

Matrix xr
(Matrix Treadmill, Ascent, Bike,
Suspension Elliptical, and Climbmill)
Software Flowcharts

Rev. A2.3
Date: 5/25/2017

V 0.1, 05/06/2015	Newly created.
V 0.2, 09/30/2015	Update first time set up Fix but in rolling hill ECB workout table update workout time setting
V1.1	Update U/R/A/E 30 secondary screen Update Ascent Trainer manual setup step
V1.2	Remove Constant watts on 30 series. Remove Fat burn on 50 seires.
V1.3	Fix workout table issue Clarify THR program slow down rate when now THR is detected.
V1.4	Add workout summary screen whenever a workout is end
V1.5	Add lube belt info for TF30, TF50, T50
V1.6	Change Max Incline on TF30, TF50, T50 to 12%. Workout table update regarding to this change.
V1.7	Change Max Incline on TF30, TF50, T50 to 15%. Change workout table regarding to this change. Add Over speed detection due to this change.
V1.8	Add Climbmill Function
V1.9	Add Climbmill workout sheet Add Climbmill land mark workout detail
V2.0	Add Passport 2 compatibility Make modification on Climbmill Eng mode
V2.1	Add T30, T60 to compatible frame Change lube belt distance for TM to be 300 mile from 150mile. Add Lube chain message for C90 Change Fat burn workout table for C90 Add Overspeed protection for T60 Add notification for T60 workout table
V2.2	Change Calorie Formula for EP and AT Add in Ramp up time for Sprint 8 workout.
V2.3	Change Max Incline for T30 to 12%

I. Programming**TM**

Manual
 Intervals (speed)
 Target Heart Rate (Speed)
 Rolling Hill
 Sprint 8

Bike/Suspension Elliptical/Ascent

Manual
 Intervals (resistance)
 Fat Burn (30 series only)
 Target Heart Rate (resistance)
 Constant Watts (50 series only)
 Sprint 8

Climbmill

Manual
 Fat Burn
 Intervals (Resistance)
 Landmarks
 Target Heart Rate (Resistance)

II. Other functions

Non-GUI WiFi module
 Passport compatible
 Wireless HR
 USB for software upgrade
 ERP power saving mode

III. Specifications**TM**

- Display Type: **STN LCD display**
- Language: English, German, French, Italian, Spanish, Dutch, Portuguese, Vietnamese
- Speed Range: 0.5mph – 12.5mph
- Incline levels: 0%-15%, **0%-12% for T75 and T30**
- Incline motor: **Depending on Frame (500lb lift motor for Retail)**
- Demo mode: Yes
- Fan: No
- Speaker: No
- **Buzzer: Yes**
- User Weight: **Depending on Frame, default 150lb.**
- **Models: TF30, TF50, T50, T70, T30, T60**

Bike/Elliptical/Climbmill

- Display Type: **STN LCD display**
- Language: English, German, French, Italian, Spanish, Dutch, Portuguese, Vietnamese
- Resistance Range: ECB: 1-20 (defaults to 1, increases at 1 increment)
 Induction Brake: 1-30 (defaults to 1, increases at 1 increment)
- Resistance systems: ECB & Induction Brake
- Incline motor **Depending on Frame**
- Demo mode Yes
- Fan: No
- Speaker: No
- **Buzzer: Yes**
- User Weight: **Depending on Frame, default 150lb.**
- **Models: R30, R50, U30, U50, A30, A50, SE30, SE50, C90**

IV. Notes:

This document provides a brief chart to describe how the console performs and provides a basic direction of how software programming goes, so it can not be as accurate as software flowchart defined by software engineering and UML. And it can not replace software itself.

ENGLISH	→	<i>English</i>	✓
GERMAN	→	<i>Deutsch</i>	✓
FRENCH	→	<i>Français</i>	✓
ITALIAN	→	<i>Italiano</i>	✓
SPANISH	→	<i>Español</i>	✓
DUTCH	→	<i>Netherlands</i>	✓
PORTUGUESE	→	<i>Portuguê s</i>	✓
CHINESE (S)	→	中文简体	x
CHINESE (T)	→	中文繁體	x
JAPANESE	→	日本語	x
THAI	→	ภาษาไทย	x
MALAYSIAN	→	<i>Melayu</i>	x
KOREAN	→	한국어	x
SWEDISH	→	<i>Svenska</i>	x
FINNISH	→	<i>Suomi</i>	x
RUSSIAN	→	<i>русский</i>	x
ARABIC	→	العربية	x
POLISH	→	<i>Polski</i>	x
VIETNAMESE	→	<i>Tiếng Việt</i>	✓
TURKISH	→	<i>Türkçe</i>	x

Workouts

Console	xr	xr					
Category	Treadmill	Bikes	Bikes	Elliptical	Elliptical	Ascent	Ascent
Platform	T	U / R 30	U / R 50	E30	E50	A30	A50
THR / Heart Rate	✓	✓	✓	✓	✓	✓	✓
incline	X	X	X	X	X	X	X
speed	✓	X	X	X	X	X	X
resistance	X	✓	✓	✓	✓	✓	✓
Training	✓	✓	✓	✓	✓	✓	✓
manual	✓	✓	✓	✓	✓	✓	✓
fat burn	X	✓	X	✓	X	✓	X
rolling hills	✓	X	X	X	X	X	X
intervals (resistance)	X	✓	✓	✓	✓	✓	✓
intervals (incline)	✓	X	X	X	X	X	X
constant watts	X	X	✓	X	✓	X	✓
glutes	X	X	X	X	X	X	X
Goals	X	X	X	X	X	X	X
time	X	X	X	X	X	X	X
distance	X	X	X	X	X	X	X
floors	X	X	X	X	X	X	X
calorie	X	X	X	X	X	X	X
Sprint 8	✓	✓	✓	✓	✓	✓	✓
Landmarks	X	X	X	X	X	X	X
Fitness Test	X	X	X	X	X	X	X
gerkin	X	X	X	X	X	X	X
cooper	X	X	X	X	X	X	X
army	X	X	X	X	X	X	X
navy	X	X	X	X	X	X	X
marine	X	X	X	X	X	X	X
air force	X	X	X	X	X	X	X
peb	X	X	X	X	X	X	X
wfi	X	X	X	X	X	X	X
sub-max	X	X	X	X	X	X	X
capt	X	X	X	X	X	X	X
Virtual Active	X	X	X	X	X	X	X

Console	xr
Category	Climbmill
Platform	C
THR / Heart Rate	
incline	X
speed	X
level	✓
Training	
manual	✓
fat burn	✓
rolling hills	X
intervals (level)	✓
intervals (incline)	X
constant watts	X
glutes	X
Goals	
time	X
distance	X
floors	X
calorie	X
Fitness Test	
gerkin	X
cooper	X
Stepper Fitness Test	X
army	X
navy	X
marine	X
air force	X
peb	X
wfi	X
sub-max	X
capt	X
Sprint 8	X
Landmarks	✓
Virtual Active	X

Treadmills

Calories

For Walking: 4 MPH or less $((\text{MPH} \times 26.8) \times .1) + (\% \text{grade} \times (\text{MPH} \times 26.8) \times 1.8) + 3.5) \times (\text{lbs.}/2.2) \times .005 = \text{cal/min}$

For Running: 4.1 MPH or more $((\text{MPH} \times 26.8) \times .2) + (\% \text{grade} \times (\text{MPH} \times 26.8) \times .9) + 3.5) \times (\text{lbs.}/2.2) \times .005 = \text{cal/min}$

Watts :

W=Calories/ Hr / 4.2

Mets

For Walking: 4 MPH or less $\text{METs} = (3.5 + (2.68 \times \text{speed mph}) + (48.28 \times \text{speed mph})(\% \text{incline})) / 3.5$

For Running: 4.1 MPH or more $\text{METs} = (3.5 + (5.36 \times \text{speed mph}) + (24.14 \times \text{speed mph})(\% \text{incline})) / 3.5$

Programmable Ascent and Elliptical (Mx)

$\text{Cal/Min.} = ((\text{MPH} \times 26.8 \times 0.2) + 3.5) \times \text{Weight(kg)} \times 0.005$

Speed (Mx Ascent)

Speed (mph) = rpm/16 or RPM x 66 x 0.00947 0.1 mph

Mets

Mets (ep/bike/ascent) = $(\text{watts} \times 12) + (\text{weight(kg)} \times 3.5) / (\text{weight(kg)} / 3.5)$

Bikes

Programmable Bike

$\text{Cal/Min.} = (((\text{watts} \times 6)^2) + (3.5 \times \text{body weight(kg)})) \times 0.005$

Speed

Speed=cube root $(52.63 \times (\text{watts}-13))$ VF and Mx Added 06-26-09

Climbmill:

Calories = $(\text{METs} \times 3.5 \times \text{Weight}) \div 200$ (Weight unit : kg) Cal/min

Mets = $\text{MaxVo2} / 3.5$

Watts = $\text{weight} \times 9.8 \times 1.119 \times \text{SPM} \times 0.0033867$

