MANUAL V1.0

DS13 Handheld Programmer

Create Reliability, Dala dala

DALA Technology Co., Ltd.

www.dalacontroller.com

⚠ Read Instructions Carefully!

Specifications are subject to change without notice.

CONTENTS

1　OVERVIEW

Debugging System 13 (DS13) handheld programmer provides powerful and portable programming and troubleshooting for DALA controllers by connecting in one of two ways, specific to the device:　Either through a Controller Area Network (CAN), or directly via the device's serial port. Cables specific to the connection are supplied with the DS13. Using DS13 can read/write controller parameters, monitor data, diagnostic faults and upgrade firmware.

Parameter settings can be conveniently cloned from one master DS13 to multiple slave DS13 via USB connection.

Figure 1.1　DS13 Handheld Programmer

This manual covers the operation for the serial-connected programmable controllers, Gauges and Control systems (devices) operate in a similar fashion.

1.1　HOW TO USE THIS MANUAL

This manual describes how to use the DS13 to accomplish following tasks:

- Access and change parameter settings.

- Diagnostic.

- Save, transfer, and clone parameter settings between devices and DS13.

- Update controller firmware/software and DS13 software.

The first 3 chapters describe the DS13 basic operation and the applications on the Main Screen. The subsequent chapters explain how to use a specific application (app). Appendix A summarizes the files associated with the DS13. Appendix B lists specifications of DS13.

New users are suggested to read this manual to train themselves on programming and troubleshooting DALA controllers by using DS13.

⚠️ **WARNING！** The controller can affect speed, acceleration, deceleration, dynamic

stability, and braking. If the controller is programmed incorrectly or exceed the safety limits as determined by the vehicle manufacturer, it can create a dangerous situation. Only the OEM or an authorized service agent or dealer should program the control system**.**

2　　DS13 OPERATION

This chapter describes connection ports, functions and operation of DS13.

2.1　CONNECTION

DS13 has three connectors: DB9 for communication with controller, USB Type-C for communication with computer/mobile phone, USB Type-A for data transfer via USB flash. The DS13 has a battery compartment on back side for battery powering.
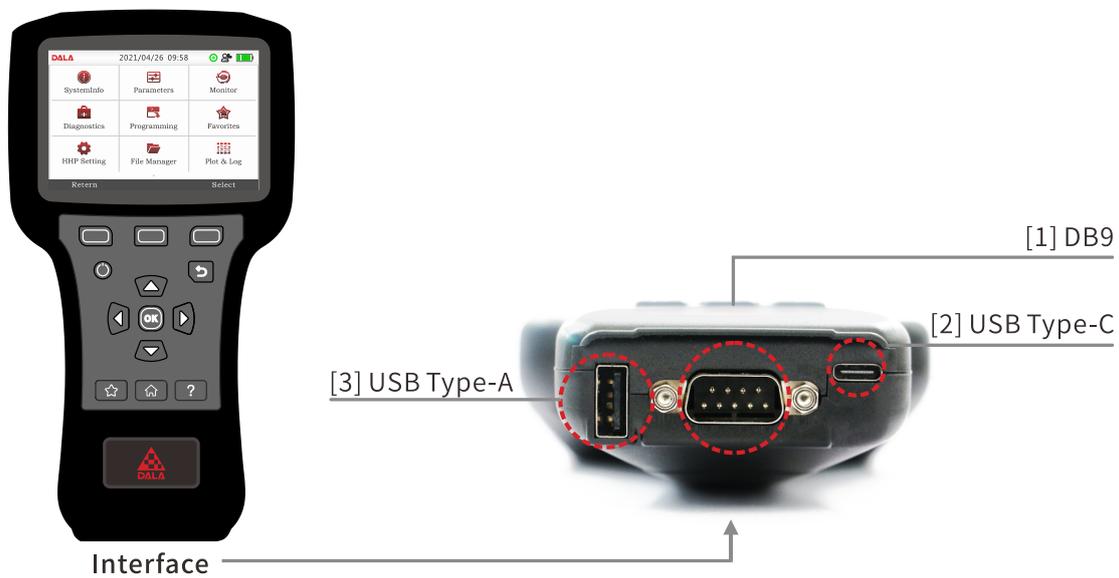
Figure 2.1 DS13 Connectors

2.1.1　DB9 CONNECTOR

DB9 connector contains serial port, CAN port and power port, cables are supplied with DS13.

⚠️　　Note：Cables supplied with DS13 is 2*2P 4.2mm Molex 5557.

2.1.2　USB Type-C

The USB Type-C is for accomplishing the following tasks：

1.　Any android smart phone supports OTG can be connected to DS13 via the supplied Type-C cable as

an external storage device. Once the smart phone is connected successful, Parameter setting files (.dala file), Updating files (.SC file) or other files can be transferred to / from the DS13 internal memory.
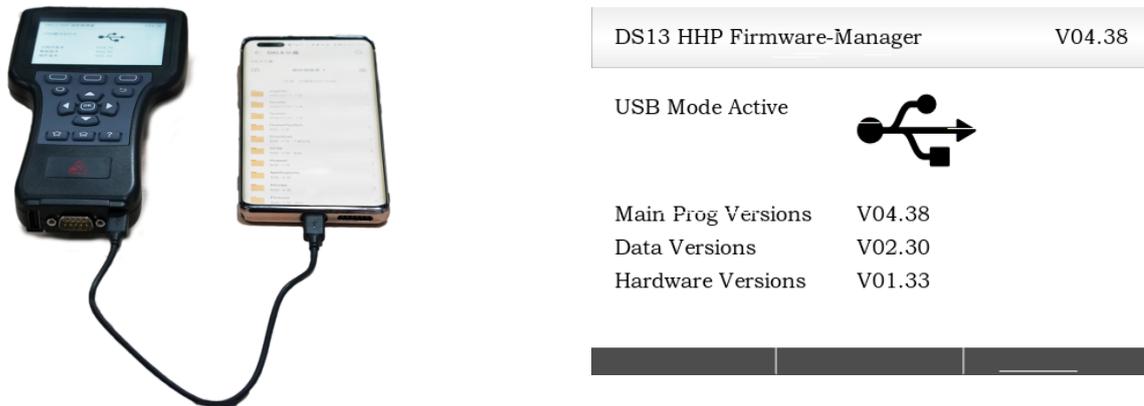
Figure 2.2　DS13 connect to Android smart phone

2. The DS13 can be connected to computer via USB Type-C cable. Now DS13 works as a portable storage device, files can be transferred to / from the DS13 internal memory.
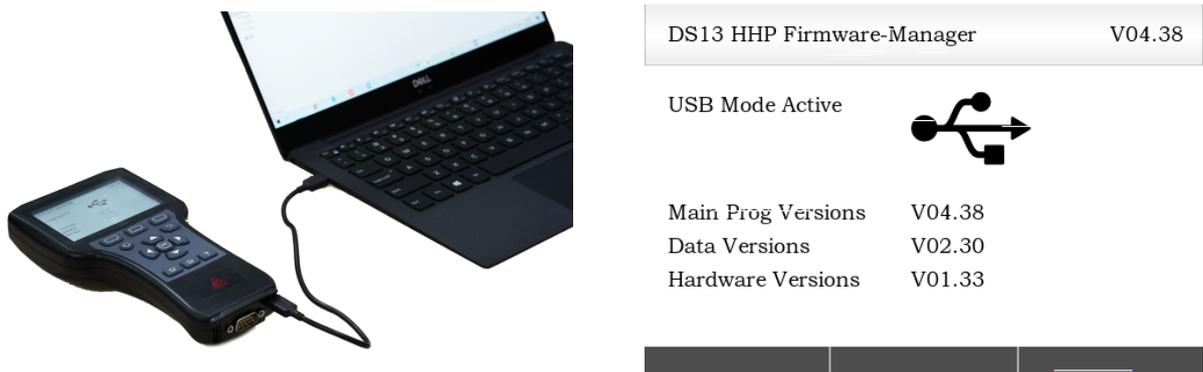
Figure 2.3 DS13 connect to computer

3. The DS13 can work offline for example update firmware or check parameters (check .dala file) by connecting to portable charger or charging device via USB Type-C cable.

Figure 2.4 DS13 connect to charger

⚠️ Note：Internal memory of DS13 is 16MB, please delete files to release enough storage room using DS13 file manager or connecting DS13 to smart phone or computer for such operation.

2.1.3 USB Type-A

When USB flash is connected to DS13, the storage icon will be displayed on the top state bar. Transfer ".dala" files or ".SC" files from USB flash to DALA controller or clone parameters setting file from DALA controller. (See **chapter 8.2,** save .dala file). Also screenshot files (.bmp format) can be saved directly to USB flash. (See **chapter 14,** taking screenshots).

The DS13 file manager can help to manage files in USB flash, like Copy, Paste, Delete, Drag & Drop (See **chapter 11,** File Manager), but cannot manage files between USB flash and internal memory.
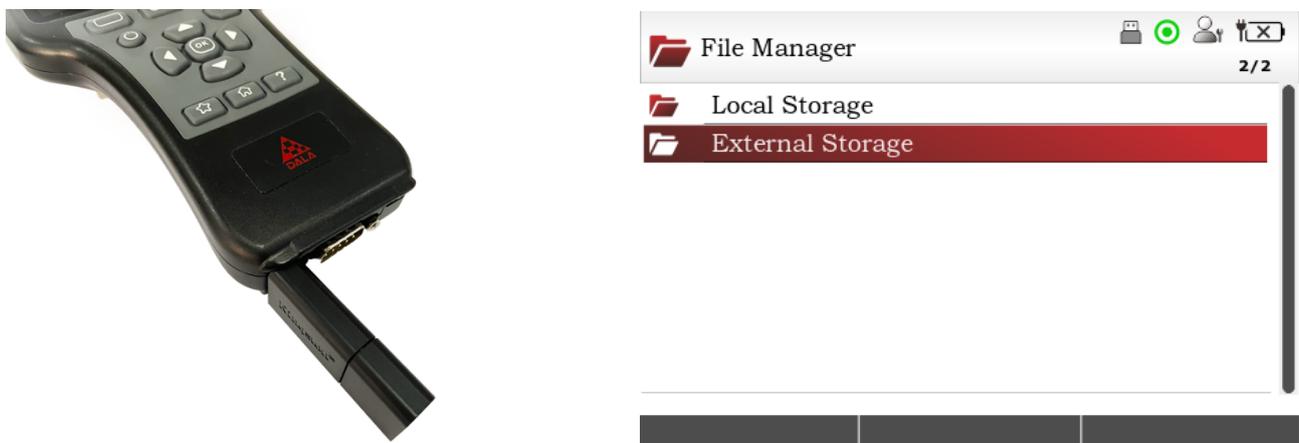
Figure 2.5 External Storage

⚠ Note：

1. While DS13 is powered by DALA controller, if the controller has low load capacity, DS13 will auto switch to low power consumption mode. In such case, DS13 will stop detecting USB flash, and storage icon will no longer displayed on top bar.

2. Required specification of USB flash on DS13：Storage: ≤32GB, Format: FAT32.
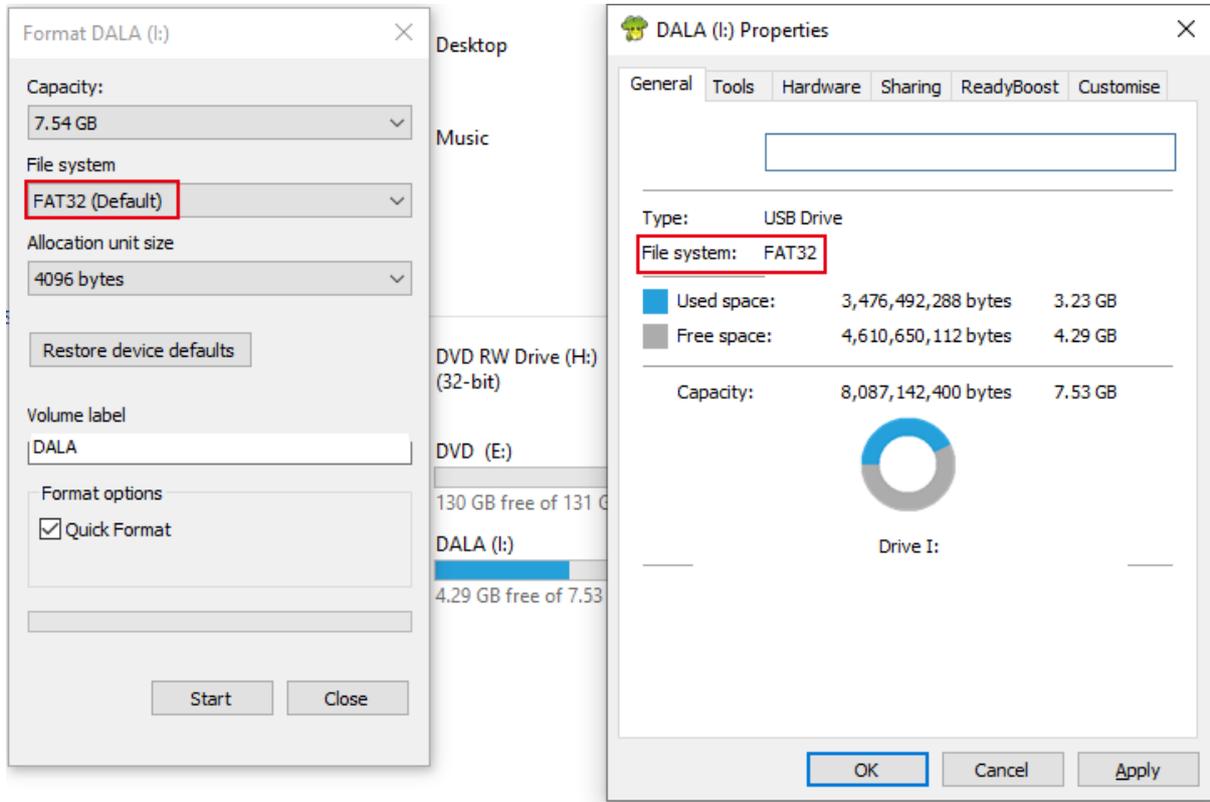
Figure 2.6　Required specification of USB flash

2.1.4　BATTERIES CONNECTOR

A compartment on the back holds two AA sized batteries which allows the DS13 when working offline. Although the DS13 can be powered by batteries when connected to a controller, operations such as data logging may quickly deplete the batteries. Battery life will be extended by powering the DS13 from the connected controller or via USB Type-C.

Figure 2.7 DS13 battery compartment

⚠️ Note：While DS13 is updating its software and powered by batteries, must be make sure the batteries have enough power. During the updating, if battery dead will case system power-off, updating fail, software lost, and DS13 malfunctional. It is strongly suggested to use USB Type-C or controller to power DS13 when updating. See **Chapter 16**, updating DS13 software.

2.2 POWER ON THE DS13

Connect the DS13 into the controller via the controller's serial port. If the controller is on, the DS13 will automatically power-up and display the initial screen.

