable
7	Upload DSair latest sketch.
8	Remove USB cable. That's all.

9.2 How to set / update FlashAir application (file update in SD card)

9.2.1 Using update tool

Download "DSair update tool" at DSair site(DSair Updater).
Unzip it and run "DSairUpdater.exe".

You can see the following window.
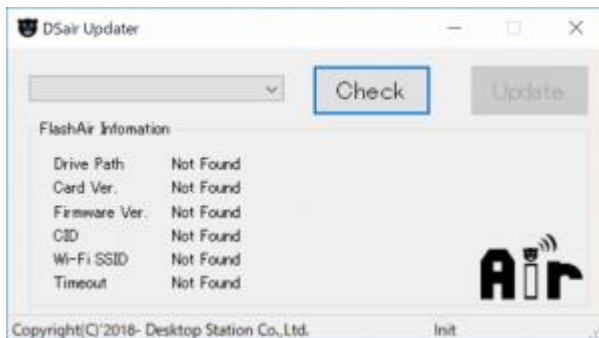
Insert FlashAir W-04 firmware 4.00.1 or later. Then click Check button.
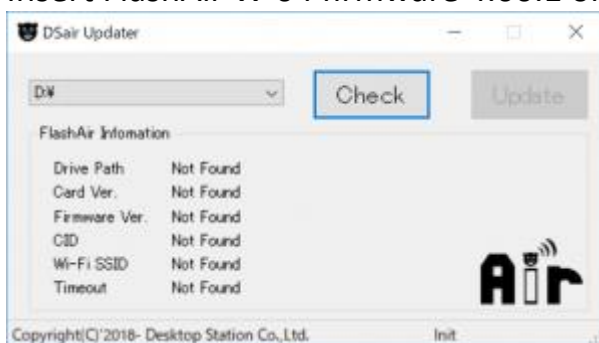
You can see FlashAir internal information. If Firmware Ver is 4.00.00, you must update your FlashAir using Toshiba's firmware update tool. If not, you can udate(install) DSair web app to FlashAir.
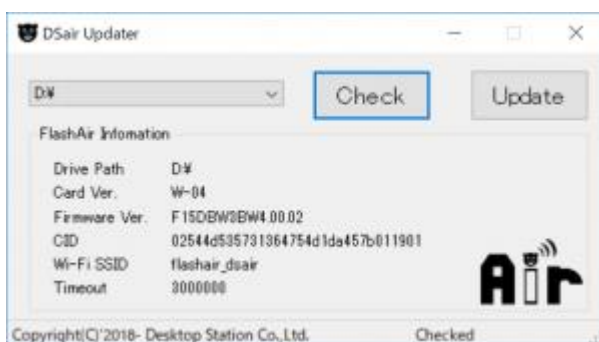
Finally, you get the following message window. The update (install) process is complete.
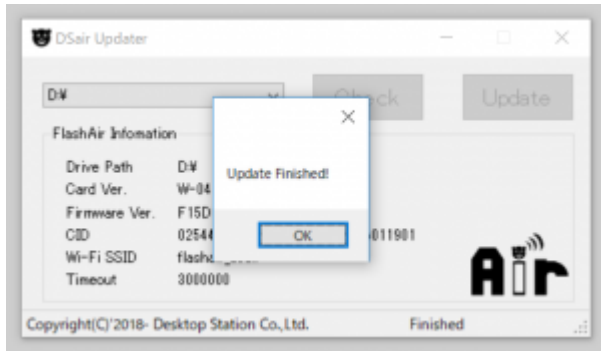
Finally remove FlashAir using safety remove process.

That's all!

9.2.2 Manual update
You can update files in the hidden folder SD_WLAN in the SD card by copying them from the SD_WLAN folder of the latest firmware.　If you can not set it up at your own risk, or update it, please apply for a paid update service or a chargeable FlashAir.

Application for DSair already set FlahAir W – 04　16 GB
Selling price 6800 yen

※　The update service will be 2000 yen.