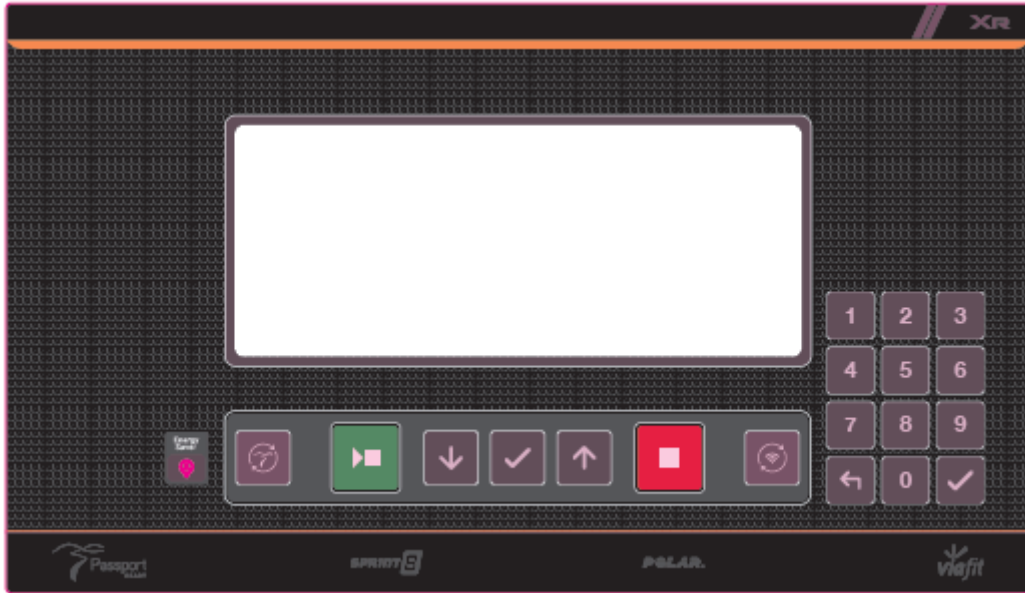
VO2 max = $(\text{watts} \times 12) + (\text{weight(kg)} \times 3.5) / \text{weight(kg)}$

Hight = Stair height * total stairs

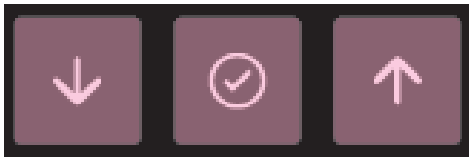
C90 Level Vs SPM

Level	SPM
1	24
2	29
3	33
4	38
5	43
6	48
7	52
8	57
9	62
10	66
11	71
12	76
13	80
14	85
15	90
16	95
17	99
18	104
19	109
20	113
21	118
22	123
23	127
24	132
25	137
26	142
27	146
28	151
29	156
30	160

Matrix xr Overlay Universal



Universal overlay



Down key Enter Key UP key



Stop button



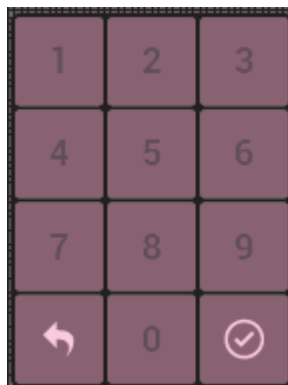
Start button



Passport Button



WiFi button

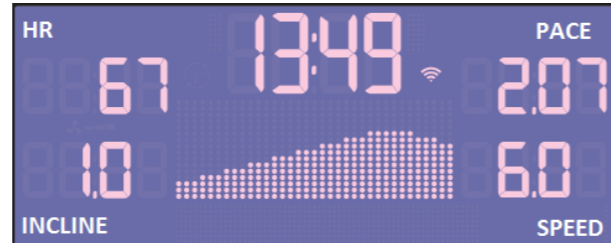


Number keys, enter key, back/delete key

TM Screens



TM Primary Screen

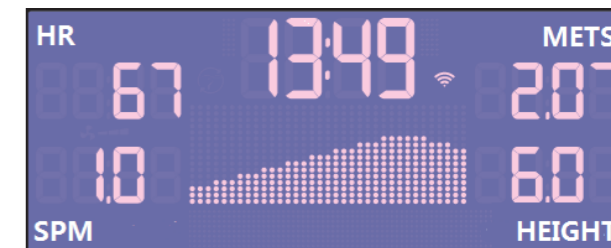


TM Secondary Screen

C90 Screens



C90 Primary



C90 Secondary

A50 Screens



AS Primary Screen

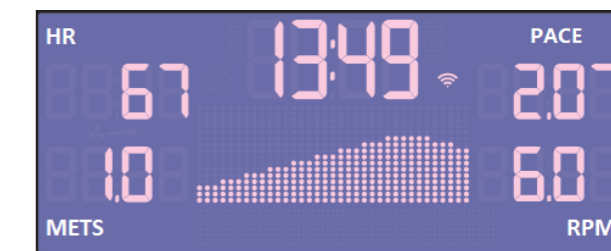


AS Secondary Screen

A30 Screens



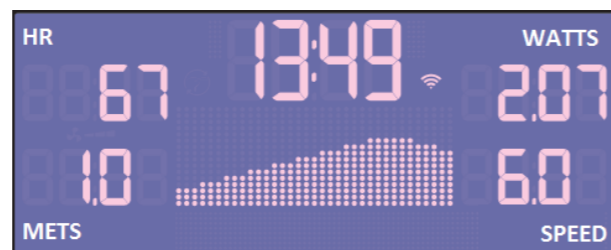
AS Primary Screen



E50,R50,U50 Screens



EP/Bike Primary Screen

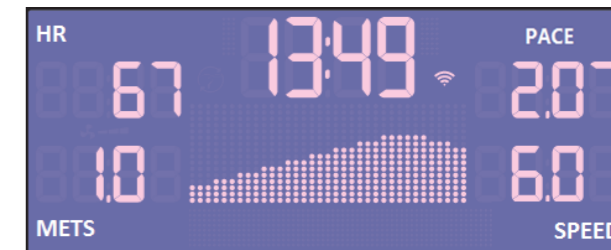


EP/Bike Secondary Screen

E30,R30,U30 Screens



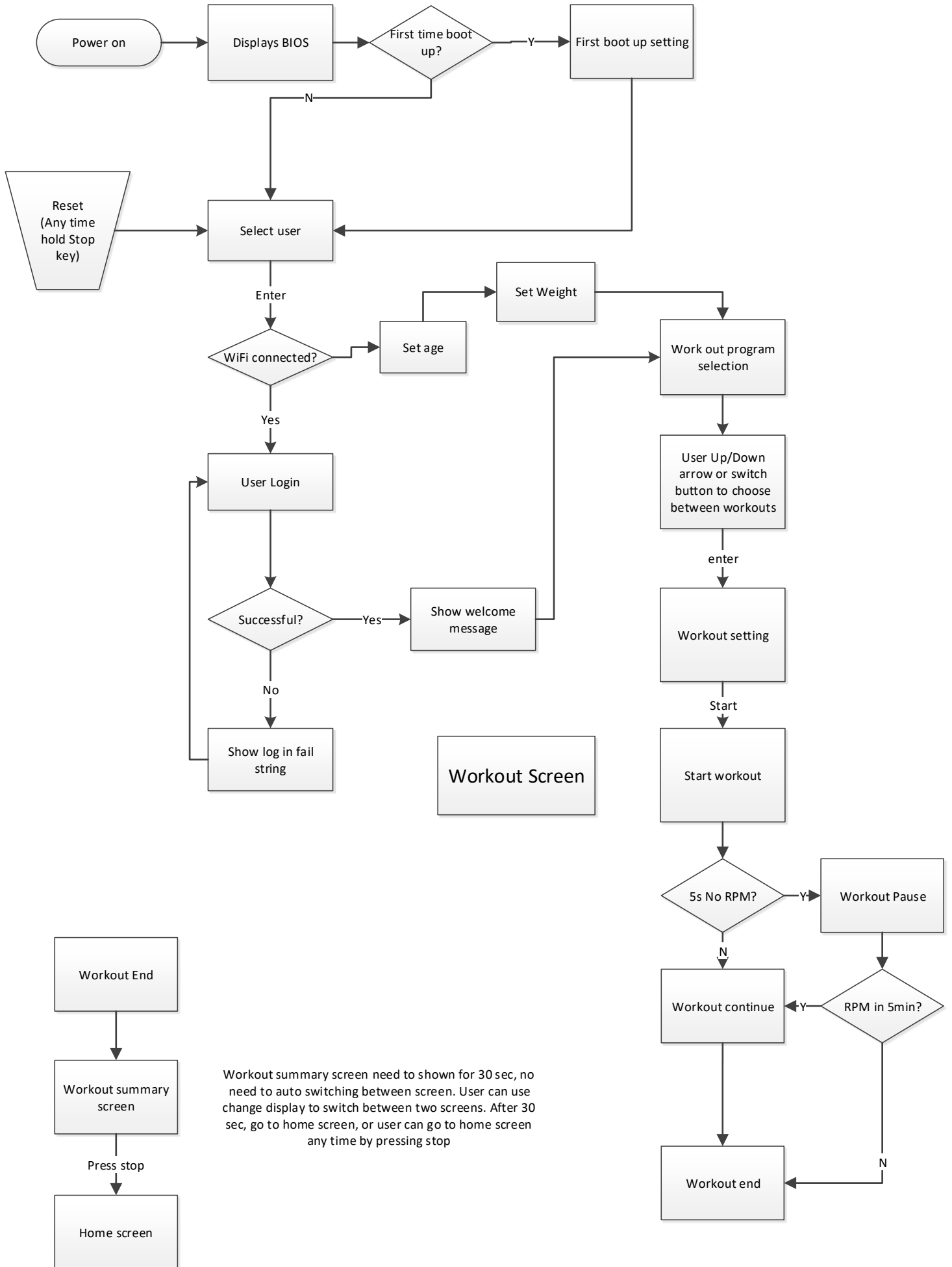
EP/Bike Primary Screen



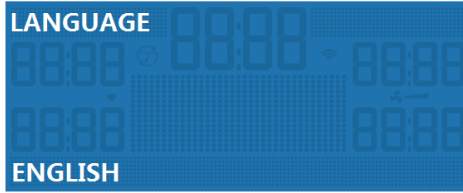
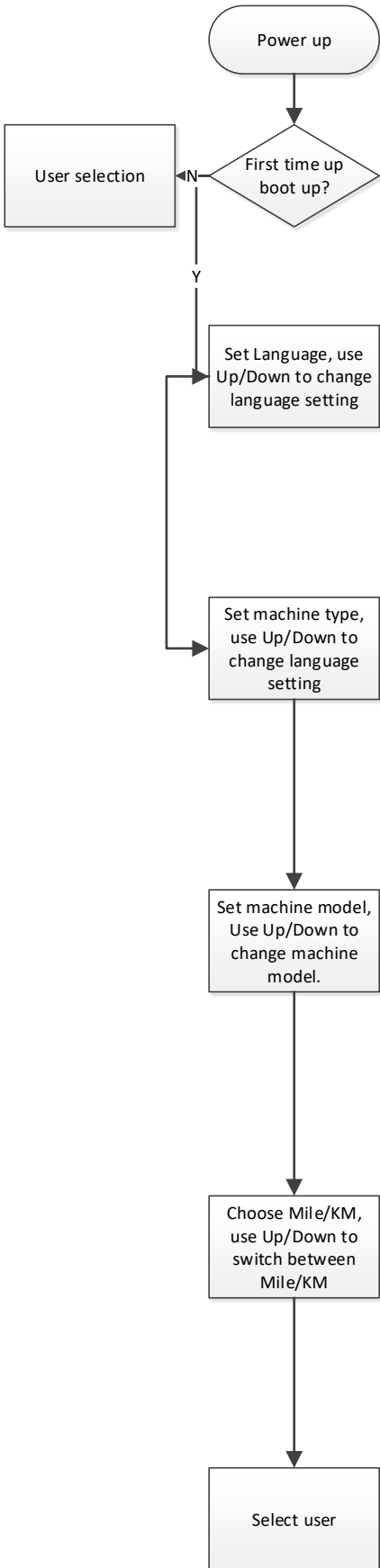
EP/Bike Secondary Screen

- 1, Primary Screen and Secondary Screen switch by pressing change display button.
- 2, Constant Watts/THR program show secondary screen first.
- 3, Hold Change display button 3 seconds to enter scan mode, screens change every 10 seconds.