Figure 2.8 DS13 initial screen

Connect via serial port, DS13 will automatic match DALA controller's baud rate, user don't need to click "Serial" key. Connect through CAN port, user need to click "CAN" key to trigger DS13 matching baud rate from controller. Once baud rate matched, DS13 will automatically loading controller's system information and switch to main screen once system 100% loaded.

Figure 2.9   DS13 loading controller information
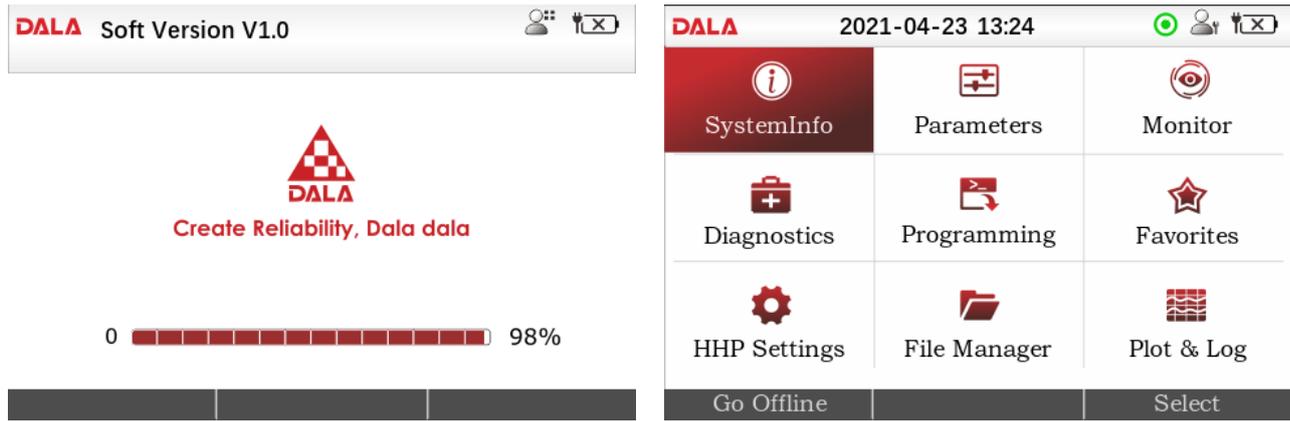
⚠ Note：

1. If a DALA controller hasn't connected to DS13 ever before or it is the first time connect to DS13 after controller firmware updated, the loading time may be long because there is no cache file in DS13 internal memory. When DS13 saved information from controller in a cache file, connection will be faster as the cache file is available. If the cache file is deleted, the next connection time will be long as DS13 has to repeat load controller information. (See **Chapter 10.12**, delete cache file)

2. When DS13 is powered from the controller, if the power is lost while connected, the DS13 will turn off even if it has batteries installed.

3. When the DS13 has the batteries installed and is not connected to a controller, pressing the power key "⬤" will turn on the DS13. If DS13 is connected to and powered from a controller, DS13 will continued be powered by batteries, to switch the powering from controller, need to restart DS13.

4. Powered by portable charger or adapter, DS13 will automatically powered on, and keep getting powered from charger/adapter even DS13 has connected to a controller. But when remove USB Type-C from DS13, its powering will automatically switch to controller.

2.3   DISPLAY FORMAT

The high-resolution clarity of the color LCD screen allows a wealth of information to be displayed at once. On the top of screen is state bar, that displays date and time, USB flash connection icon, screenshot icon, connection state, access level icon, etc.
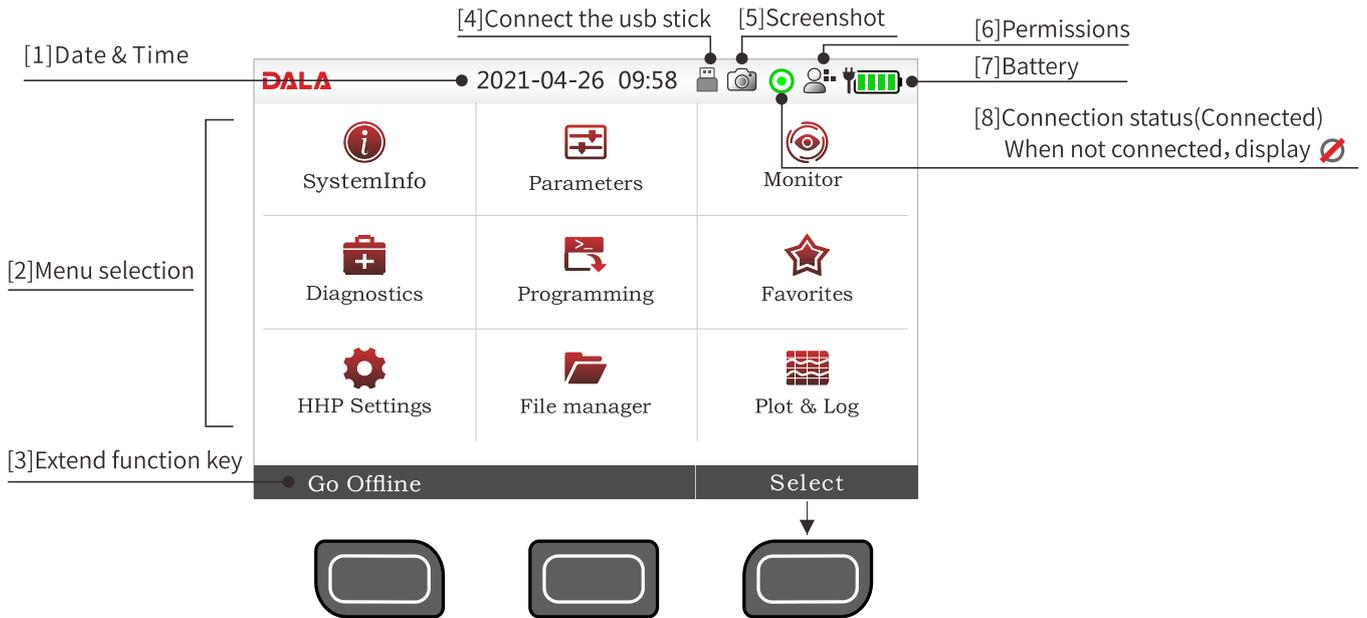
Figure 2.9 Display Format

On the bottom of screen supports maximum three softkeys. To perform an action indicated in the softkey text, press the blank softkey located directly below it. which provides same function as programmable keys.

The initial screen has two softkeys.

Pressing the "Select" softkey will open the highlighted Parameter app.

Pressing the "Offline" softkey will disconnect to controller, DS13 switch to Offline mode and goes back to initial screen, user can select again which mode connect to controller.

2.4 ACCESS LEVEL

The DS13 provides five access levels: OEM, Dealer, Service provider, User and Visitor. Different access levels can access to levels below it, but not above it. (See **Chapter 10.1**, access level)
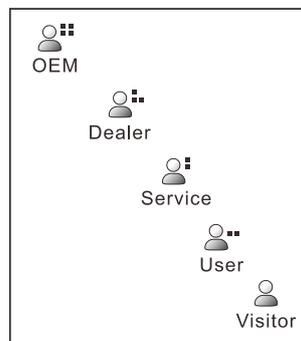
Figure 2.10   DS13 ACCESS LEVEL

2.5　KEY FUNCTIONS

Figure 2.11　DS13 Key Fuctions

The push button keys on DS13's keypad allow rapid navigation through the apps.

Keys	Icons	Description
Softkeys		These three keys function is context-specific, their function is shown directly above them on the LCD screen. The symbol ">" indicates more options; pressing the softkey under the ">" will scroll to another set of options.
Arrow keys and OK key		Use these four keys to scroll up-and-down and right-and-left within the display screen. In the "Parameter setting" app, "right key" enter the selected menu and "left key" back to previous menu.
Power		The power key turns DS13 on or off. If the controller's serial connection is powered, the DS13 will turn on automatically when connected.
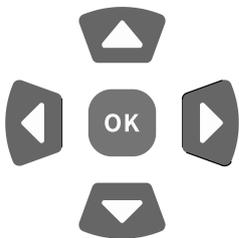
		Press and hold the power key for 2 seconds, a pop-up message will ask you to confirm whether turn off DS13.
		When DS13 is powered via USB Type-C, press power key will have no effect. Plug/Unplug USB Type-C to turn DS13 on or off.
Return		Press Back key will go back to previous menu or screen.
Favorites		Press favorites key under any screen will bring up the favorites app. See **chapter 9**, Favorites.
Screenshots		Press both the Power Key and the left softkey to save the present image of the LCD display. Image format: .bmp. These are called screenshots. See **Chapter 14** for further details about screenshots.
Main Screen		Pressing this key will return to the Main Screen from any location. Also use this key to navigate app within the main screen.
Help		This key is used to display context-specific Help text.

3 MAIN SCREEN AND APPS ORGANIZATION

The Main Screen contains 9 apps that are each identified by a specific icon: System Info, Parameters, Monitor, Diagnostics, Programming, Favorites, DS13 Setting, File Manager, Plot & Log.

Figure 3.1   DS13 Main Screen

3.1   APP STRUCTURE

Apps contain multiple levels, use right key to enter the selected menu, use the left key to navigate back to the previous screen.

When any of the app's top-level menus are selected, the name of the app is displayed adjacent to its icon. When navigating through a hierarchical menu, the text at the top of the screen expands to show the path taken. Likewise, the item's relative position on the screen or in a menu is shown in the window. If characters in the text exceeds display limit, DS13 will display "…". The top, or first item will indicate "1 of X" while the bottom, or last item will indicate "X of X" on the screen.

[1]Current Path

Parameter
1/14

[2]1of 14(1/14) , detail screens

📁 Drive
📁 Throttle
📁 Current
📁 Inhibit
📁 Brake
📁 Horn
📁 Motor
📁 BDI

Add to

Figure 3.2 Menu Levels

[1]current path

Parameter

└ Brake Light

Parameter/Brake
1/4

✎ Delay   0.1 S
✎ Fault Check   1
✎ Hold Voltge   10 V
✎ Brake light   1

Scrollber

Add to
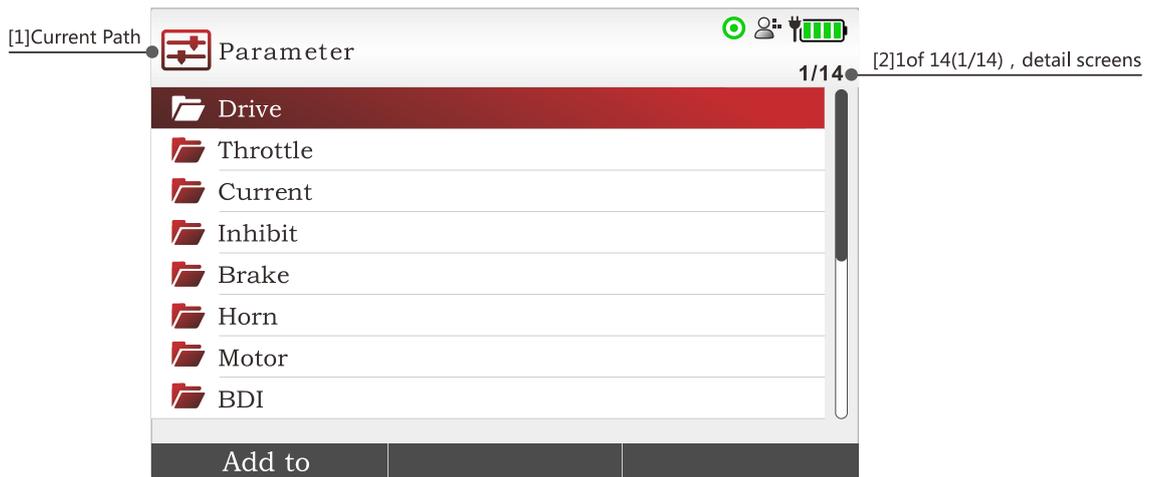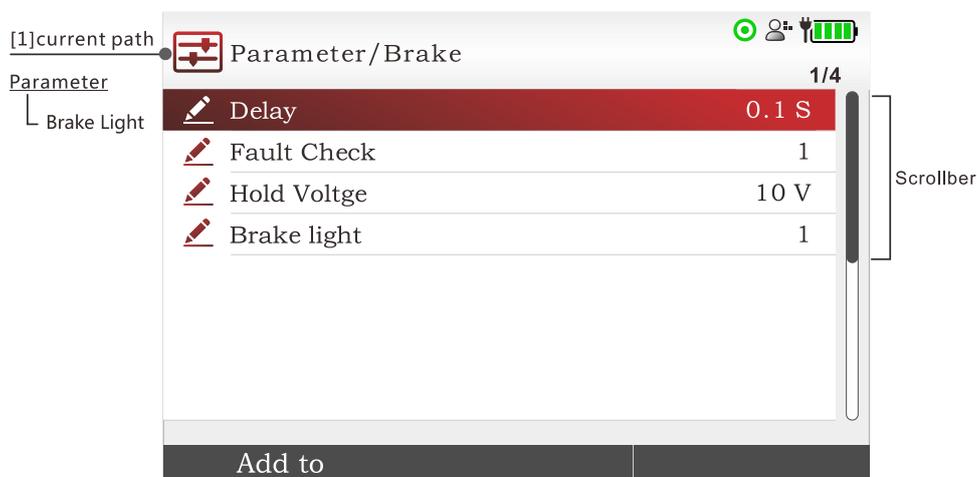
Figure 3.3 Scroll Bar

Press Main Screen key [🏠] will quit the present app. When you enter the specific app again, and the "Remember Last Screen" is off, then will display the default first screen of the app; if the "Remember Last Screen" is on, then will go to the last screen that was used in the app.

⚠️　Note：If the DS13 is turned off (e.g., the controller is key-cycled) the "last-place-memory" is lost. Each power-on session begins the Remember Last View anew, even if the setting is "On".

3.2　APP ITEMS

Each item in the applications is represented by one of the following icons.

ICON	Description
🅘	These are read-only items, providing detailed information.
📁	Folders indicate menus or submenus. Pressing the right-arrow key opens

the folder.

	Items in this folder can be edited. Pressing OK to edit, use the up-arrow and down-arrow keys to change the values.
	These items perform a procedure as indicated by the item's name. Pressing the "right-arrow" key will either complete the procedure.
	This item contains files in file manager.
	These are read-only parameters, not editable.

3.3   THE NINE APPLICATIONS

The following 9 applications (apps) are available for DALA programmable controllers. Each application will be fully described in the subsequent chapters.

ICON	NAME	DESCRIPTION
	System Info	Chapter 4
	Parameters	Chapter 5
	Monitor	Chapter 6
	Diagnostics	Chapter 7
	Programming	Chapter 8
	Favorites	Chapter 9
	DS13 Setting	Chapter 10
	File Manager	Chapter 11
	Plot & Log	Chapter 12

4　SYSTEM INFO

Figure 4.1 System Info

After the DS13 loads the controller information, the Main Screen is displayed with the System Info app highlighted. The System Info shows the controller-specific information, i.e.: Controller model number, Serial number, manufacture date, and its software/firmware/hardware version number.