If you purchased FlashAir's W-04 yourself, please pay attention to the firmware version. Some distributed goods do not operate normally because it is the initial version 4.00.00. Update tool is provided by Toshiba on the Web, please update first.

please note!
There is a report that the firmware update of W - 04 fails in the built - in SD card slot of Fujitsu made notebook PC.　If you are using Fujitsu made PC please note firmware update.　There is no problem in normal file reading / writing.　If you failed and the card becomes unusable,

please ask Toshiba Memory for support.   In addition, because parallel import version can ot receive support, there is no choice but to destroy if it fails.   Please purchase at an authorized dealer in Japan and update.

After downloading the FlashAir application which is distributed above, when FlashAir is inserted into the SD card slot on the personal computer, access the hidden folder called SD_WLAN and overwrite and save the following files.

For example, when the drive of FlashAir appears in the E drive, you can move it by directly typing E: / SD_WLAN / on the screen to drive the path.   Please also consider setting change to show hidden folder · file.
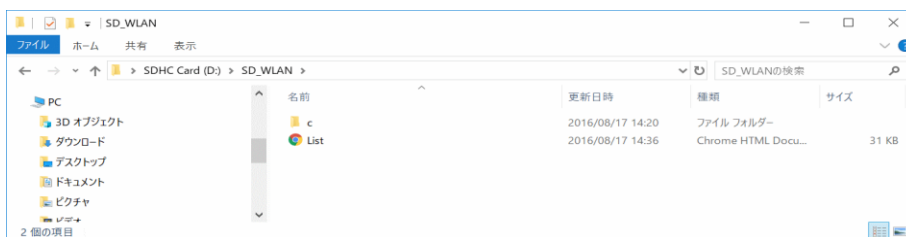
There is a hidden text file called CONFIG, so open it with a text editor. Like the SD_WLAN folder, you cannot see it normally, so change the setting to show hidden files.   Or enter E: \ SD_WLAN \ CONFIG and press ENTER, you will be able to edit in Notepad.

Add the line as follows and add "APPAUTOTIME = 3000000".   This additional command sets the time to shift to the power saving mode longer than usual.
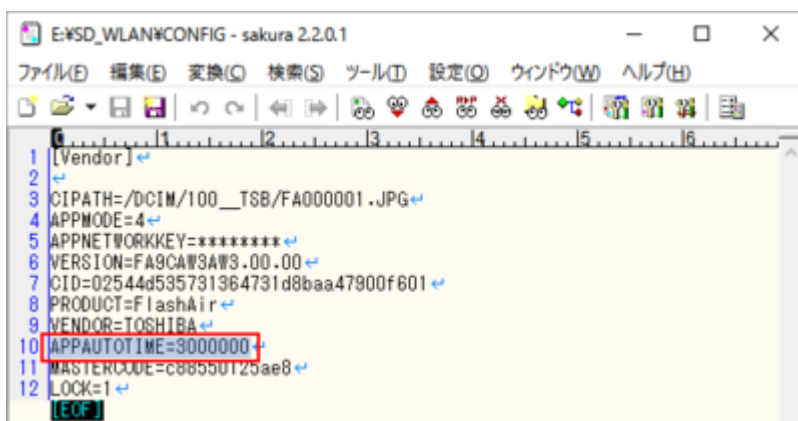
```
[Vendor]
CIPATH=/DCIM/100__TSB/FA000001.JPG
APPMODE=4
APPNETWORKKEY=********
VERSION=F15DBW3BW4.00.00
CID=**************
PRODUCT=FlashAir
VENDOR=TOSHIBA
APPAUTOTIME=3000000
MASTERCODE=***********
LOCK=1
```

With the above work, the setting is completed.　　Please copy and paste all files / folders under SD_WLAN in the downloaded ZIP file into the SD_WLAN folder, remove it, and plug it into the SD card shield.

10.0   Support

10.1 Update service

Update DSair to the latest firmware. It also performs operation check, health check, maintenance simultaneously.   Shipping fee to our company, please bear the user.