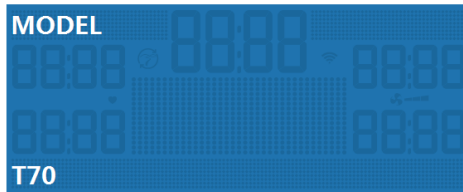
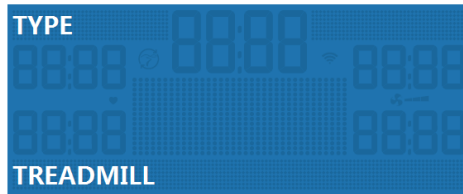




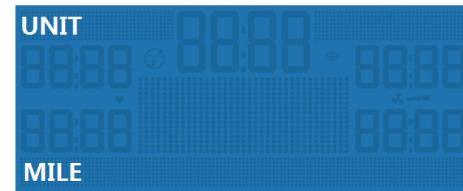
Workout summary screen need to shown for 30 sec, no need to auto switching between screen. User can use change display to switch between two screens. After 30 sec, go to home screen, or user can go to home screen any time by pressing stop



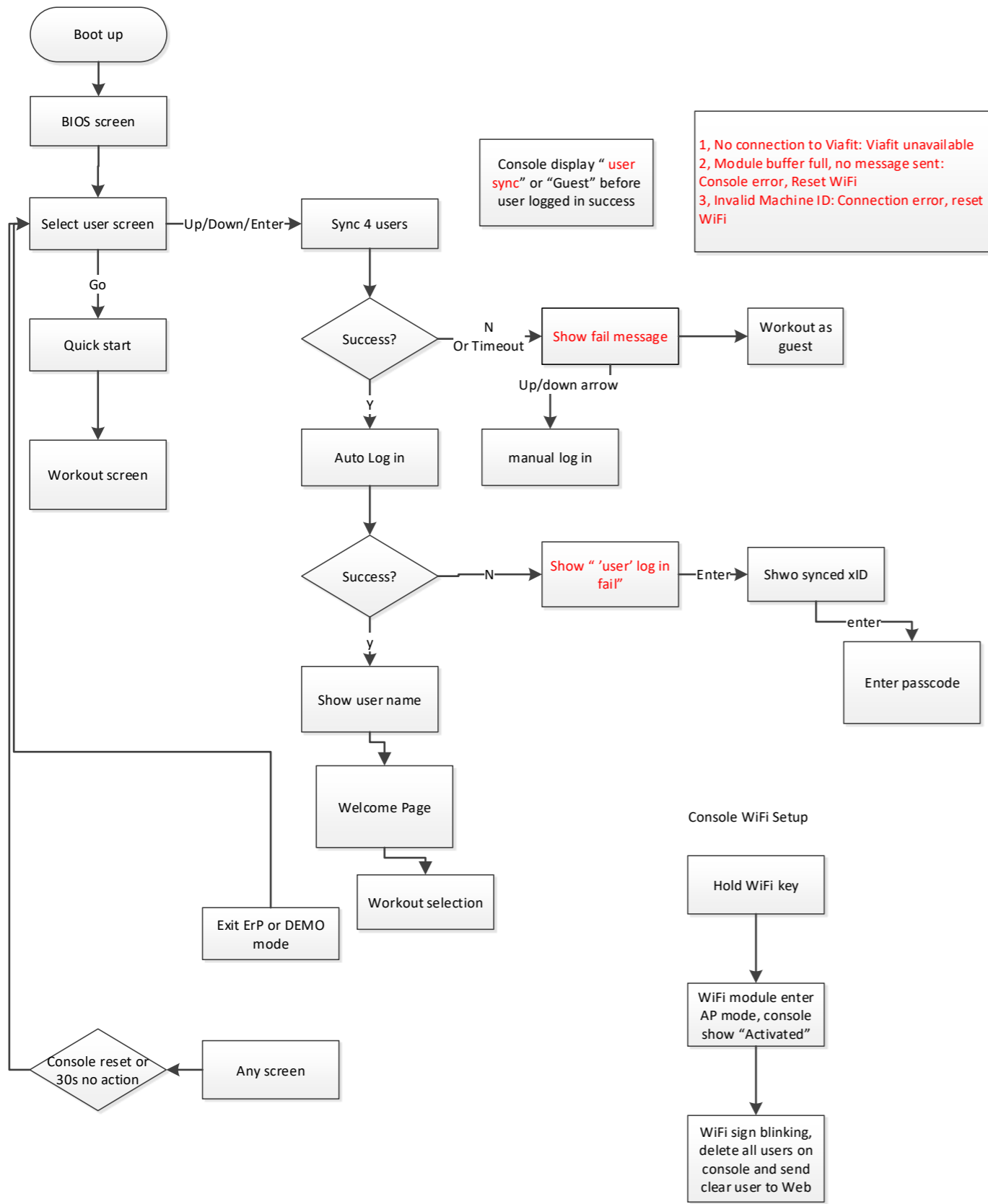
“Language” stay static on top left dot matrix, language option display on bottom dot matrix, order of display: English > Deutsch> Francias> Italiano> Espanol> Netherlands> Portugues> Tieng Viet



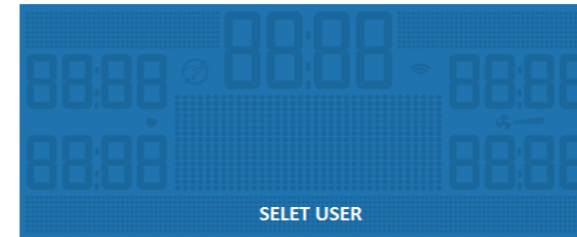
“model” stay static on top left dot matrix, machine model option display on bottom dot matrix, order of display: TF30> TF50> T50> R30> R50> U30> U50> A30> A50> E30> E50. T70 should be auto detected, C90 will be auto detected



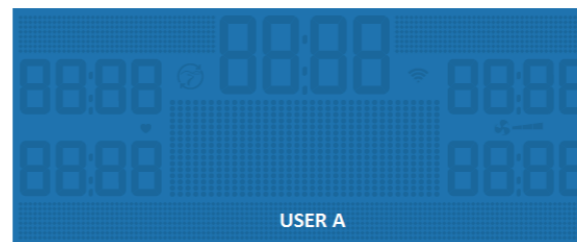
“set unit” stay static on bottom dot matrix, unit option display on top left dot matrix, order of display: Mile> KM