Press "System Info" icon in main screen, and press "Selected" or "OK" key to enter the specific app. To return to the main screen, press either the Main Screen key, Return key or Left-arrow key.
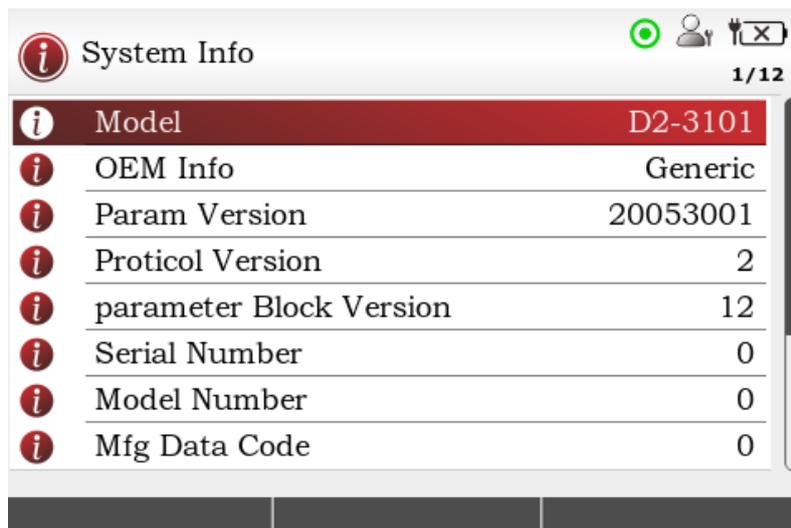

Figure 4.2 System Info

5　PARAMETERS

Figure 5.1 Parameters

The Parameters app covers all the items that can be accessed and edited with Parameters. It is recommended that the controller manual be consulted for explanations of the read/write and read only variables viewable within Parameters. The parameters shown depend on the controller model, and on the access level of the DS13. Not all controllers will have the same parameter menus pictured here, and some controllers may not operate as describe in this chapter.

qqIn the main screen, highlight the Parameters icon and press the "Select" softkey or OK key to open the app. Press the Main Screen key, Return key or Left-arrow key to return to the main screen.

⚠️　Note：Be aware that as parameter settings are changed immediately, the new value immediately replaces the earlier value. The changes may affect vehicle speed, accelerate, decelerate, braking etc. And incorrect changes may cause safety issue, only vehicle manufacturer, authorized dealer, service provider are allowed to change parameters.

5.1　PARAMETER STRUCTURE

When any of the app's top-level menus are selected, the name of the app is displayed adjacent to its icon. When navigating through a hierarchical menu, the text at the top of the screen expands to show the path taken. Likewise, the item's relative position on the screen or in a menu is shown in the window. If characters in the text exceeds display limit, DS13 will display"…". The top, or first item will indicate "1

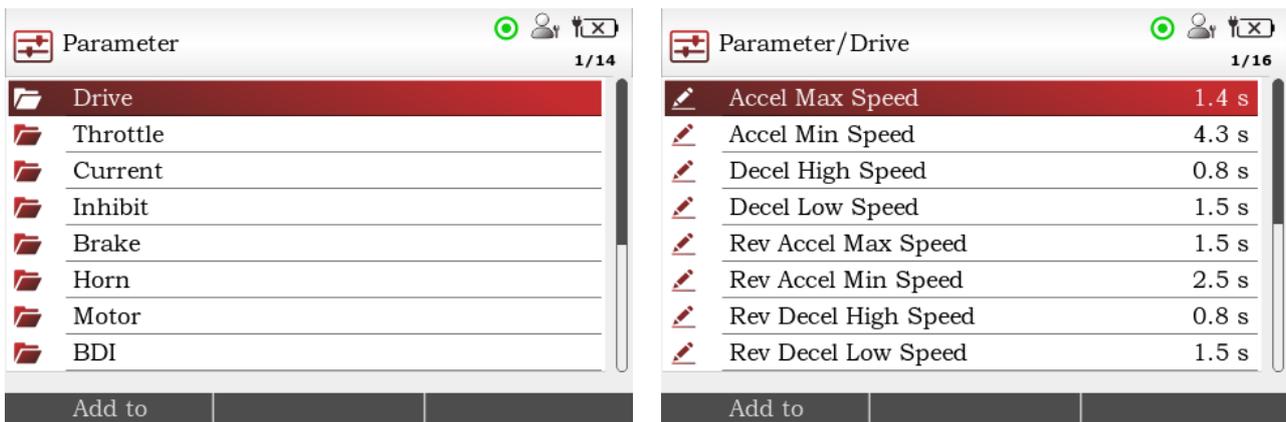of X" while the bottom, or last item will indicate "X of X" on the screen.

Figure 5.2   "Driver" menu of controller

✎ ：Editable values

📁 ： Folders indicate menus or submenus.

📁 If exiting an app using the main screen key (🏠) and later returning to the same app, the app will open to a location that depends on the "Remember Last View" setting in the DS13 Settings app. If the "Remember Last View" setting is "Off ", the app opens at the top-level. If the setting is "On", the app opens to the most recently used location.

⚠ Note：If the DS13 is turned off (e.g., the controller is key-cycled) the "last-place-memory" is lost. Each power-on session begins the Remember Last View anew, even if the setting is "On".

5.2   ADJUSTING/EDITING PARAMETERS

Within Parameters, if the menu contains more than the 8 items shown on the screen, a scrollbar appears at the right edge of the screen. Use the down or up arrows to navigate between parameters or submenus.

Press OK key to start editing the parameters. Use the up or down keys to change the parameter's value. Changes are immediate, double check the changes is strongly suggested.

Figure 5.3 Adjusting/Editing Parameters

The "×10" or "×100" softkey changes the parameter's step-size, which permits rapid value changes in increments of ten or a hundred times the parameter's step-size. When press either "×10" or "×100", the specific softkey's back color changes to Red means affected, press the key again will return to default step-size and the key's back color goes grey.

For example, as shown in figure 5.3, Using the "×10" softkey will change the Forward Max parameter setting from 8.0s to 7.0s, using the "x100" will change the setting from 8.0s to 0.0s (Minimum setting is 0.0s).

Properly using the "x10" or "x100" in a large range setting gives a better efficiency with programming.

When highlighted an item in the app, use right arrow key will open to a detail screen which displays the names of parameter, present value and allowed range. Use "x10" or "x100" with up or down arrow keys to change values, changes are immediately affected. Press "OK" key, left arrow key or return key to return to last menu.
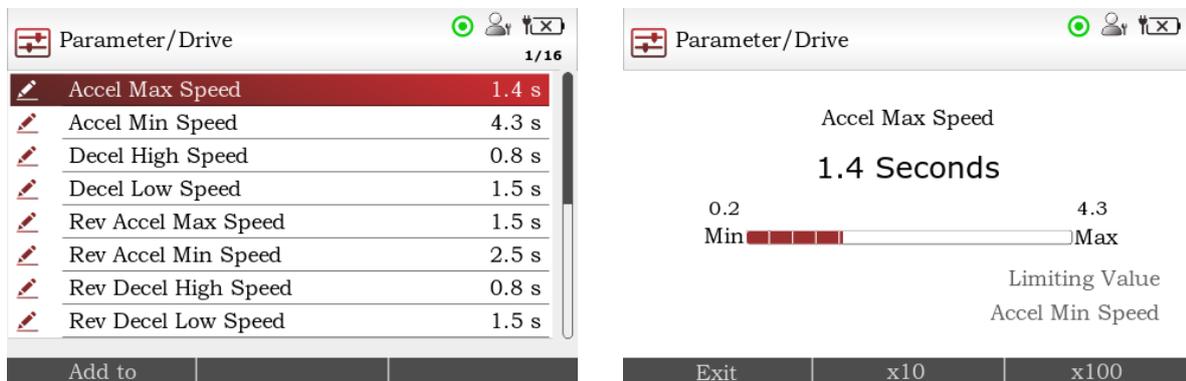

Figure 5.4 Parameter Setting

5.3　SOFTKEYS

Add to		
Cancel	Add	>>
New Folder	Finish	>>
Delete		>>
Move up	Move Down	>>

Figure 5.5 Softkeys

The "Add to" softkey opens a selection screen for choosing to "Add" the item to Favorites, Plot, or Log. See **chapter 9,** Favorites, and **chapter 12**, Plot & log. Folders can be added to Favorites only.
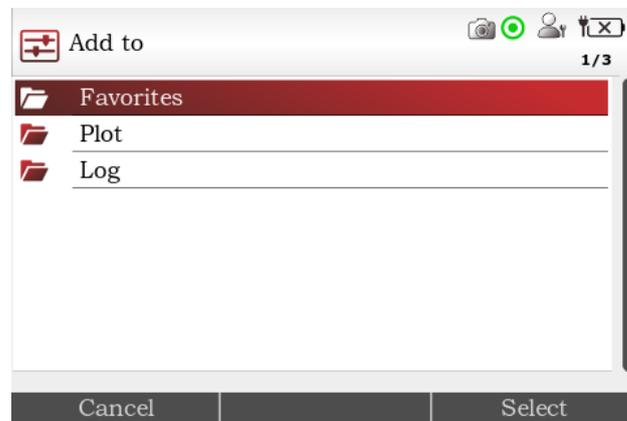
Add to

Figure 5.6 Add To

Select	Highlight the selected items, e.g.: favorites, plot or log.
Add	Add item to the selected location.
Finish	Completes the process and returns the screen to the original screen.
Cancel	Use the "Cancel" softkey to abort the "Add to" process.
Delete	Use the "Delete" softkey to remove items added to Favorites, Plot, or Log. See **Chapter 9**, Favorites, and **Chapter 12**, Plot & Log, for deleting, arranging, renaming, or creating new folders for items added to these locations.
Up	When item added to "Favorites", "Plot" or "Log", use the Up or Down key to change the added item's displayed location. See **Chapter 9**, Favorites, and

Down	**Chapter 12**, Plot & Log.
New Folder	Creating new folders for items added to these locations. See **Chapter 9**, Favorites, and **Chapter 12**, Plot & Log.

6 　 DATA MONITOR

Figure 6.1 Monitor

The Monitor menu provides real-time data of the monitor variables. It is recommended that the controller manual be consulted for explanations. Not all controllers have same items in the monitor menu, subject to controllers' model and DS13 access levels.

In the main screen, highlight the Monitor icon and press the "Select" softkey or OK key to open the app. Use Main Screen key, Return key or left arrow key to turn to main screen.

The Monitor app is useful during vehicle or system setup, testing, and diagnostic troubleshooting. Monitor variables can be place in the Favorites, Plot, and Log applications using the "Add to" softkey. See **chapter 5.3**, Softekeys.
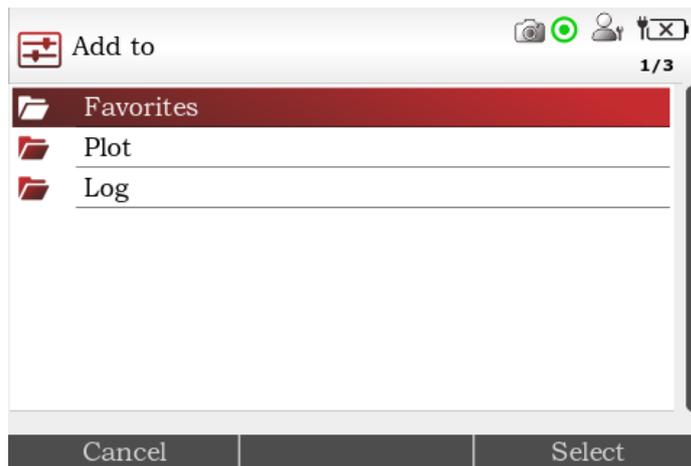
Figure 6.2 Monitor Add To

As the parameters app, the Monitor's screen displays the hierarchical menu path of a highlighted item. It also indicates the highlighted-item's position within its menu using the "x of x" format. Refer to the Parameters app, Chapter 5

Highlighting a monitor variable and pressing the right-arrow key will open an expanded screen which indicates the present value of that variable lies within its range. Press OK key cannot enter and edit the selected value, because values in monitor app is read only.

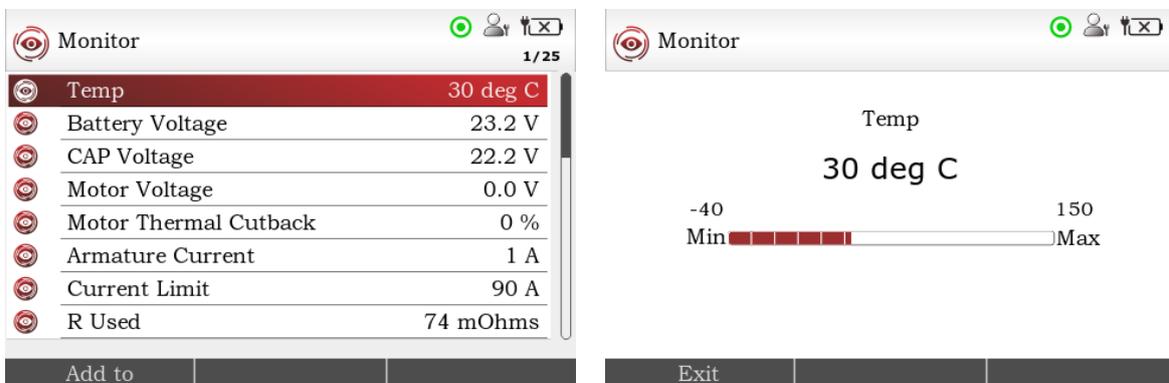Monitor app supports "Remember Last View", see **chapter 5**, parameter setting.

Figure 6.3 Monitor App

6.1 SOFTKEYS IN MONITOR

Figure 6.4 Softkeys in monitor

"Add to" is available for each monitored variable. This opens a selection screen for choosing to add the variable to Favorites, Plot, or Log. See **chapter 5.3**, softkeys.

7   DIAGNOSTICS

Figure 7.1 Diagnostics

The Diagnostics app contains two folders: Present Errors and Fault History.

Present Errors reads all existing faults, if controller power off, displayed errors may clear.

Fault history lists all the faults encountered since the Fault History was last cleared.

Diagnostics app reads data from controller memory, some controller may not save error information into memory unit, may not list fault history.