Shipping & Update Fee	Price
Shipping fee to our company	User pays shipping fee
Update work fee, by our company	2000 Yen
Return shipping fee to User	400 Yen *(Japan ONLY)*

10.2 Usage Questions

For usage etc., please use the Digital Railway Model Forum which is a communication site between users managed by our company.

https://desktopstation.net/bb/

10.3 When a fault occurs

Please inform us of the status of breakdown by e-mail. We will provide services such as repair.

yaasan@desktopstation.net

11.0   Troubleshooting

11.1 DSair does not turn on.
Is the AC Adapter connected?
If the RUN LED does not blink, DSair is not booting properly.
Is the AC adapter properly outputting voltage?
Short wiring in DSair?   Please check the soldering.

11 .2 LED Flashes rapidly when line power is on.
In case of blinking once:-   Voltage is not in the normal range.
Flashing twice:-   FlashAir card cannot be recognized.

11.3 Power supply does not flow in the track
· If the track is short-circuited, the protection function automatically operates. It is not displayed by LED during short protection operation.
· In locomotives equipped with large capacity capacitors, inrush current is excessive and safety functions may work.
· When the inside of the DSair's case is generating heat, the overheat cutoff function works and no current flows in the line. Do not use in an overload environment where the output current always exceeds 2A.

11.4 CV cannot be read
CV reading circuit is not installed.   Please use DSmain or DSbluebox.

11.5 I cannot write CV
· When the decoder starts very slowly, there are cases where the CV write command is moved before starting, and there are cases in which writing cannot be performed normally.
· There may be some problem on the decoder side. Please check if it can be written by other command station.

11.6 The locomotive does not move
· Is the motor connected?
· Are the feeder wires and the wiring inside the locomotive properly connected?
· Is the connector or screw stop loose?
· Have the decoder failed?

11.7 Locomotive movement is slow

· In the case of a large layout, the voltage may drop due to the voltage drop of the line. Apart from the track, please increase the feeder wire and wire it.

11.8 Point does not move

· Märklin digital points will not switch if there is no voltage above 16V.

· Is there pebbles etc. stuck in the point

· In some manufacturers, the point address may be offset by four (offset).　Please + 4, please shift the address and operate.　DSair is an implementation without offset.

11.9 Smartphones and tablet screens collapse

It may not be displayed correctly on older iOS models, Android models, Microsoft's IE and EDGE browsers.　Please update your browser software.

11.10　Do you support Loconet?

Loconet is a technology of Digitrax Corporation, so we do not support it.　There will be no support schedule in the future.

12 Operation confirmed decoders

There are reports that cooperation among volunteers has been able to operate on the following decoders and locomotives.　Furthermore, regardless of whether this list is posted or not, there is no guarantee of motion perfectly.　There are also cases that do not move due to wearing state or compatibility with the locomotive.
Also, if the manufacturer does not declare DCC compliant, we cannot support it enough, so we may not be able to respond as a result.

Manufacture name	Decoder product · locomotive name	Remarks
Nucky	Nucky One Coin Decoder 3, 4, Japanese Type Signal	
Nagoden	MP3 decoders V4, V5, R6n	
Nagasue(NGDCC)	DE29X2, DE32sx, DA7ExtIn, d51k	
minitrix	16251 other	
Fleischmann	715290 other	
ZIMO	Unknown decoder (with Roco)	
Uhlenbrock	Unknown decoder (with PIKO)	
ESU	LokSoundV4,	
cT Elektronik	DCX77z	
digitraxx	EM13, DS51K1	
Lenz	Unknown decoder	
Soundtraxx	TSUNAMI、ECONAMI、DSX	
LGB	DCC compatible locomotive	
Temple	Quantum Sound Series	Declare non DCC compliant.
Märklin	Märklin Motorola 1 and 2 compatible locomotive, Delta	Märklin mfx and mfx+ are not supported yet.
Viessmann	2691 locomotive	
hornby	L4928 Locomotive decoder	
QSI Solutions	Quantum Sound System produced by Tenshodo Japan	
Desktop Station	DSturnout, DSservo, DSwatch	
PIKO	Smart Decoder 4.1	
MTH	#80-2153-1 (GG-1 Electric)	

Revision history

Version	Changes	Date
0.1	Create New	2018-10-23

Trademark etc.

・FlashAir is a registered trademark of Toshiba Memory Corporation.

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