Bios Screen



Select User screen



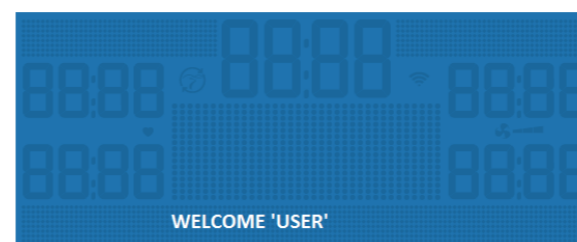
User Screen



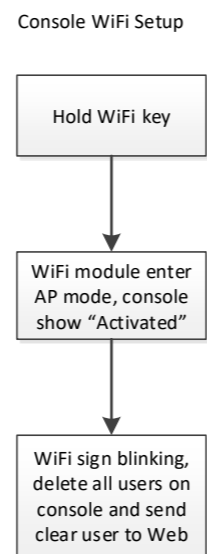
Manual Log In input xID



User name screen



Welcome Screen

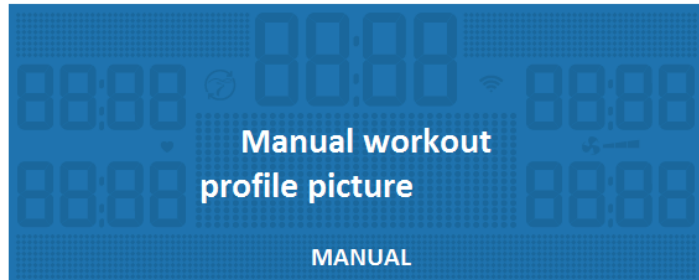
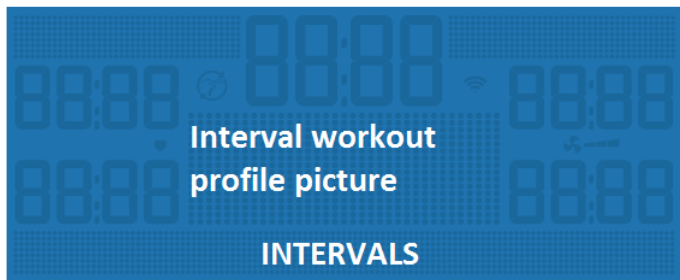
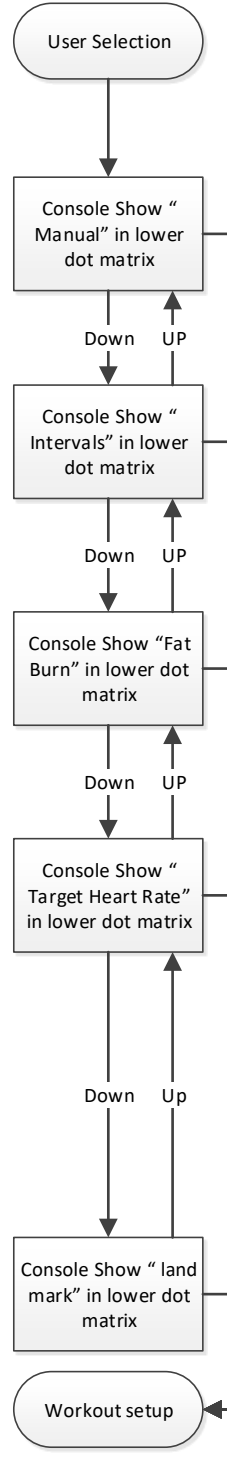
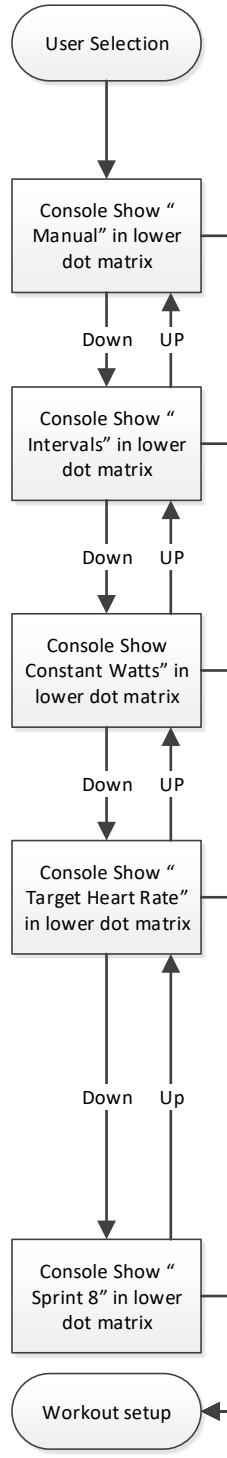
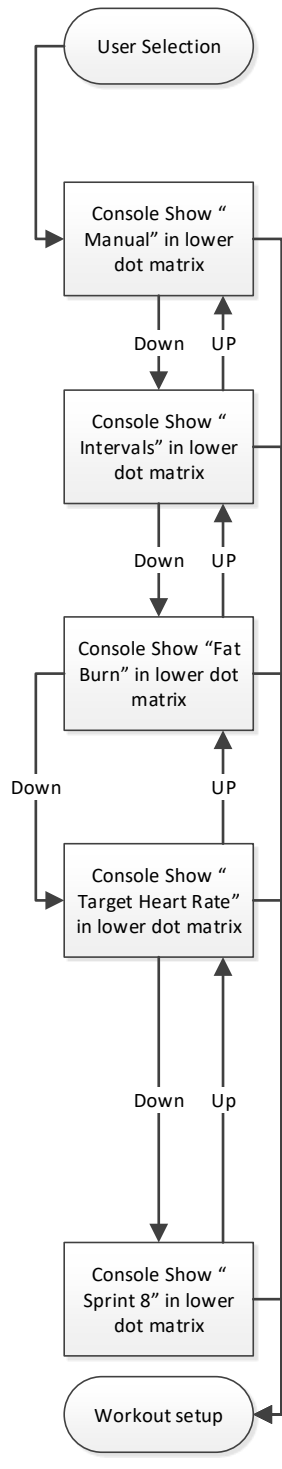
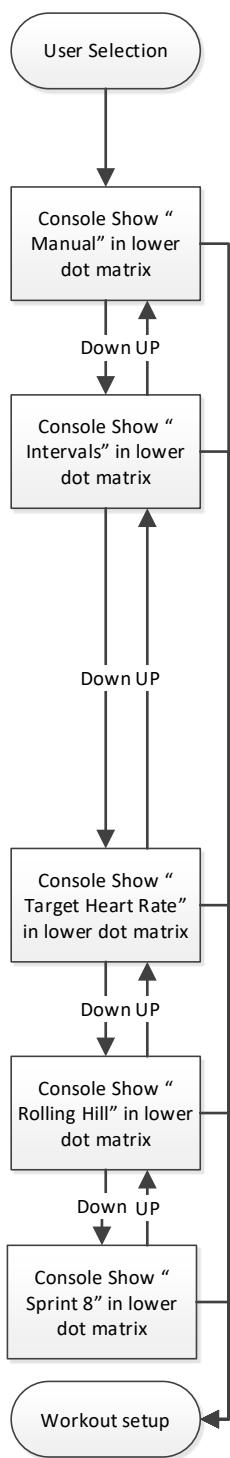


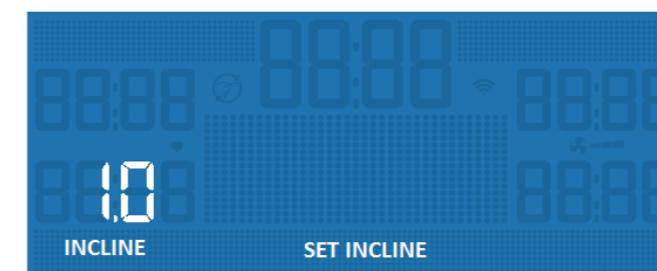
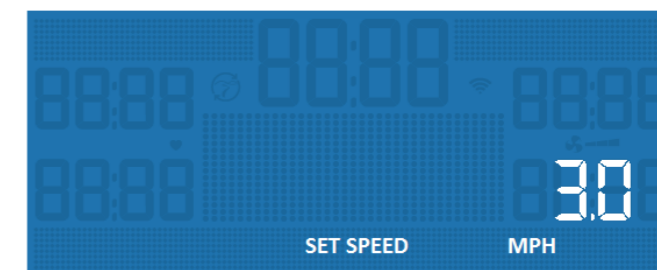
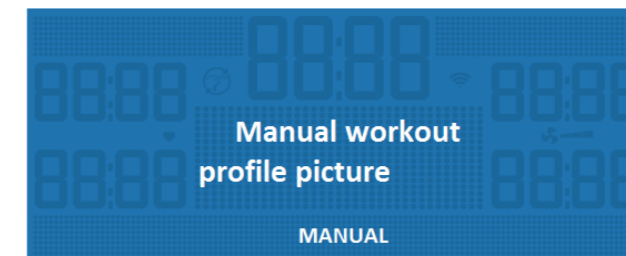
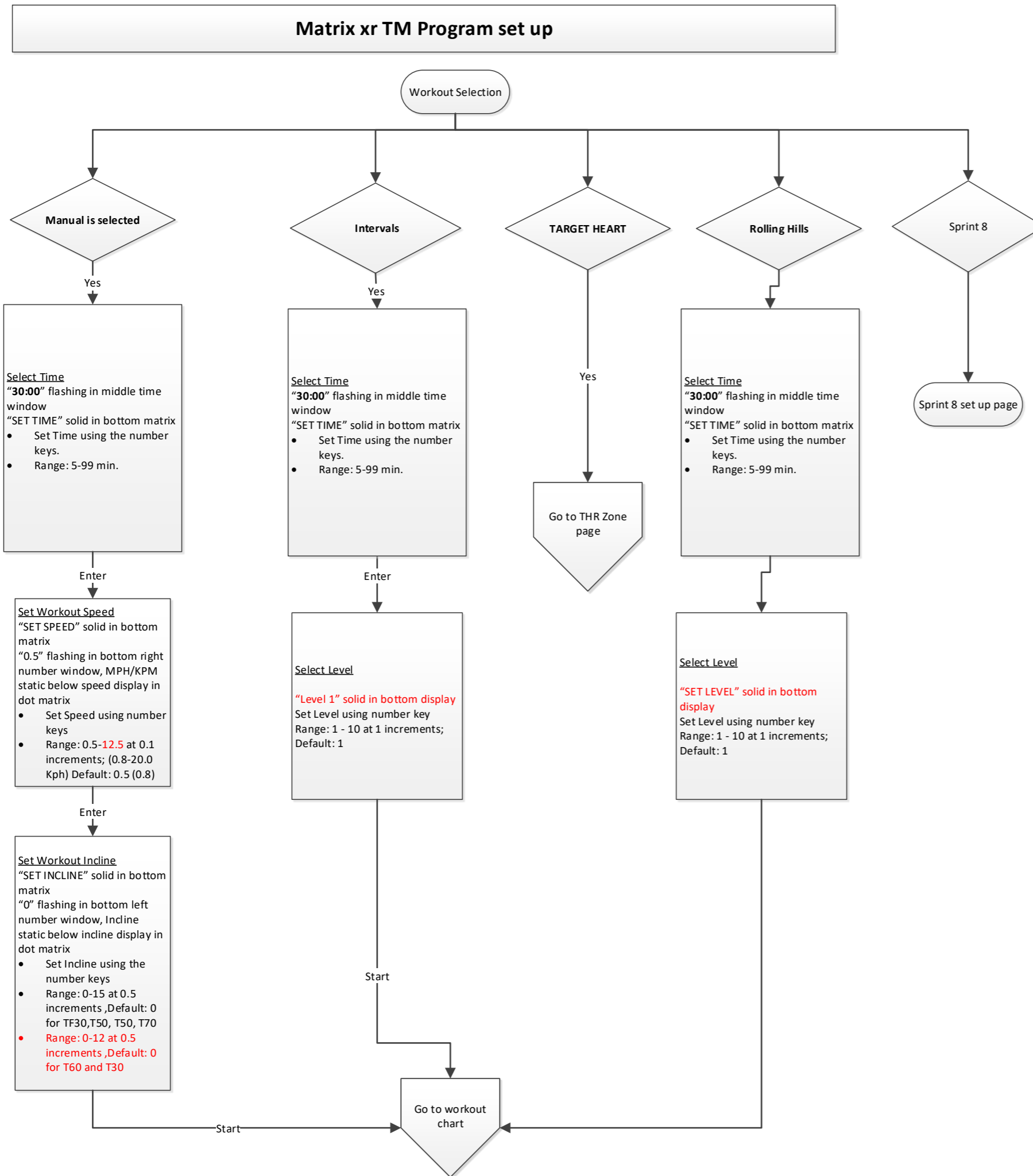
TM