Select Diagnostic app in Main Screen, press "select" or OK key to enter the app. Press Main Screen, Return or Left arrow key to return to main screen.。
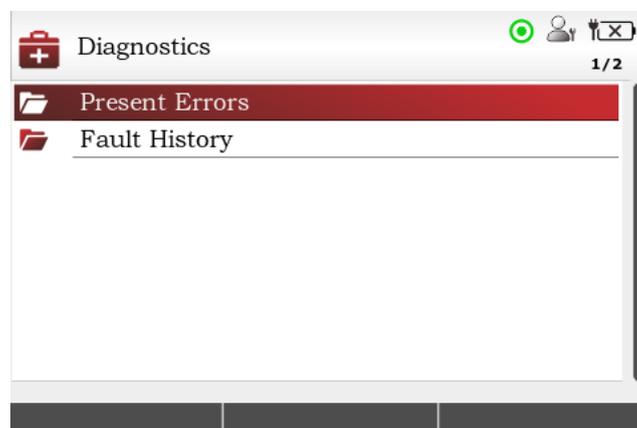

Figure 7.2 Present Errors and Fault History Folders

7.1 PRESENT ERRORS

All existing faults are listed here, in chronological order. An item in this folder can only be removed by remedying the fault. As long as the fault exists, it will be included in the Present Errors folder.
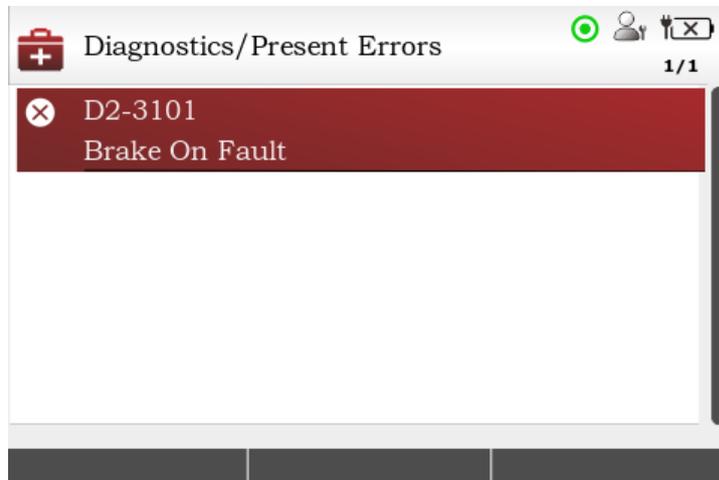
Figure 7.3 Present Errors

The "1/3" in the upper right corner of the screen indicates that the HPD/Sequencing Fault is the first of three present faults. The model number of the (faulted) connected controller is the first line of listed faults.

7.2 FAULT HISTORY

This folder lists all the faults encountered since the Fault History was last cleared. Clearing the contents of this folder to allow a fresh Fault History to be started.
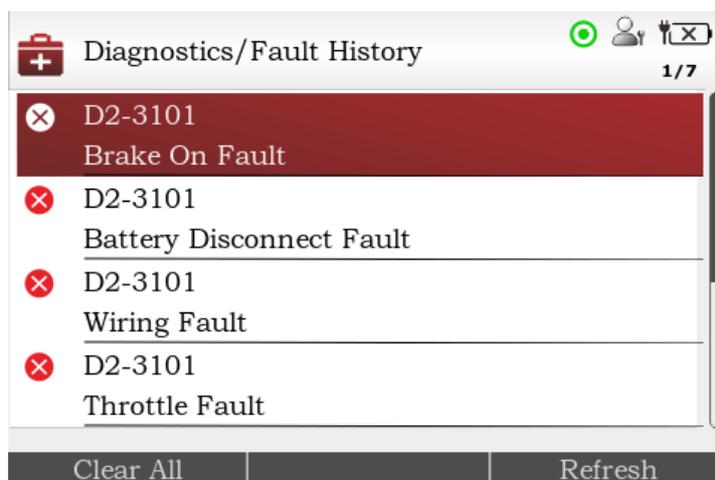

Figure 7.4 Fault History

7.3 SOFTKEYS IN DIAGNOSTICS

Clear		Refresh

Figure 7.5 Softkeys in Fault History

"Clear All" is used to empty the Fault History folder. This softkey appears only when the Fault History folder (or one of the faults within that folder) is highlighted. Individual or selective faults cannot be cleared.

"Refresh" is used to update history faults, as faults record is not real-time updated in the folder, press "refresh" key to get the latest faults list. This softkey appears only when the Fault History folder (or one of the faults within that folder) is highlighted. Press the Refresh key, a pop-up window will appear as "Refreshing fault history…", the window close when refresh done, and fault history has been updated.

8　PROGRAMMING

Figure 8.1 Programming

The Programming root menu contains the "Save .dala File", "Restore .dala File" and "Upgrade Firmwire" options. Press OK key directly to enter the selected item.

Figure 8.2 Items in Programming App

The controller parameters and their values can be obtained and saved using the "Save .dala File" option. File can be storage in DS13 local memory (16MB) and send to computer or mobile phone through USB cable, or can be saved directly to USB flash.

"Restore .dala file" will restore the parameter values (.dala file) in a controller. The parameter values

(.dala file) can be sent to DS13 local memory (16MB) or saved directly in USB flash.

"Firmware Update" will update controller's firmware (.SC file), also can be storage in DS13 local memory or a USB flash.

⚠️　Note：The parameter values ".dala file" storage in local memory or USB flash can be read offline using DS13. See **chapter 15**, working offline.

In main screen, select Programming app and use "select" or OK key to open the app. Press Main Screen, Return or left arrow key to turn to main screen.

8.1　SAVE .dala FILE

The controller parameters and their values can be obtained and saved using the "Save .dala File" option. The process saves all the parameters, even those not accessible at the user's particular DS13 access level. Whenever parameter values are changed using the Parameters app, each new value overwrites its previous value, so saving a .dala file will always capture the latest parameter values.

Pressing the "save .dala file" softkey will confirm the controller-model from which the data will be saved. In some applications, several controllers can be listed. In these cases, highlight the desired controller.

After pressing "OK" to proceed in saving a .dala file, the DS13 will open a screen to select the location to save the file. Select either the DS13 Internal memory (16MB) or external USB flash. If no USB flash is detected, here will display internal memory only. (Hereafter the same process as save files in either internal memory or USB flash.)
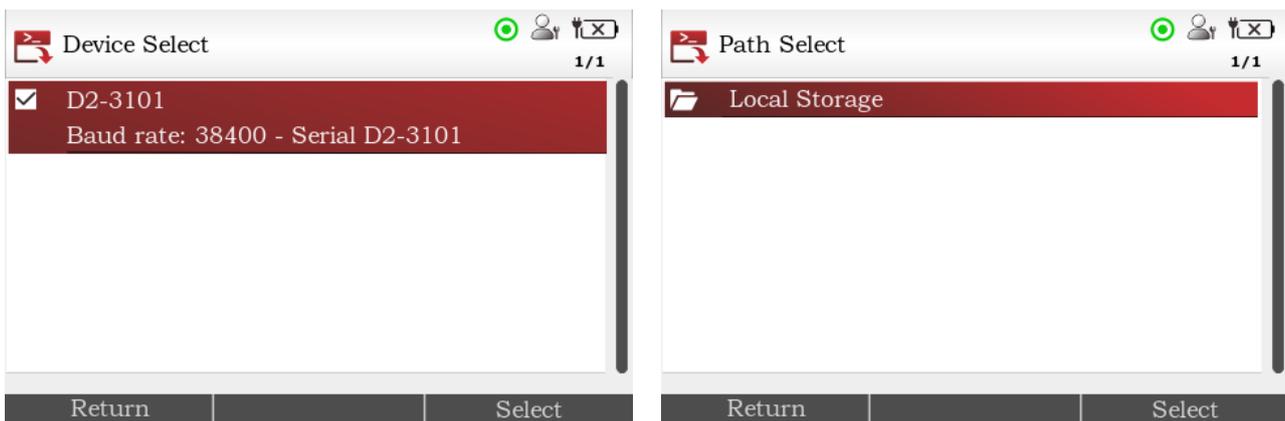

Figure 8.3 Select controller and location save to

Press "OK" to confirm the location to save, press "OK" again or use right arrow key will save files in the highlighted folder.
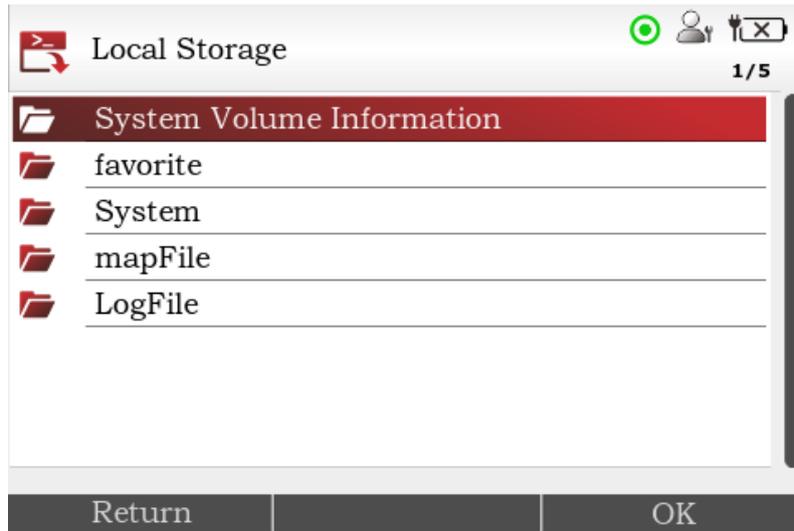
Figure 8.4 Internal Memory

⚠️ Note：DS13 file system supports English only, if name of memory unit or name of path contains other language will be displayed as "??", which not affect reading files.

Press "Select" key and confirm in the window pop-up as "confirm to save .dala file" will pop-up a soft keyboard to name the target .dala file. DS13 default name file as "dalafile + date", click "finish" to process next or rename the file use direction key and OK key. See **chapter 13**, keyboard. Cancel the default naming can be done in system settings, will manually name files instead. See **chapter 10,** system setting.
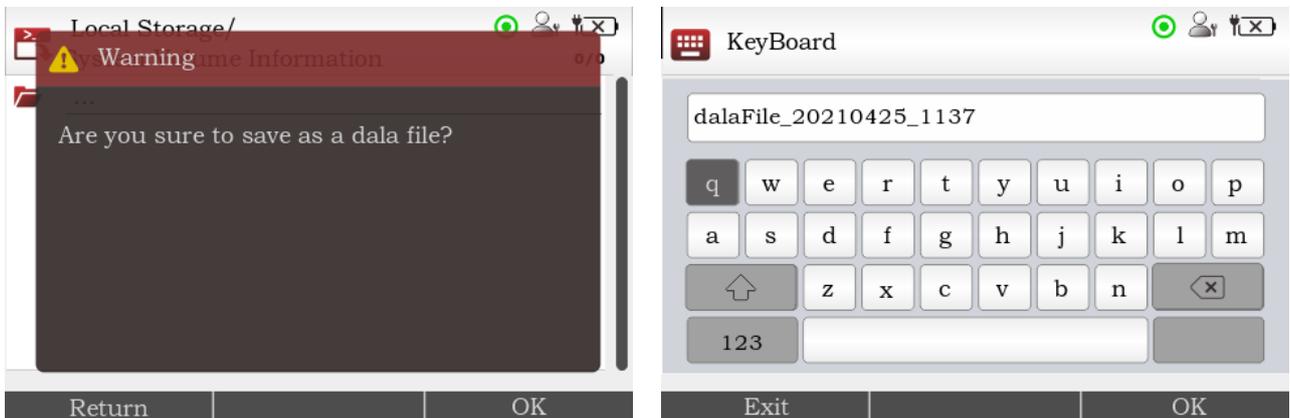

Figure 8.5 Naming .dala file

⚠️ Note：Save as .dala file must be named or a pop-up warning will remind.

After completing the .dala file location and naming selections, select the respective "OK" softkey to begin the saving process. New file can be found in file manager. See **chapter 11**, file manager.
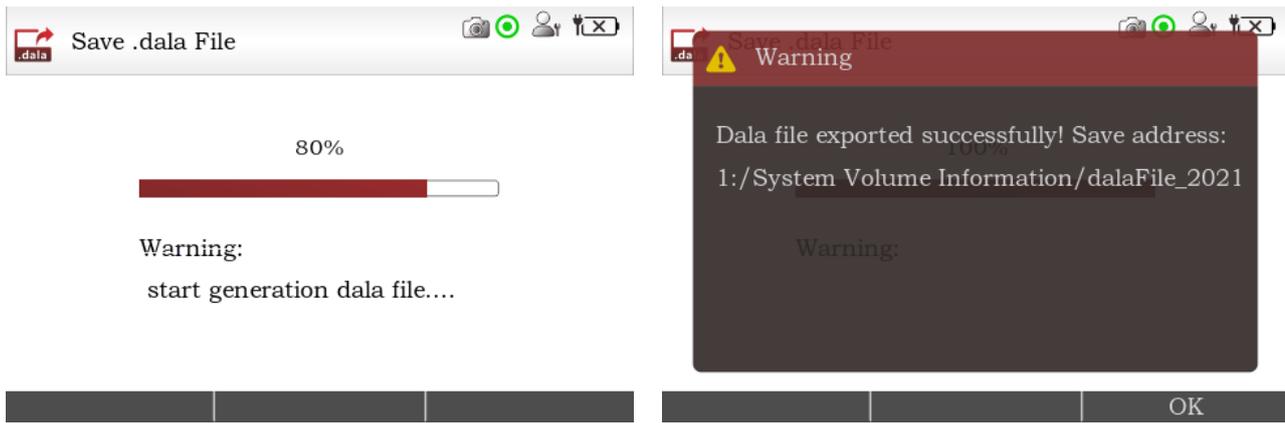
Figure 8.6 Saving Process

Connect DS13 to a computer or mobile phone via USB Type-C cable, DS13 will be detected as a portable storage unit. Use copy, cut, paste to transfer files. Internal memory of DS13 is 16MB, pay attention to the available storage room. Use file manager (See **chapter 11**, file manager) or connect to mobile phone or computer can delete files to release more storages.

8.2 RESTORE .DALA FILE

Use the "Restore .dala File" option to restore the parameter values in a controller with those in a .dala file. This restoration process replaces the target controller's parameter values with those in the .dala file. Its suggested to consult OEM, dealer or support engineer before restore .dala file.

⚠️ Note：The target controller must match the model name and the OS (operating system) parameter block version of the .dala file's source controller, otherwise may cause controller malfunction.