Bike/EP/Ascent 30 series

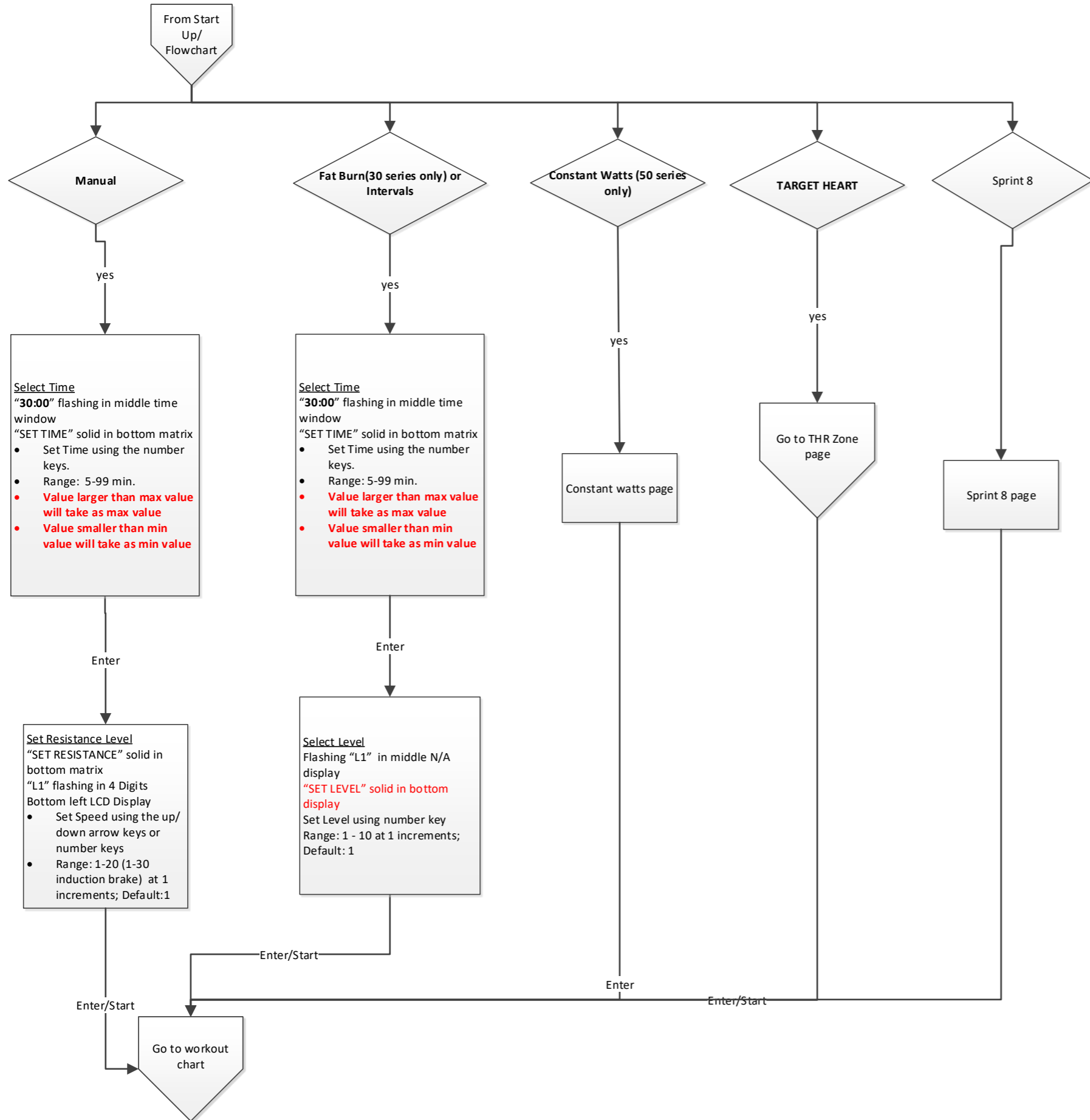
Bike/EP/Ascent 50 series

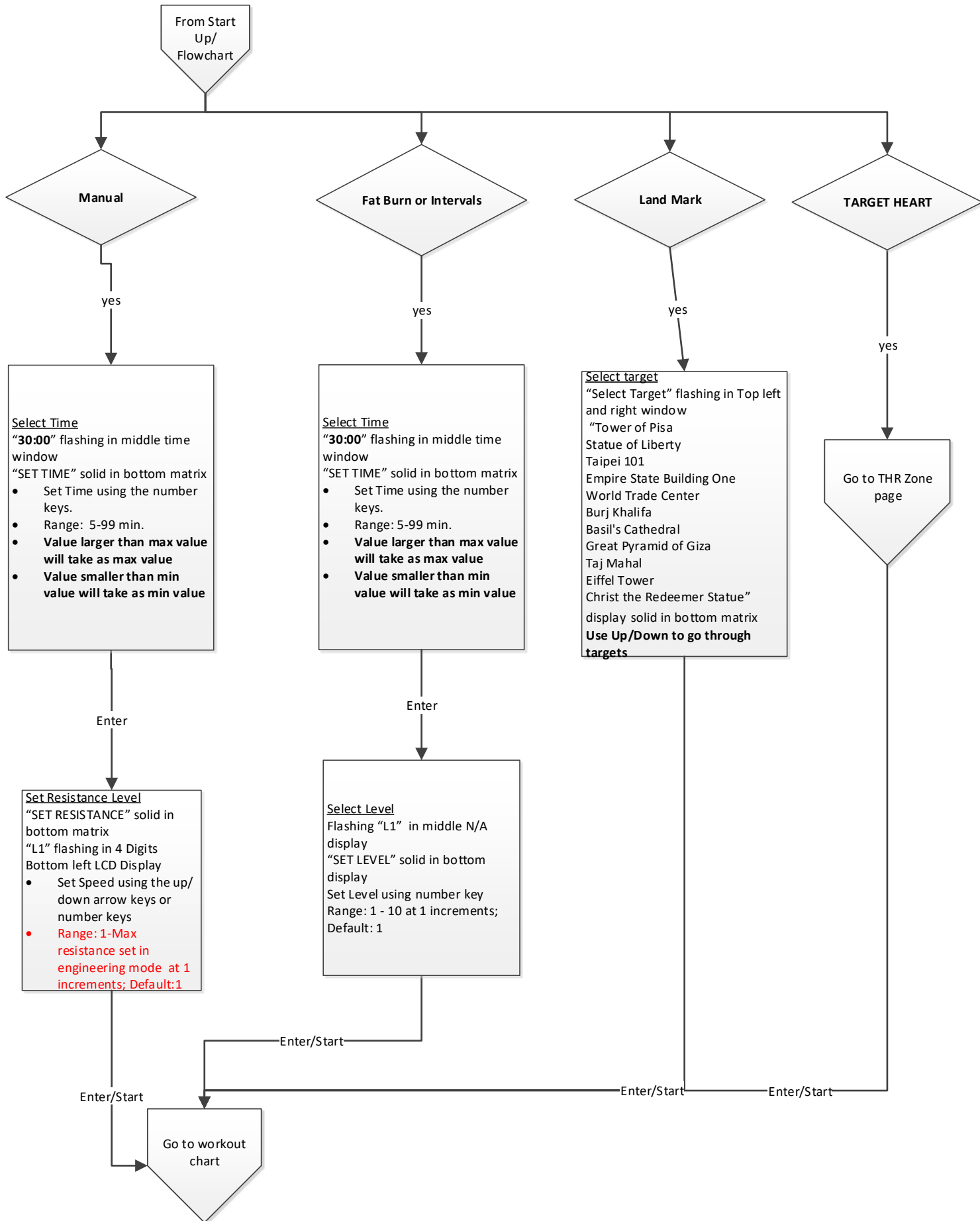
C90

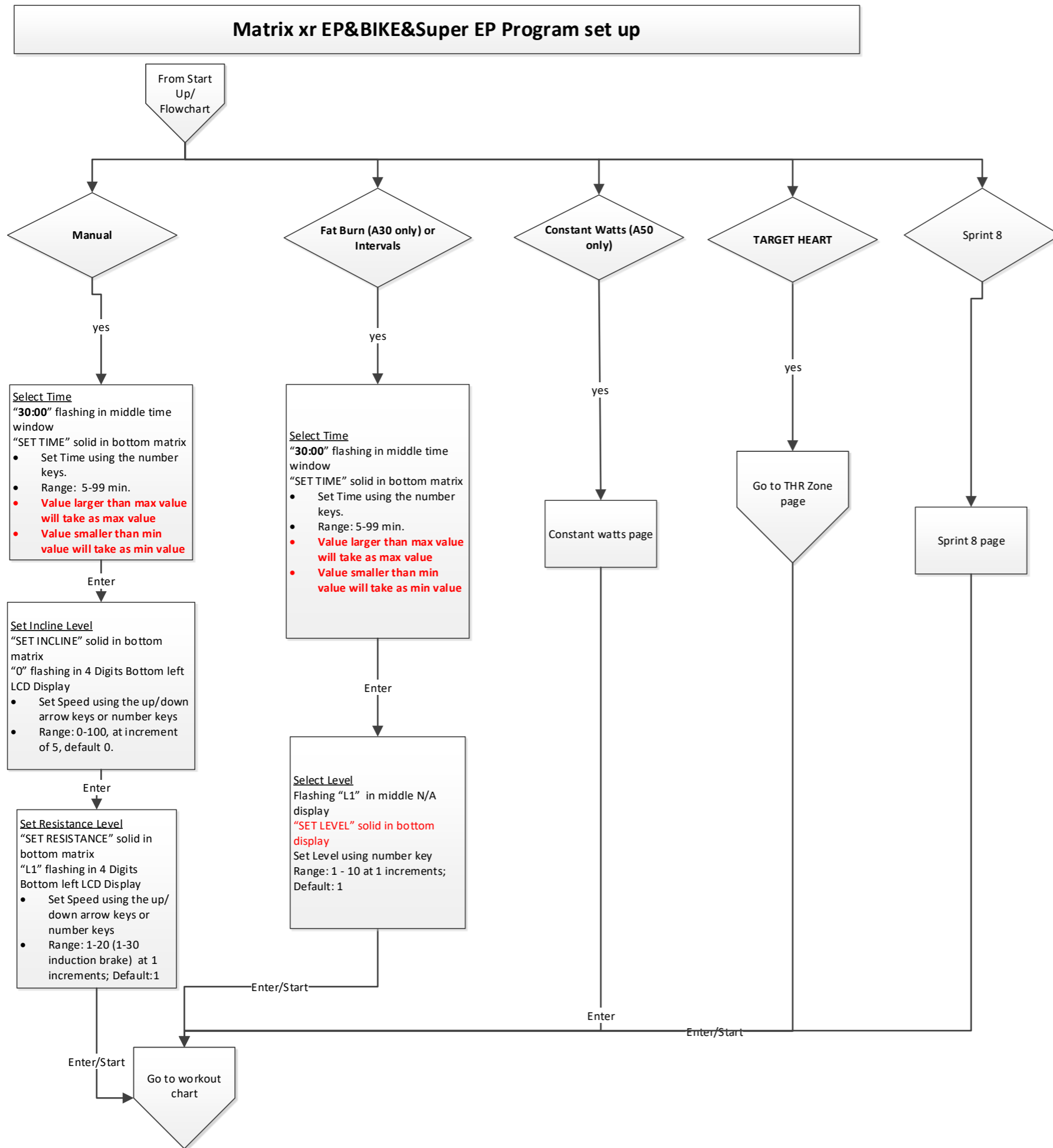




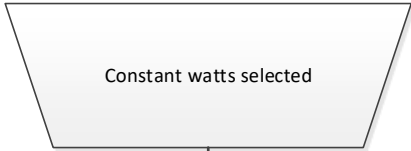
Matrix xr EP&BIKE&Super EP Program set up







Constant Watts (for U/R/E/A 50 only)



ENTER

Select Time
 "30:00" flashing in middle time window
 "SET TIME" solid in bottom matrix

- Set Time using the number keys.
- Range: 5-99 min.
- **Value larger than max value will take as max value**
- **Value smaller than min value will take as min value**

ENTER

Select Target Watts
 "50" flashing in Top left Number window
 "SET Watts" solid in bottom matrix

- Set target watts using the number keys or up/down arrow key.
- Range: 25~400, increment = 5.
- **Value larger than max value will take as max value**
- **Value smaller than min value will take as min value**

START

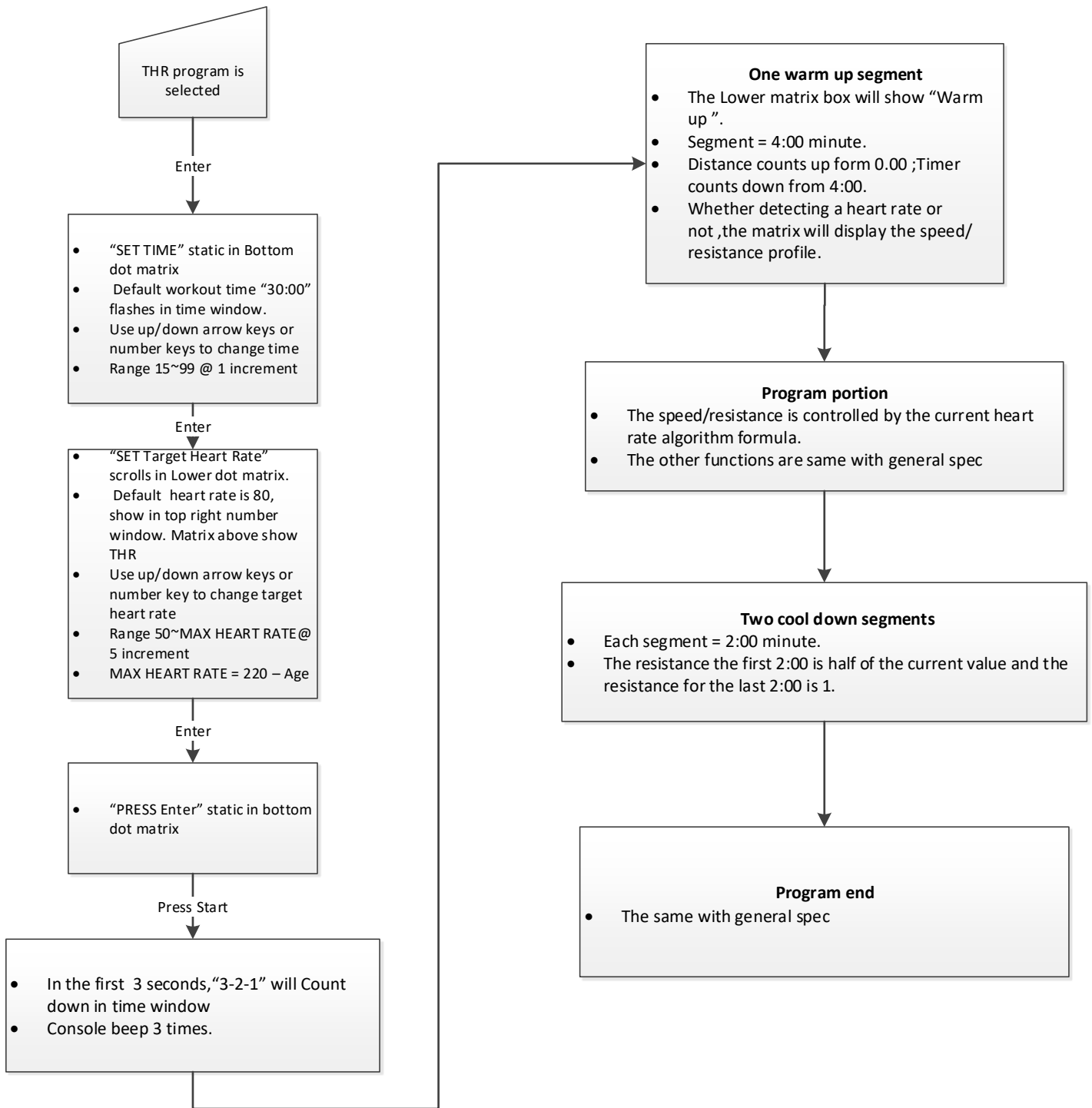
Program portion

- *The timer counts down if set for 5:00-99:00.
- Each segment = the selected time / the number of segment.
- User can change the incline at any time.
- Distance counts up from 0.00 .
- The program adjusts the resistance so that if the user pedals quickly, the resistance goes easier; if the user pedals slower, the resistance gets harder. In order to keep constant watts.