Pressing the "restore .dala file" softkey will confirm the controller-model which the data will be restored to. In some applications, several modules (controllers) can be listed. In these cases, highlight the desired module.
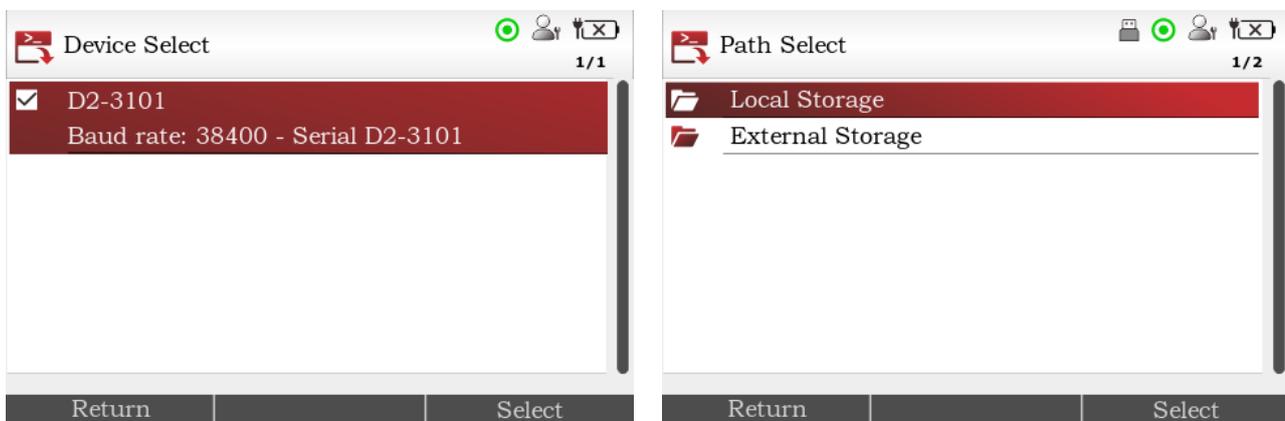

Figure 8.7   Select controller and location save to

After pressing "OK" to proceed in restoring a .dala file, the DS13 will open a screen to select the location

to restore the file. Select either the DS13 Internal memory (16MB) or external USB flash. If no USB flash is detected, here will display internal memory only. (Hereafter the same process as save files in either internal memory or USB flash.)

⚠️ Note：If restore from internal memory, connect DS13 to a computer or mobile phone through USB cable before process further. See **chapter 8.1**, Save .dala file.

Press OK or right arrow key to confirm restore location, select file by using direction keys and press "Select" will pop-up to confirm restoring file. Once process done, will pop-up "Restore success, please reboot device!". Reboot as advised to activate device with new .dala file.
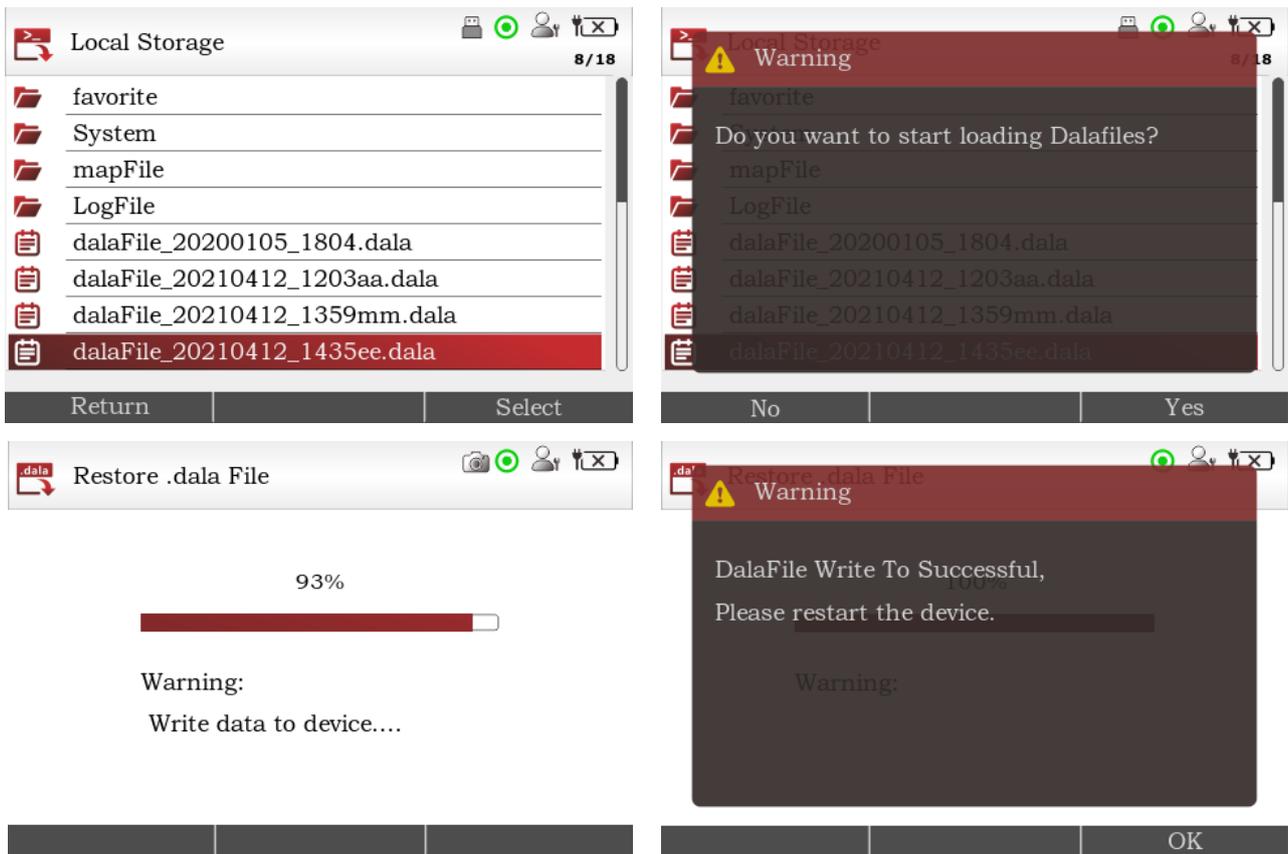
Figure 8.8   Restore .dala file

⚠️ Note：The restore process can take several minutes, during the time the controller must remain powered. The DS13 must remain connected to the controller during the update. If the restore process from USB flash, must remain the connection of USB flash. If the process disturbed by power off, communication disconnected, will cause controller parameter lost or error, has to redo the process until restore success.

8.3   FIRMWARE UPDATE

Using "Firmware update" to update controller firmware (.SC file). Select ".SC file" is same process as

"restore .dala file". See **chapter 8.2**, restore .dala file.

Select the target ".SC file" will pop-up message "Confirm to update", click "confirm" to process. After the target firmware have been successfully updated to controller, the DS13 pop-up message 'Firmware updating done, please restart device!' will appear. Key-cycle the controller to complete the process.
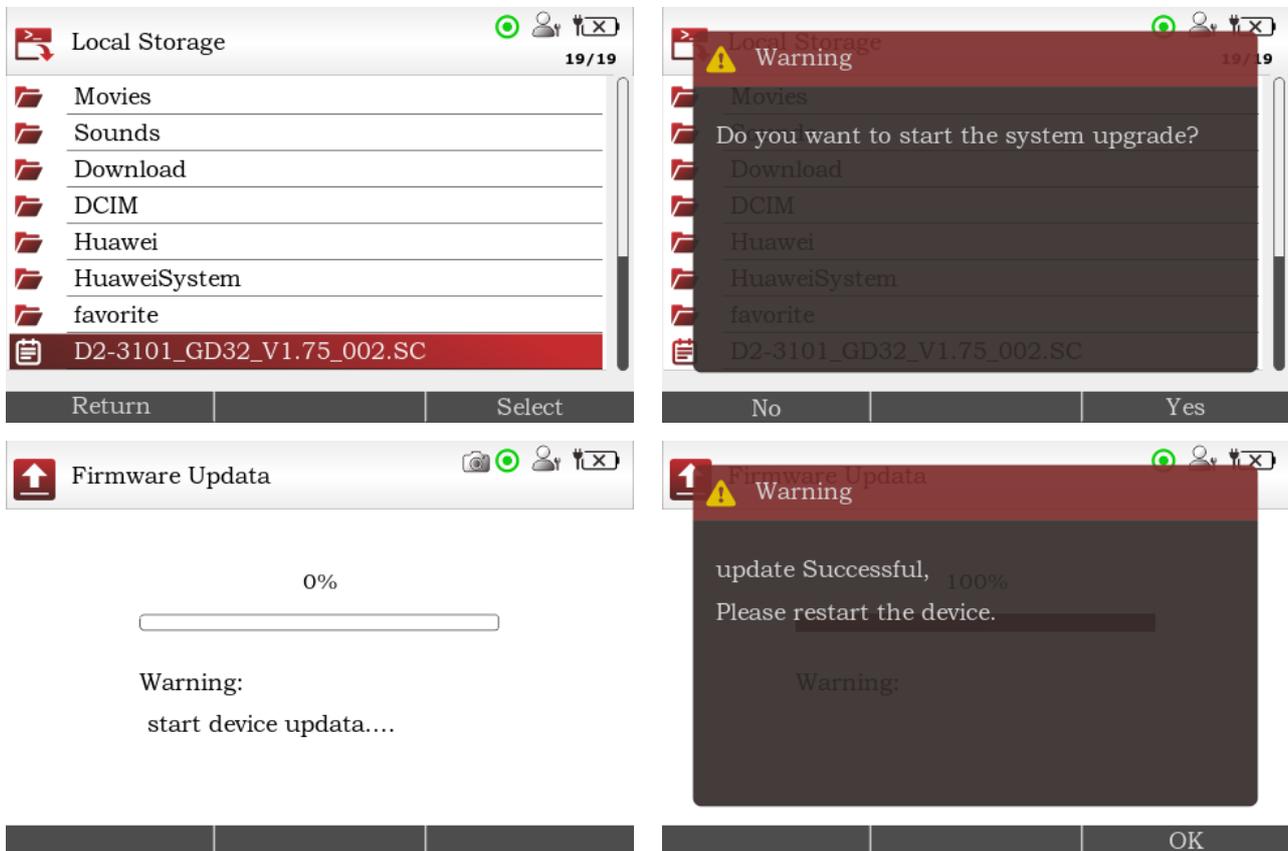
Figure 8.9 Firmware update

⚠️ Note：

1. System will not automatically check firmware ".SC file" match with controller model, it has to be manually checked. Unmatched firmware is restricted to update to controller, otherwise it will cause controller dead to use.

2. The update process can take several minutes, during the time the controller must remain powered and connected with DS13. If the update process from USB flash, must remain the connection. If the process disturbed by power off, communication disconnected, will cause controller dead to use.

In any case of failure as described above, please contact DALA for support.

9　FAVORITES
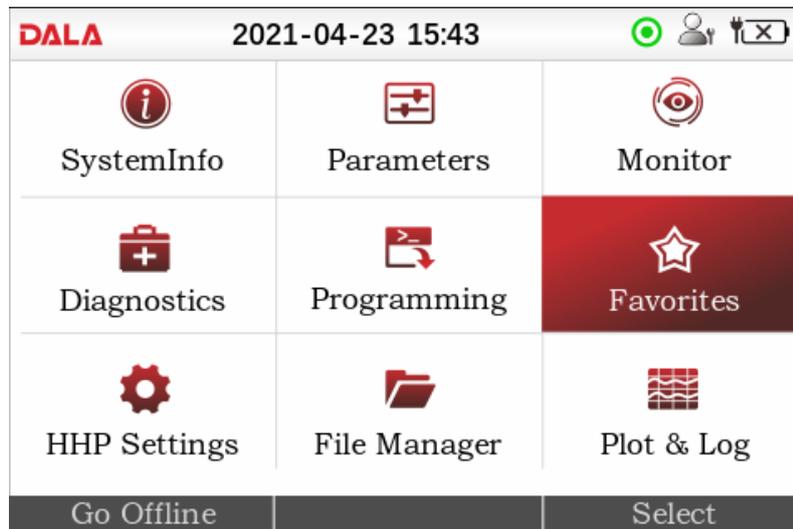

Figure 9.1 Favorites

In the main screen, highlight the Favorites icon and press the "Select" softkey to enter the app. Alternatively, the Favorites key opens the app directly. Return to the main screen at any time by pressing the main screen key.

Use Favorites to build custom sets of parameters and monitor variables that can be easily accessed without needing to navigate through multiple Parameters and Monitor menus. User can add to Favorites the frequently adjusted parameters and regularly checked monitor variables. Parameters and monitor variables that added to favorites cannot be renamed.

Parameter adjustments made within the Favorites app function the same as if the change was made in the Parameter app. It allows entire Parameter or Monitor menu (including any sub-menus) be added at once. Items added to favorites should match the controller model, unmatched controller model will not display favorite items. E.g. items / app added to D2 controller will not be displayed when the specific DS13 connect with D2S, but only available when the DS13 connect with D2 controller.

In main screen, highlight "Favorites" icon and press "Select" or OK to open the app, or in any screen press "Favorites" softkey to open the app. Press Main Screen, Return or left arrow key to return to main screen.

9.1 USING "ADD TO" IN PARAMETERS AND MONITOR

To add an item to Favorites, from within the Parameters and Monitor app's menus, highlight the parameter or monitor variable and select the "Add to" softkey. The "Add to" screen will open and list the available destinations. If the item is a parameter or monitor variable, the destinations are Favorites, Plot, or Log. If the item is a menu, the only destination is Favorites.
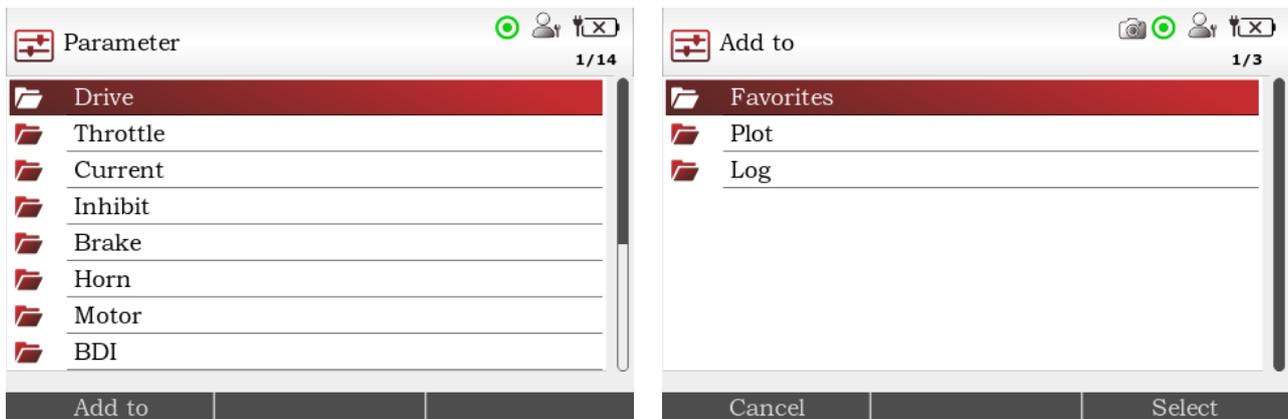

Figure 9.2   Add to favorites

Highlight "favorites" and press OK, right arrow key or "Select" will open favorites and a new series of softkeys.

The "Add" softkey adds the new item to the Favorites. If favorites window has multiple levels of items, use direction keys and right arrow key to select the target folder to add to.
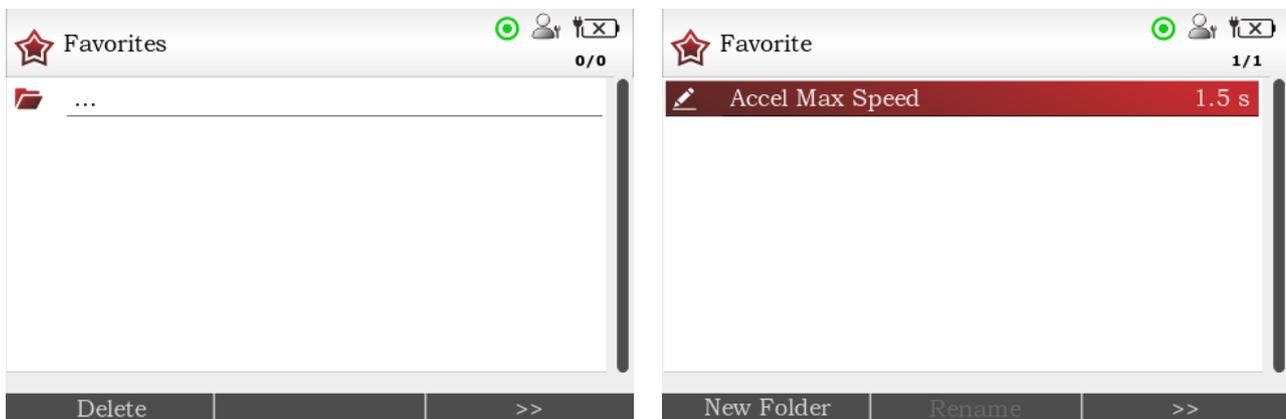
Figure 9.3   Add to favorites

The "Add" softkey adds the new item to the Favorites main window. Use the "»" softkey to switch to "Create New Folder" softkey and keyboard will pop-up, press direction keys and OK to name the new folder and click done to finish creating new folder. (See **chapter 13**, keyboard). Press OK or right arrow key to enter the folder, then press "»" to switch softkey back to "Add to", click the softkey to add item to new folder.

Complete the Add to operation by pressing the "Finish" softkey. The screen will return to the app location (Parameters or Monitor) where the "Add to" softkey was last pressed.
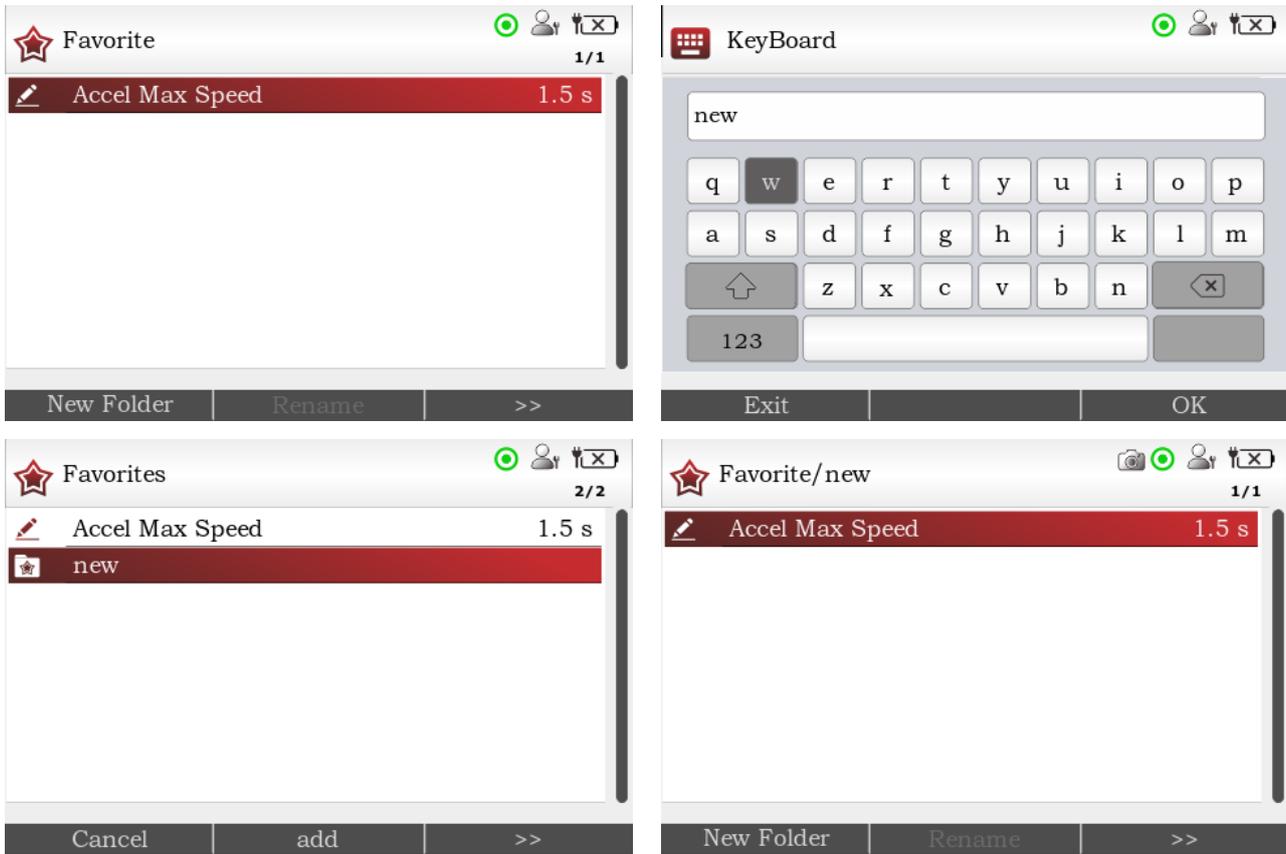
Figure 9.4　Add to new folder

Press "cancel" to abord adding to favorites, the screen will return to the app location (Parameters or Monitor) where the "Add to" softkey was last pressed.

9.2　USING SOFTKEYS WITHIN FAVORITES

Figure 9.5 Softkeys in Favorites

Softkey Name	Description
>>	More softkeys available, click will switch to next available softkey.
Create New Folder	Create a new folder within the present app. DS13 supports max. 10 folders and 50 items under each folder.
Up/Down To	Move the selected item to change the item order.

Delete	Delete the selected item. No pop-up message for this operation, please double check before click the delete key.
Rename	Only valid for new created folder. Not valid for items that in parameter or monitor apps, or added from parameter or monitor apps.

When the selected item is parameter setting, press OK can edit the value. See **chapter 5.2**, adjusting/editing parameters.

10 DS13 SETTINGS

Figure 10.1 Settings

"Settings" allows to set DS13 parameter and operation, which contains 18 items as shown below.
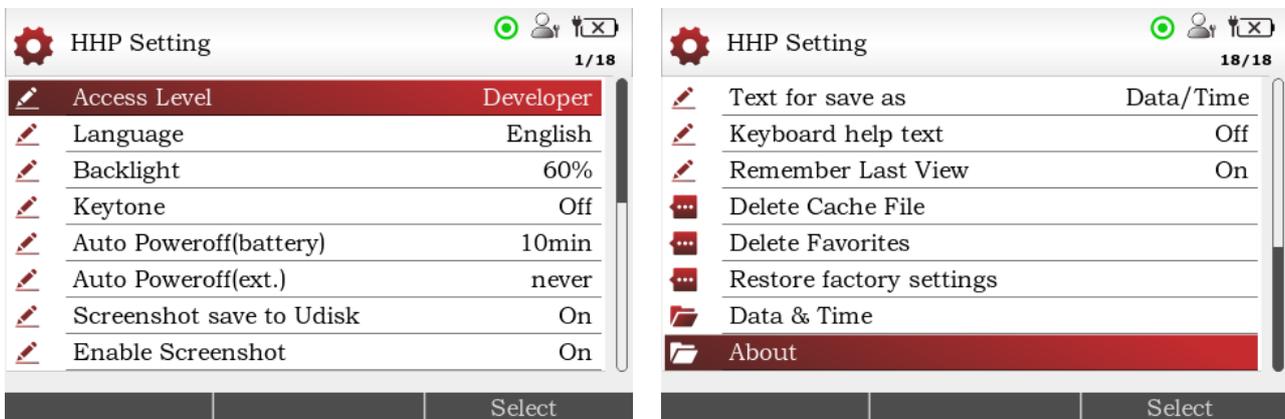

Figure 10.2 Items in settings

Select "Settings" in main screen, press "Select" or OK to open the app, press Main Screen, Return or left arrow key to return to main screen.

10.1 ACCESS LEVEL

The Access Level of the DS13 can be set to its own level or to any lower level. The order (high-to-low) is OEM, Dealer, Service, User and Visitor. Default level is OEM.

10.2　LANGUAGE

Supports English and Chinese.

10.3　BACKLIGHT

Sets the brightness of the DS13's LCD display from 100% to 20% in 5% increments, default setting is 60%. When DS13 is powered by AA batteries, the max. brightness of LCD screen is 40%, and if no operates in 30s, screen brightness will down to 25% in order to conserve the batteries.

10.4　AUTO POWEROFF (BATTERY)

If the DS13 is powered by AA batteries, the DS13 will automatically power off if no buttons are pressed for a period of time that can be adjusted with the "Auto Poweroff (battery)" setting. The available settings are 5, 10, 20, 30, and 60 minutes. Use lower values to conserve the batteries.

10.5　AUTO POWEROFF (EXT)

If the DS13 is being powered by a device, the DS13 will automatically power off if no buttons are pressed for a period of time that can be adjusted with the "Auto Poweroff (ext.)" setting. The available settings are 15, 30, 60, 120 minutes, and never. a

10.6　SET SCREENSHOT SAVE TO USB FLASH

When enable this setting, and plug USB flash in DS13, new screenshots will be automatically saved into USB flash. It's enabled by default.

10.7　ENABLE SCREENSHOT

When set to "Yes", take a screenshot by pressing the Power key and left top softkey will take a screenshot, the process of taking a screenshot takes 30s.

When set to "No" will not allow to take a screenshot.

It's enabled by default.

10.8　LOG & PLOT CYCLE TIME

Sets the sampling rate for the Log and Plot functions. The setting is adjustable from 500ms up to 1 minute in defined steps. Default setting is 500ms.

10.9　SHOW ONLY EMPTY BATTERY

A battery icon showing the state-of-charge of the DS13's battery can be displayed in the upper right corner of the screen.

If set to "Yes", the battery icon is always displayed.

If set to "No", the battery icon is only displayed if the AA batteries are depleted.

Default setting as Yes.

10.10　TEXT FOR "SAVE AS"

When creating a new .dala file, the name of the file can be created manually or automatically, as "dalafile + date/time". If the setting is "No text", default name is "date/time".

10.11　REMEMBER LAST SCREEN

When set to On, selecting an app from the main screen will result in the DS13 returning to the last screen that was used in this app.

When set to Off, selecting an app from the main screen will always result in the app opening at the root (top) screen.

Initial setting is On.

⚠️　Note：When DS13 is turned off, the last-place-memory will lost. Each power-on session begins the Remember Last View anew, even if the setting is "On" .

10.12　DELETE CACHE FILE

This action deletes all cache files, not just the cache file of the presently connected controller. Delete cache file will release internal memory room, but next time when connecting the controller will take more time as load parameters.

10.13　DELETE FAVORITES

Select "delete favorites" and press "Select", right arrow key or OK will delete all items in Favorites (including folders), key-cycle the controller to complete the process.

10.14　RESTORE TO FACTORY SETTING

Select "restore to factory setting" and press "Select", right arrow key or OK will pop-up message "Confirm to restore to factory settings", click Yes will reset all items back to factory settings and delete cache files and favorite files.

10.15　DATE & TIME

This folder contains the following eight items

Show Date/Time in header. When set to On, the date and time are displayed at the top of the main screen. Set to Off will not display the date and time.

12h/24h. Select the format used to display the time.

Date Format. The year can appear first or last. The month can appear before or after the day.
Year, Month, Day, Hour, and Minute allow setting the date and the time for the local time zone. After adjusting these settings, selecting the Main Screen Button will result in the Main Screen showing the selected Date and Time with seconds starting from 00.

10.16　ABOUT

It contains DS13 information such as model name, software version, hardware version, Boot loader versions, etc.

11　FILE MANAGER

Figure 11.1　File manager

The File Manager app is used to manage Internal memory and USB flash files. Use the file manager to browse files in internal or USB flash, or edit files like using "Copy", "Paste", "Move to" or "Delete", etc.

⚠️　Note："Copy", "Paste", "Move to" are only valid in internal memory, cannot use between internal and external memory units. To transfer files between internal and external memory, use USB cable please.

11.1 SOFTKEYS AVAILABLE IN FILE MANAGER

Figure 11.2　Softkeys in file manager

Name	Description
Copy	Copy the selected item. When pressed the Copy, the softkey will changed to "Paste" or "Cancel".

Paste	Paste the copied item to target location.
Move to	Move the selected item (File or Folder) to another folder. When pressed the Move key, the softkey will changed to "Insert" or "Cancel".
Insert	Insert item to target location
Delete	Delete the selected item, confirm message will pop-up before process.

12   PLOT & LOG

Figure 12.1   Plot & Log

The "Plot & Log" contains "Plot" and "Log".

The Plot utility plots the values of selected variables over time. In the Plot Variables List, a colored circle beside each item shows the color that will be used for that item in the plot. The plot can be saved using the screenshot process.

The Log utility creates a log of the values (.csv format) of selected variables over time. The log can then be viewed in a spreadsheet program on a PC.
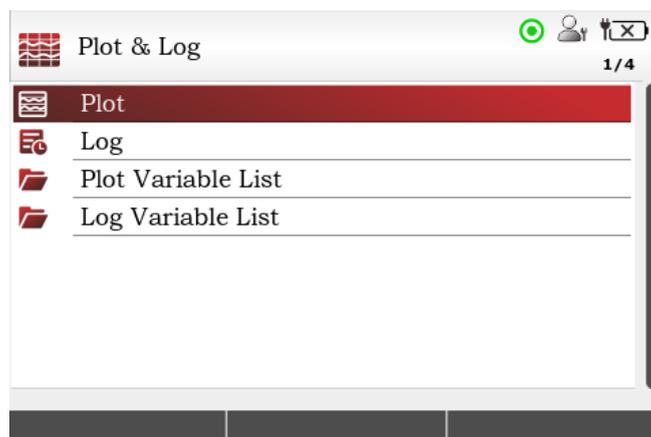

Figure 12.2   Plot & Log

Select "Plot & Log" in main screen, press "Select" or OK to enter the app. Press Main Screen, Return or Left arrow key to turn to main screen.

12.1 ADD PLOT & LOG VALUES

Add items from the Parameter and Monitor app's menus by highlighting an item and pressing the "Add to" softkey. In the next screen, highlight the Plot or Log icon and then press the OK, right arrow key or Select key followed by the "Finish" softkey, system will return to parameters or monitor app.