- If the resistance +/- buttons are pressed, the Target Watts are changed, NOT the resistance
- The resistance changes every 10 seconds based on the average RPM for the last 5 seconds
- The maximum resistance change is ½ the max resistance.
- Resistance profile is default .
 - Pressing ENTER or CHANGE DISPLAY can alternate between resistance and incline profile.
 - If the INCLINE values change by any way, the console will show INCLINE profile for 5 seconds, then back to show primary profile.

Program Ends

- Console beeps 3 times.
- All the final values display in the window until console resets,
- Console resets 30 seconds after program ends and beeps twice at the same time

THR Zone



Program Notes

- If no heart rate is detected, the resistance shall remain the same.
- The resistance can be adjusted at any time by the user including warm up and cool down
- If the h.r. exceeds the target by more than 25 such that the console is reset, the program will act as though the program has ended.
- The first segment of cool down is ½ the current height, not ½ the maximum height reached during the program.

THR Zone

Ver.

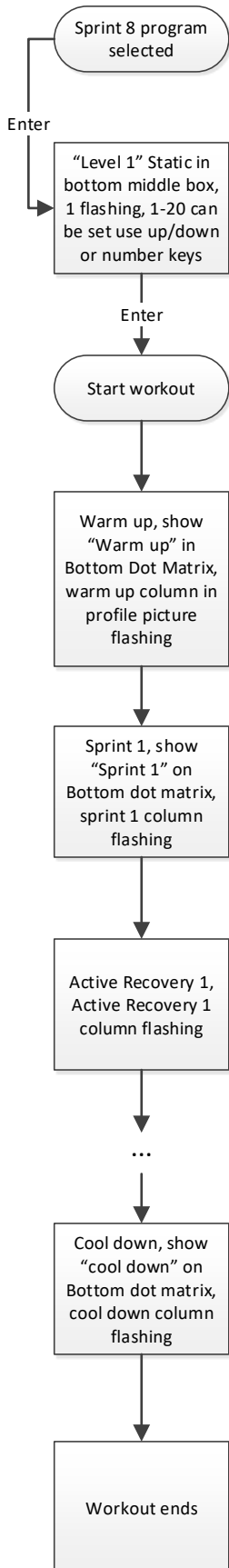
The resistance/speed should function according to chart below.