Different with add to favorites, Plot or Log doesn't support user to create new folder, but only add to existing folder.
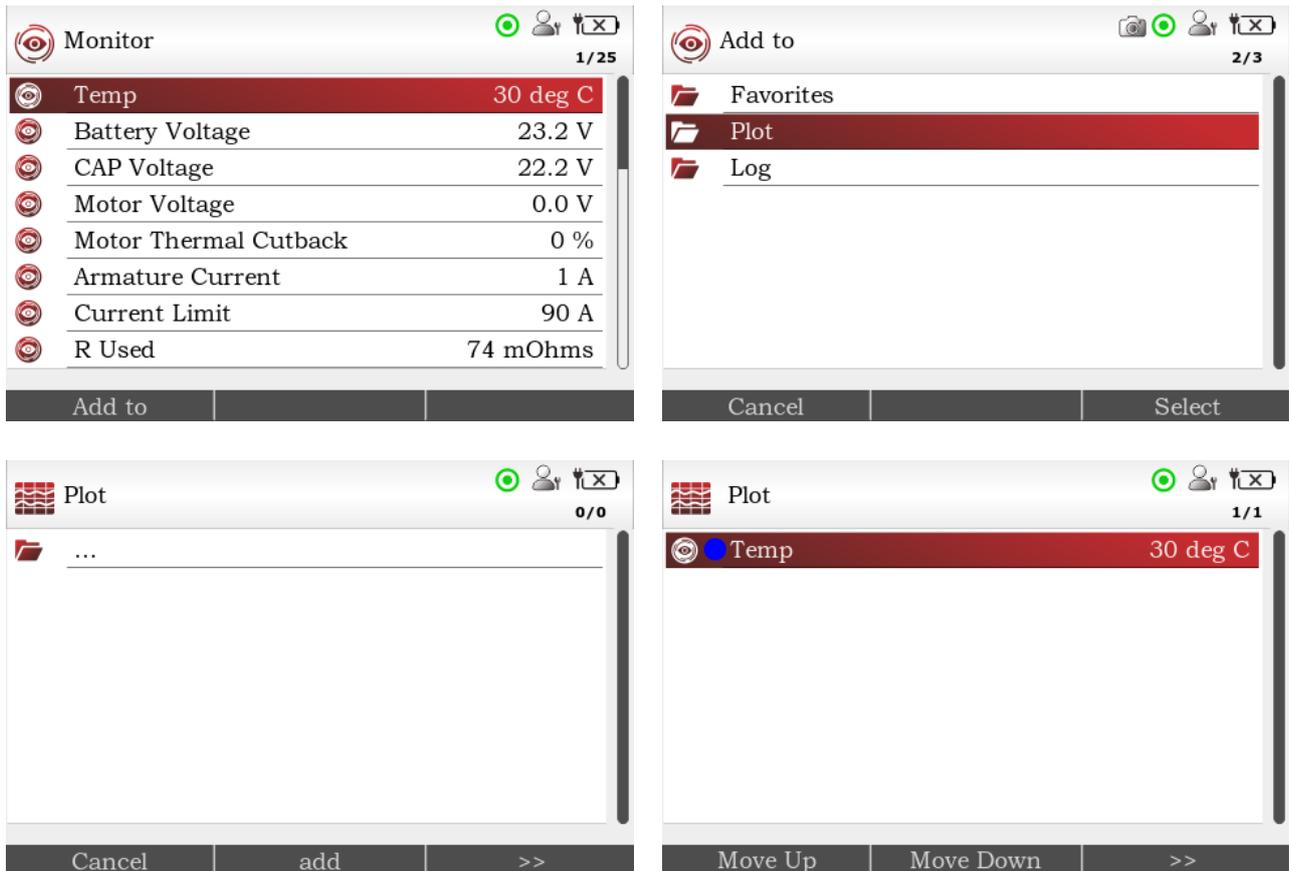
Figure 12.3　　Add plot variables

Press "Cancel" softkey will cancel the process and return to item selected in parameters or monitor app.

⚠️　Note：The limit is 5 items in the Plot Variable List and 8 items in the Log Variable List. To remove an item from a list, select the item and press the "Delete" softkey.

The Log & Plot Cycle Time parameter shown in the DS13 Settings app, menu is adjustable. Use the Plus/Minus keys to change the value. Decreasing the time results in more frequent samples and vice versa. See **chapter 10.8**, Plot & Log cycle time.

12.2 PLOT

Items to be plotted must be added to the Plot Variable List. To create a Plot of the items, highlight "Plot" and then press the OK key or right arrow key to open the plotting program. Press "Start" to begin the plot routine, and "Stop" to end the plotting. The Plotted items will wrap the DS13 screen when the right-edge is reached and resume on the left-edge. A green round icon on right top of screen which indicates the plotting is in process.
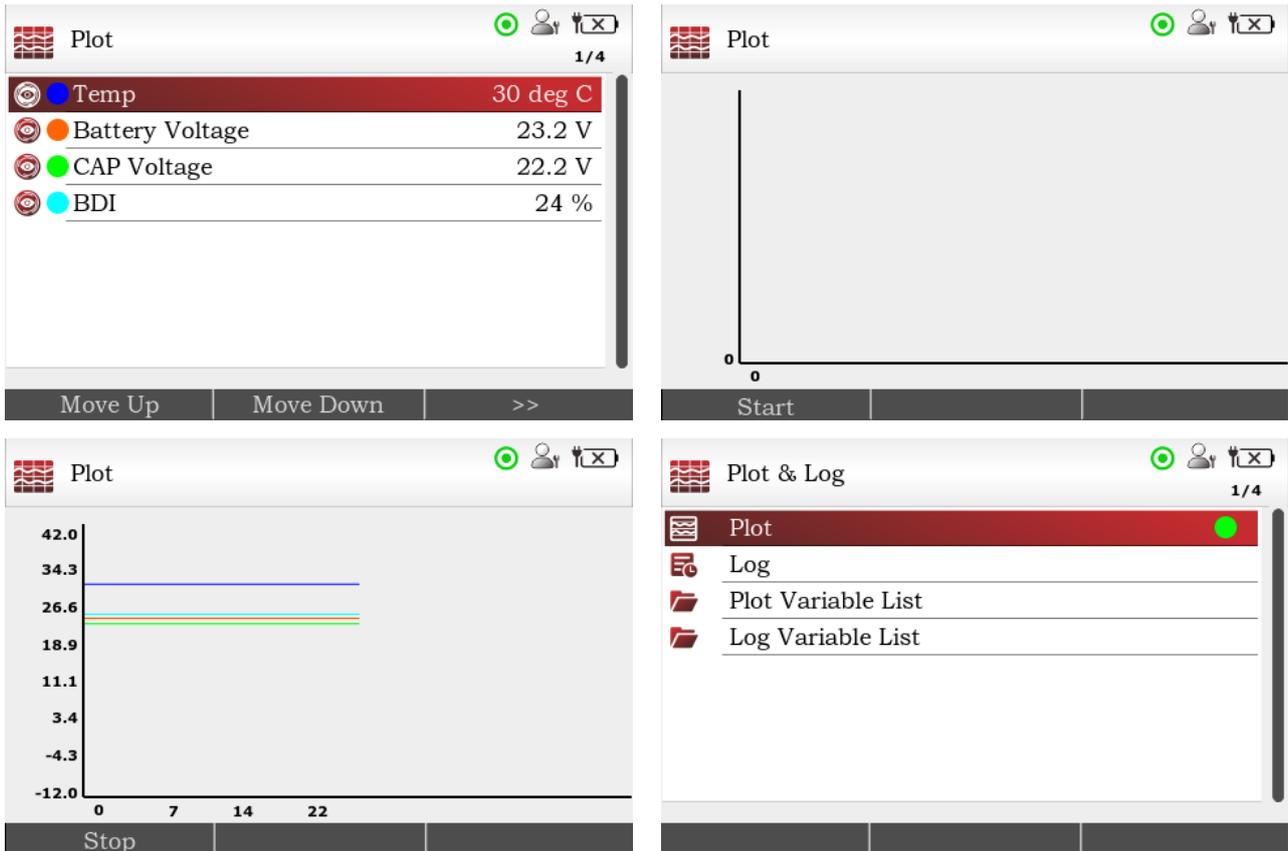

Figure 12.4   The plotting program

To stop plotting, open the Plot app and press "Stop" key.

⚠ Note：In the Plot Variables List, a colored circle beside each item shows the color that will be used for that item in the plot. The colors are in a fixed order, if items are to use a specific color, use the "Move Down" and "Move Up" softkeys to achieve the desired combination. Due to the limitations of the DS13 screen size, plotting items (from parameters or monitor apps) name will not be displayed in plotting screen. Return to the Plot & Log app by using the left-arrow key or the return key. Open the plot variable list by using the right arrow key or the OK key.

Plot images are saved by using the "screenshot" process. Screenshots (.bmp format) can be saved to the internal memory or USB flash. The saved screenshot file cannot be opened with the DS13 and must be viewed using a PC or mobile phone via USB cable connection, see **chapter 14**, Screenshots.

12.3 LOG

Items to be logged must be added to the Log Variable List. To create a Log of the items, highlight "Log" and then press the OK key or right arrow key to open the logging program. Press "Start" to begin the Log routine; a pop-up message will guide you to select either save the log file (.CSV) to internal memory or to USB flash. A green round icon on right top of screen which indicates the logging is in process. During the logging in process, user can switch to other operation using the DS13.

To stop logging, highlight the item and press the OK or the right arrow key. Log files are saved by default to folder "LogFile" and named by date/time. LogFiles can be browsed through the File Manager. The saved log file (.CSV) cannot be opened with the DS13 and must be viewed using a PC or mobile phone via USB cable connection.
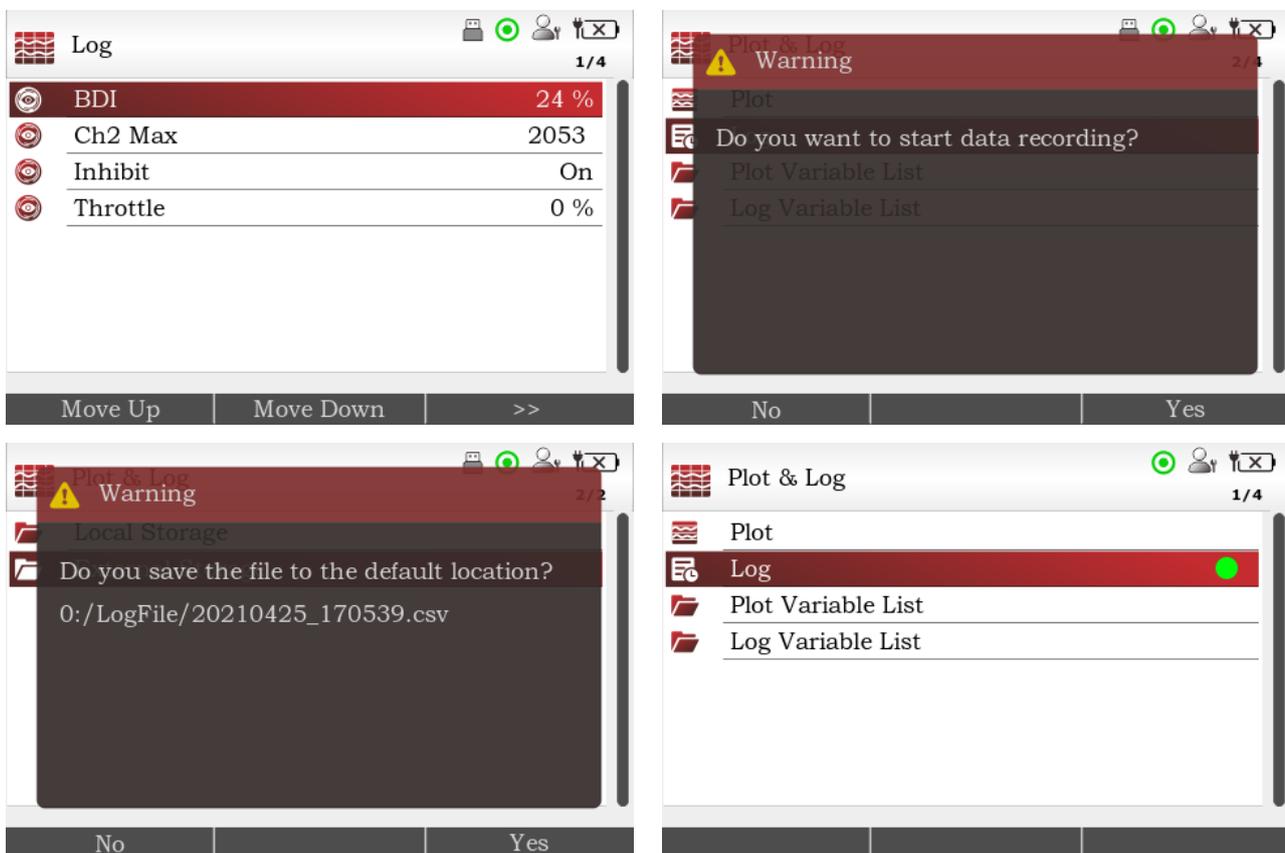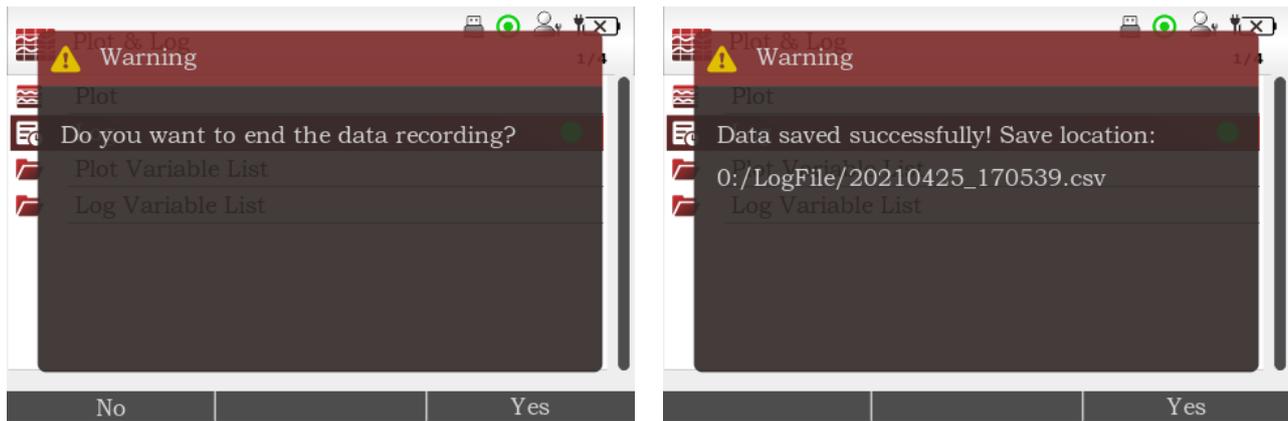
Figure 12.5　Logging Program

Within the Log Variable List, parameters can be selected and their value changed following the same process as described in the Parameter app (Chapter 4). Highlight the parameter and press right-arrow key or the OK key to open the detail screen. Adjust the parameter and then use the left-arrow key to return

to the log Variable List. Changes take place immediately and are carried over into the Parameter and any other locations that the parameter is displayed.
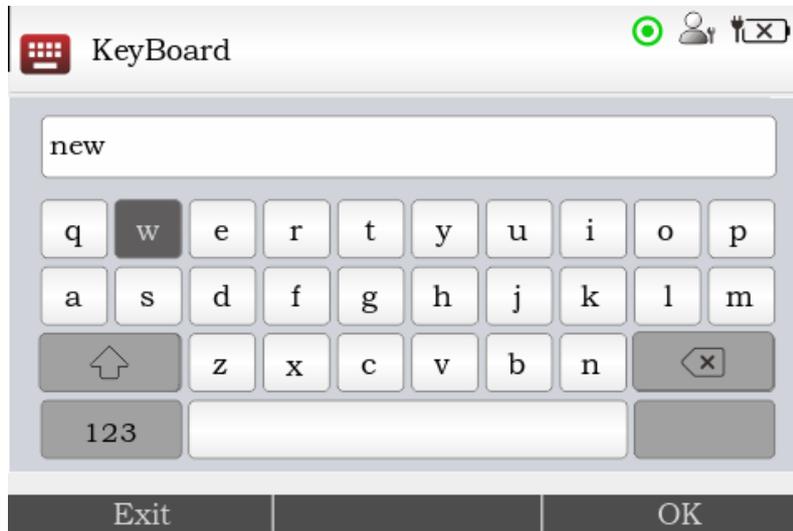
13　KEYBOARD

Figure 13.1 Keyboard

The Favorites and Programming apps have the ability to rename items or create new folders. These activities use the DS13 pop-up keyboard.