Note: During warm up and cool down, the user will select the resistance, it will not change per the chart

Heart Rate	Resistance Function	Resistance Adjust
Resistance adjust 2		
Heart Rate	Incline Function	Resistance Adjust
20+ under target	Increase every 10 seconds	1.00
6-19 under target	Increase every 35 seconds	1.00
+/- 5 of target	No change	0.00
6-10 over target	Decrease every 35 seconds	-1.00
11-19 over target	Decrease every 10 seconds	-1.00
20-24 over target	Decrease every 10 seconds	Half of current
25+ over target	Console reset	Workout End
Speed adjust		
Heart Rate	Speed Function	Speed Adjust
12+ under target	Increase every 3 seconds	0.1
7-11 under target	Increase every 5 seconds	0.1
4-6 under target	Increase every 8 seconds	0.1
3 under to 3 over	No change	0.0
4-6 over target	Decrease every 8 seconds	-0.1
7-11 over target	Decrease every 5 seconds	-0.1
12-15 over target	Decrease every 3 seconds	-0.1
16-24 over target	Decrease every 2 seconds	-0.1
25+ over target	Console reset	Console Reset
EN957		
The loss of heart rate signal shall result in speed remaining at the same level for maximum 60s and then decrease until the minimum speed is reached. The rate of decrease shall be at least 1 km/h in 20 s.		
Speed adjust for TM, decreasing 0.6 MPH / 1.0 KPH every 10 seconds until min speed is reached.		
Resistance adjust for EP/Bike/Ascent trainer decreasing 1 level every 10 seconds until min resistance is reached.		

Ver.

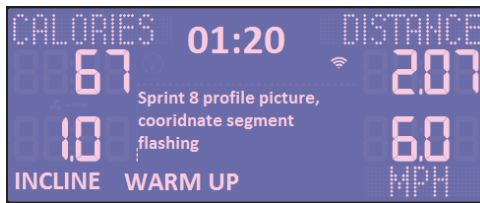
Sprint 8



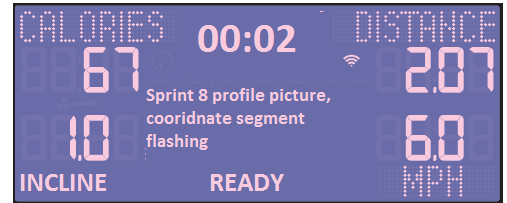
Setting Screen

Profile picture will change while level is changed

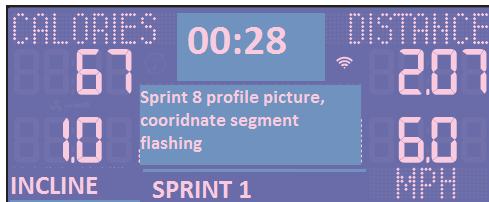
If speed/incline/resistance is changed, the new setting will be used for remaining sprint/ active recovery, but should not affect each other. Warm up/ cool down will only affect themselves.



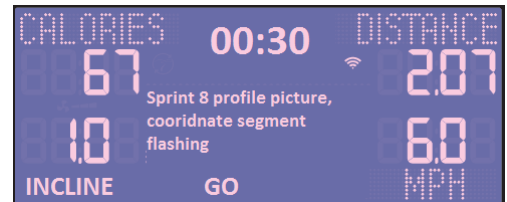
Warm up



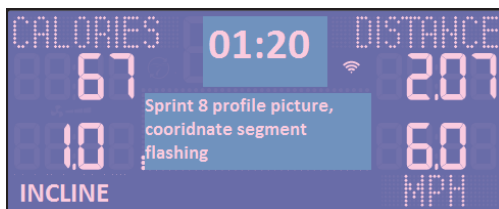
Ready for Sprint



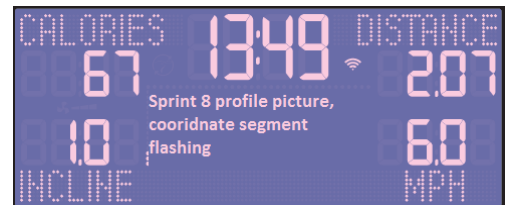
Sprint screen



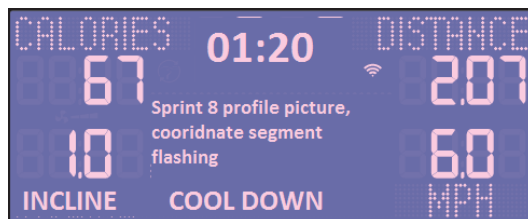
Go for Sprint, Flash "GO" for 5 seconds



Active Recovery screen



Secondary Screen (change display)



Cool Down Screen

*note: speed/incline/resistance need to ramp up before sprint section start. To ensure speed/incline/resistance meet requirement at beginning of workout.
 *note: console need to display "Ramping Up" during ramp up duration. At last 3 seconds, console need to display "Ready", "Set", "Go"

Landmark

Ver.



Land Mark Workout profile picture

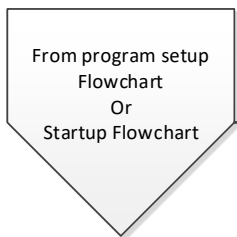


Land Mark Workout screen

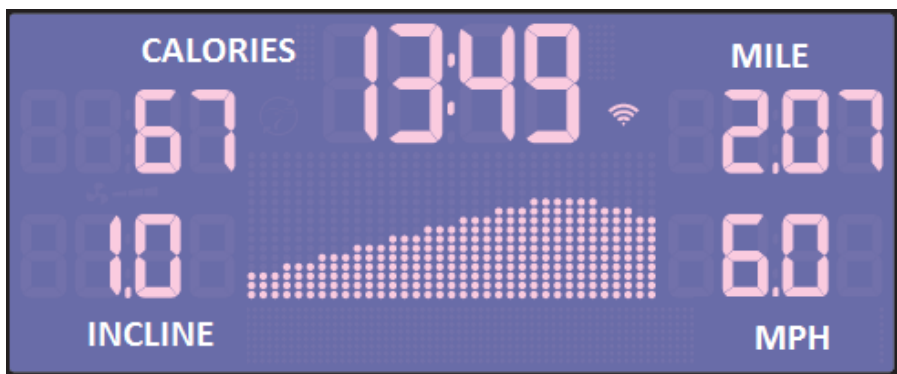


Large number Display

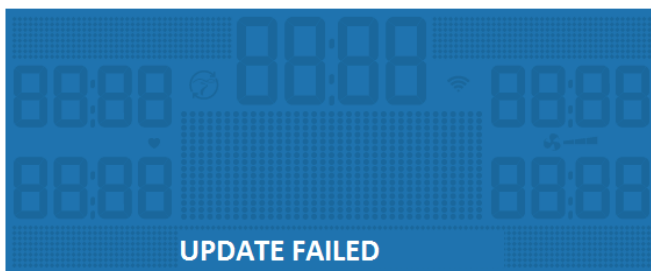
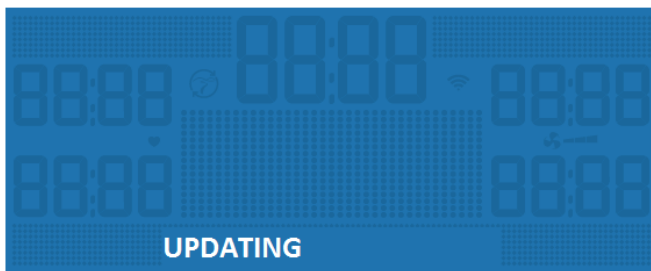
Matrix xr Workout Flowchart



Please refer to TM general spec_C.vsd for TM or refer to EP Bike general spec_C.vsd for more detail.
All the other details which are not emphasized in this document shall keep agreement with TM/EP BIKE general spec-C.vsd



- 1,Detail screen requirement please see screen tab.
- 2,Workout Summary Page same as Workout page when workout finish. Press change display button to switch.



Lube Belt

When model type selected to TF30, TF50, T50, **T30,T60**, console need to follow below flow to indicate user need to lube belt

Preventative Maintenance Message (PMM)

- Using the Accumulated Distance function, the console will scroll the message “LUBE BELT” every **300 miles**.
- If the treadmill does not have scrolling text, “LUBE” will appear in the Time window. Or “LUBE BELT” if there are two 4 digit windows. See below for axample
- The error message will not turn on during a program. It will only turn on after a program has ended and before a program has started.
- The error message will not turn on if the safety key is off.
- If any button is pressed the error message will turn off and the console will return to normal operation. After a program has been run for at least 0.1 miles, the message will return after the program has ended and the console reset.
- If the Stop and Speed + buttons are both held for 5 seconds, the error message will reset and not turn on again for another **300 miles**.
- Note: the PMM can be reset at anytime even before **300 miles** is reached.

Total Clear Message	Speed+ and Stop hold down for 5S
Temp clear message	message get dismissed by pressing any key. But when workout done or console reset, lube belt message will show again.

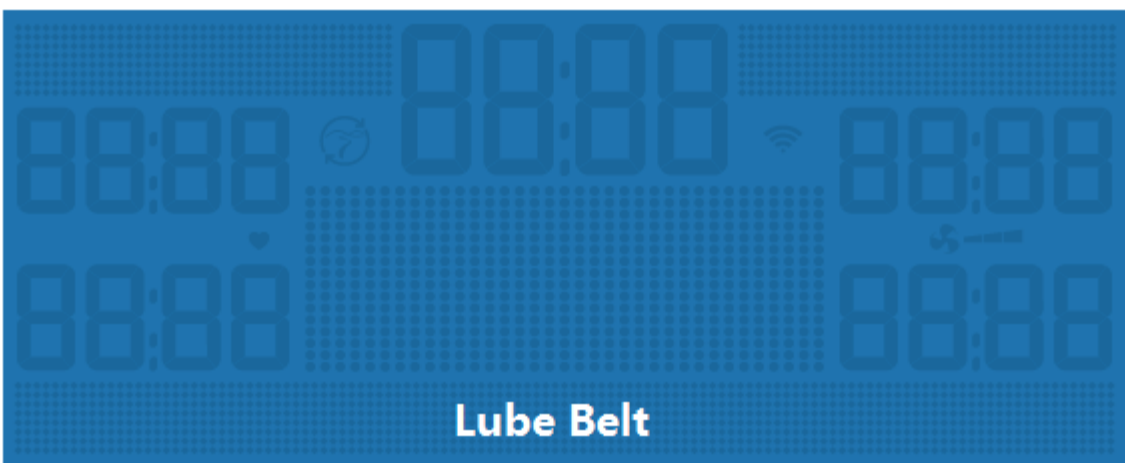
Lube Chain

When model type selected to C90, console need to follow below flow to indicate user need to lube Chain