In the text line, use the direction keys to highlight target letter and use the OK key to confirm. E.g., when the highlighted letter is "a", press the left arrow key will move to highlight letter "m", when the highlighted letter is "q", press the up arrow key will move to digit bar.

Name	Icon	Description
ABC −> abc	⇧	When highlight in letter area, to select between uppercase or lowercase letters, each press of this softkey will alternate between "ABC −> abc" and "abc −> ABC"；when highlight in digit and symbol area, press the OK key to display all digits and symbols.
Delete	⌫	Deletes the highlighted letter.
Digits	123	Use the key to switch to digit and symbol. Press the OK key to switch keyboard between digits and letters.
Letters	ABC	Use the key to switch to letters keyboard.

14 TAKING SCREENSHOTS

The DS13 can capture an image of the display screen and save it to the internal memory or USB flash as a bit map file (.bmp format). When a USB flash connected to DS13 and system is set to save screenshots to USB flash, the captured imaged will be saved to USB flash. See **chapter 10.6**, save screenshots to USB flash.

Screenshots are named by date/time. Each screenshot file is typically about 450 KB and the image is 320 x 480 pixels. When the screenshots are saved to internal memory (16MB), pay attention to the available memory room. The captured image cannot be viewed using the DS13. The .bmp file must be transferred to a PC or mobile phone via USB cable, and then opened from the PC or mobile phone.

Screenshots are taken by pressing and releasing the Power key and then immediately pressing and releasing the left top softkey. The 2 buttons must be pressed in quick succession. After 30 seconds, a pop-up message confirming that a screenshot was taken will appear.
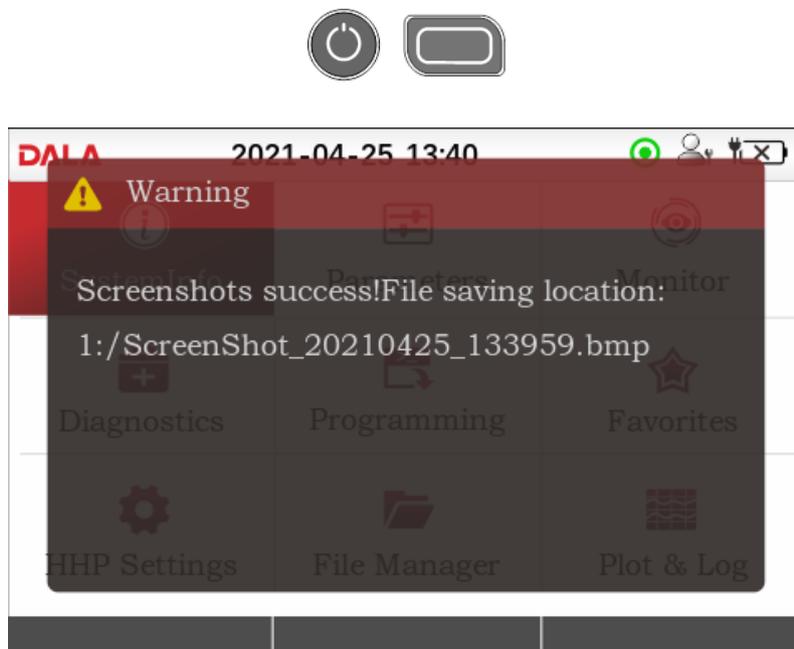

Figure 14.1   Taking a screenshot

15 WORKING OFFLINE

Working Offline is the process of performing various DS13 functions while not connected to a device. DS13 can load a .dala file in offline, adjust its parameter settings, and save these into the same or a new .dala file that can be restored into a controller when the DS13 is online again.

To work offline with the DS13 disconnected (DS13 cable not attached to anything), 2 AA batteries must be installed in the DS13 or DS13 is charging via USB Type-C cable which connected to a portable charger or adapter.

Select a .dala file in either internal memory or USB flash by open the File Manager , press the Open key to load the specific file. Working offline, on top state bar will display icon ⊘, during working offline, DS13 cannot process Plot & Log apps.
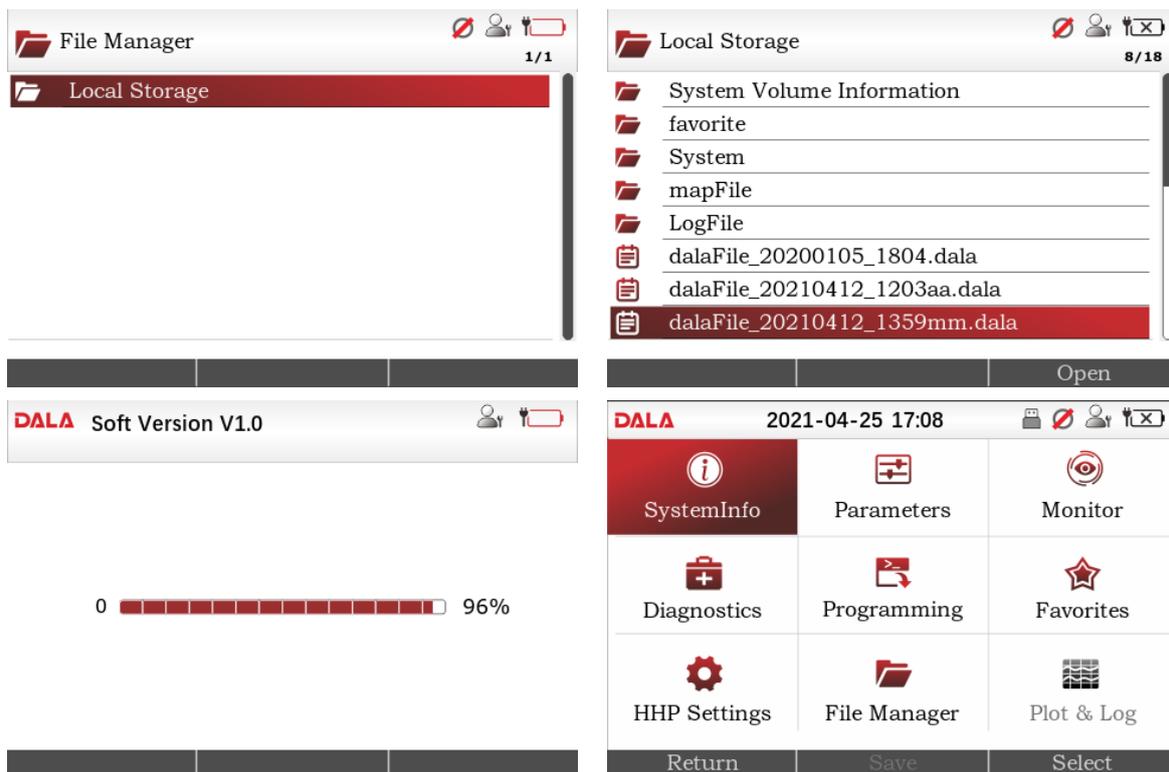

Figure 15.1   Working Offline

Use this offline mode to check, adjust or edit parameter settings, which the operation is same as working online, see chapter 5.2, adjusting/editing parameters. The difference is when working online, the changes are immediately, while working offline will create a temporary cache file and save the offline changes to .dala file.

16　UPDATING THE DS13 SOFTWARE

The software in DS13 is easily updated. As software updates become available, they may be installed into the DS13 via the USB flash. (Specifications: ≤32GB, FAT32)

You can obtain update software file (.SC file) from dealer or DALA support, the file name is fixed as "DS13_APP1.SC", when you got the updated file please make sure it is named as "DS13_APP1.SC" , otherwise you should rename it to "DS13_APP1.SC".

DS13 is recommended to be charged from portable charger or adapter via USB Type-C during its software updating. Plug USB flash into DS13 USB port, then connect charger to DS13 to start charging. (Charging DS13 should be started after USB flash has been plugged, or cannot accomplish the updating.) DS13 will turn on automatically and detect USB flash to locate file DS13_APP1.SC, a message as below will pop-up when update file is found and verified success:
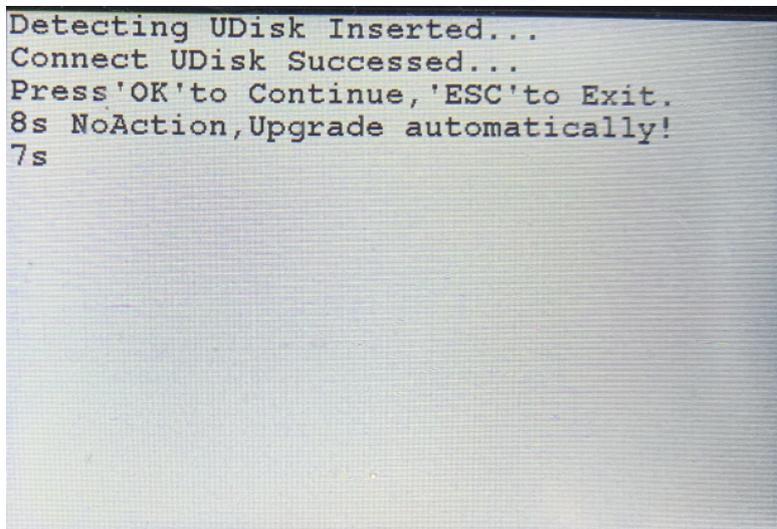

Figure 16.1　　Update DS13 via USB Flash

You can confirm to process the update in the message. If no confirmation made (press the OK or left top softkey) within the message count down in 8s, DS13 will start updating automatically. To cancel the updating, press "ESC" before the count down ends.
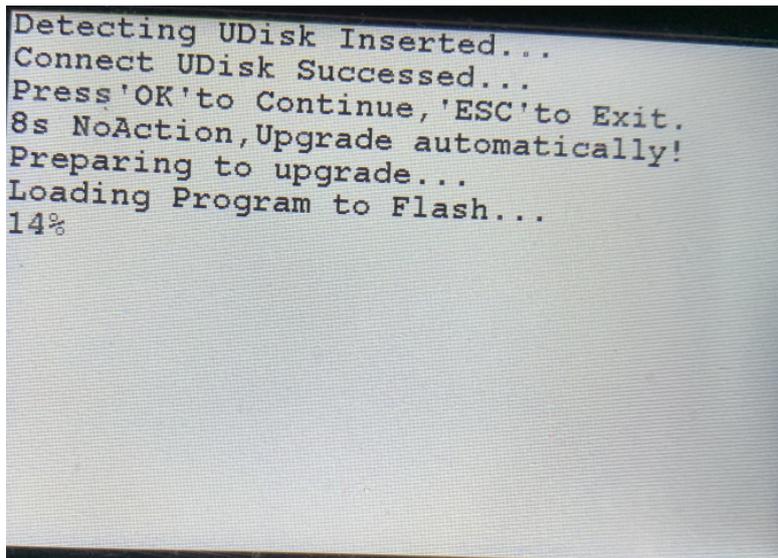
Figure 16.2　Updating DS13 system

The upgrade process may take about 3 minutes, make sure no interrupt in charging during the process and do not disconnect USB flash, either of them will cause upgrade fail and software lost.

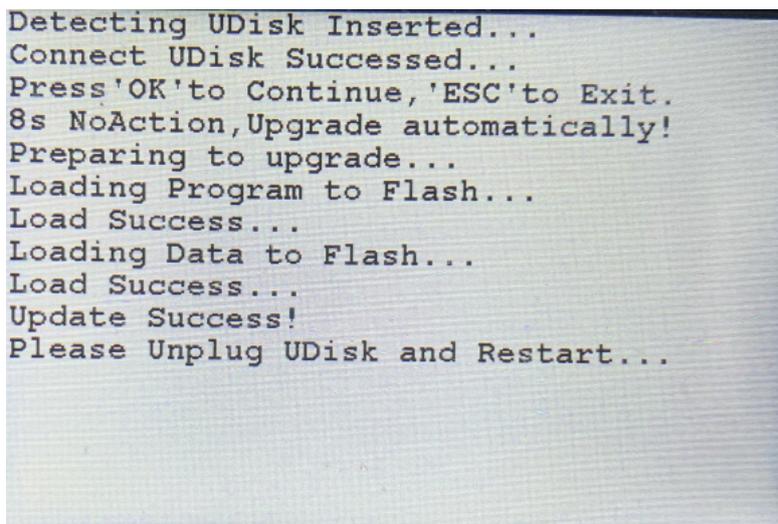Once the process finished, will pop-up a message as following:

Figure 16.3　Update Success!

After update success, unplug USB flash first, then can stop charging the DS13. New software version can be checked in DS13 settings-About.

APPENDIX A　DS13 FILE TYPES

Several types of files are handled by the DS13 handheld programmer. Here they are listed alphabetically, by their extensions.

.CSV	Log file, can be opened using spreadsheet on PC
.dala	Parameter settings file These files contain the settings for the adjustable parameters. You can create the file using " save .dala file" in Programming app, or "Restore .dala file" to load and restore file from internal memory or USB flash.
.SC	Software Updating File Which contains firmware updating file of DALA controllers, and DS13's software updating file.

APPENDIX B　　DS13 SPECIFICATIONS

ITEM	DESCRIPTION
Display	3.5 inch IPS color LCD
Input Voltage	9~55V
Power	1W
Communication	UART / CAN
Updating	Via USB Flash
Internal Memory	16MB
Batteries	2*AA batteries
Working temperature	-20~50　℃
Storage temperature	-40~85　℃
Weight	0.23kg