Preventative Maintenance Message (PMM)

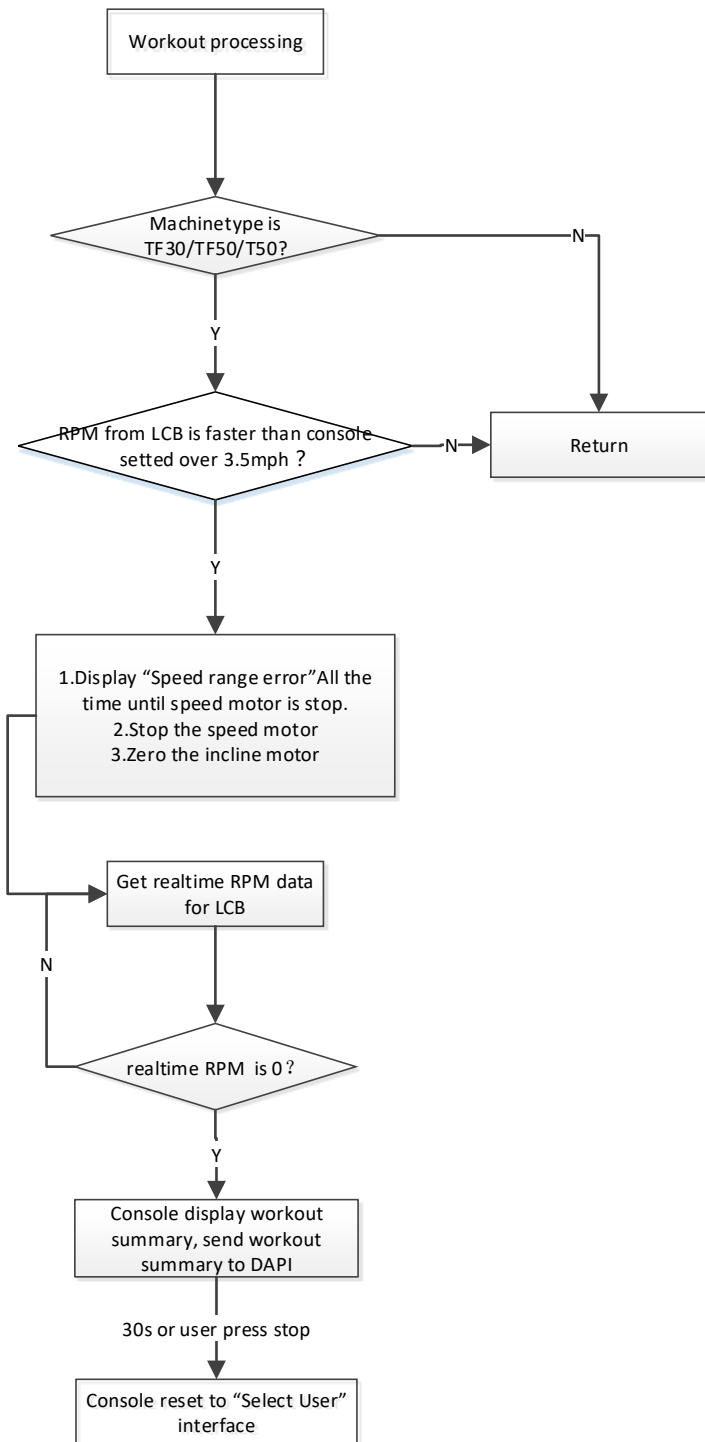
- Using the Accumulated Distance function, the console will scroll the message “LUBE CHAIN” every **1080 Hours**.
- If the treadmill does not have scrolling text, “LUBE” will appear in the Time window. Or “LUBE BELT” if there are two 4 digit windows. See below for axample
- The error message will not turn on during a program. It will only turn on after a program has ended and before a program has started.
- The error message will not turn on if the safety key is off.
- If any button is pressed the error message will turn off and the console will return to normal operation. After a program has been run for at least 0.1 hours, the message will return after the program has ended and the console reset.
- If the Stop and Speed + buttons are both held for 5 seconds, the error message will reset and not turn on again for another **1080 Hours**.
- Note: the PMM can be reset at anytime even before **1080 Hours** is reached.

Total Clear Message	Speed+ and Stop hold down for 5S
Temp clear message	message get dismissed by pressing any key. But when workout done or console reset, lube belt message will show again.

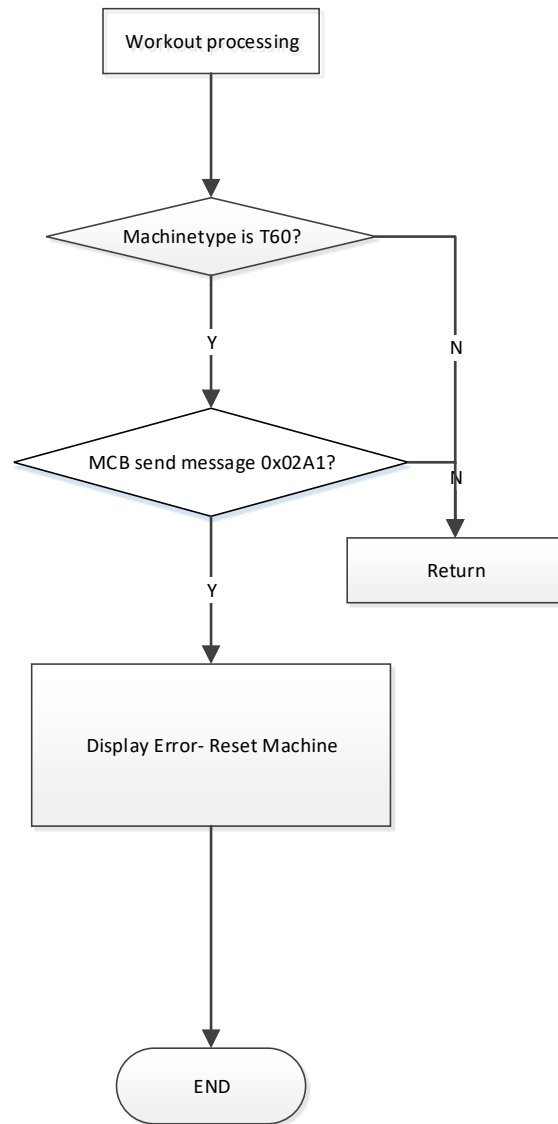


Over Speed detection

T30/TF30/T50/TF50



T60



Passport 2

Connect to Passport 2 player

Method 1

- Connect Console to same network as Passport 2 player

Connect to Passport 2 player

Method 2

- Hold wifi button for 3 second to put wifi to AP mode
-Connect Passport 2 player to console network

* refer to Passport 2 flowchart for more detail

TM interval table

% Max Elevation	Level	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Segment	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1.5	1.5	1.5	1.5	1.5
0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	4	1.5	2	2	2.5	3	3	3.5	3.5	4	4.5	5	5.5	5.5	6	6	6.5	7	7	8	8.5
0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6	2.5	2.5	3	3.5	4	4.5	4.5	5	5.5	6	7	7.5	8	8	8.5	9.5	9.5	10	11	11.5
0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	8	3	3.5	4	4.5	5	5.5	6	6.5	7	8	9	9.5	10	10.5	11	12	12.5	13	14	15
0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	10	3	3.5	4	4.5	5	5.5	6	6.5	7	8	9	9.5	10	10.5	11	12	12.5	13	14	15
0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	12	3	3.5	4	4.5	5	5.5	6	6.5	7	8	9	9.5	10	10.5	11	12	12.5	13	14	15
0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	14	3	3.5	4	4.5	5	5.5	6	6.5	7	8	9	9.5	10	10.5	11	12	12.5	13	14	15
0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	16	3	3.5	4	4.5	5	5.5	6	6.5	7	8	9	9.5	10	10.5	11	12	12.5	13	14	15

*Note: If Machine is set to T75 and T30, Any Incline larger than 12% will be changed to 12%

Interval induction break EP/Bike

Level	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Segment	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance
1	1	1	1	4	4	5	5	5	6	6	6	7	7	7	10	10	10	11	11	12
2	4	5	5	5	6	6	6	6	7	7	10	10	10	11	11	12	13	16	17	18
3	1	1	4	4	4	5	5	5	6	6	6	7	7	7	10	10	10	11	11	12
4	5	5	6	6	6	7	7	10	10	10	11	11	12	12	14	16	18	18	20	22
5	1	1	4	4	4	5	5	5	6	6	6	7	7	7	10	10	10	11	11	12
6	5	6	6	7	8	10	10	11	11	12	12	14	14	16	16	18	22	22	23	24
7	1	4	4	5	6	6	6	6	7	7	7	10	10	10	11	11	11	12	14	16
8	6	6	7	10	11	12	12	14	16	17	18	20	22	23	24	24	25	28	29	30
9	1	4	4	5	6	6	6	6	7	7	7	10	10	10	11	11	11	12	13	16
10	6	6	7	10	11	12	12	14	16	17	18	20	22	23	24	24	25	28	29	30
11	1	4	4	5	6	6	6	6	7	7	7	10	10	10	11	11	11	12	13	16
12	6	6	7	10	11	12	12	14	16	17	18	20	22	23	24	24	25	27	29	30
13	1	4	4	5	6	6	6	6	7	7	7	10	10	10	11	11	11	12	13	16
14	4	5	6	6	8	7	10	10	11	11	12	12	14	14	16	17	18	20	22	23
15	1	1	1	4	3	5	5	5	6	6	6	7	7	7	10	10	10	11	11	12
16	1	1	1	4	3	5	5	5	6	6	6	7	7	7	10	10	10	11	11	12

Change the incline & resistance every segment (workout time/16) Induction Break

Interval ECB Bike/EP

Level \ Segment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance
1	1	1	1	3	3	3	4	4	4	4	4	5	5	5	6	6	7	7	7	8
2	3	3	4	4	4	4	4	4	5	5	6	6	6	7	7	8	9	11	12	12
3	1	1	3	3	3	3	3	3	4	4	4	5	5	5	6	6	6	7	7	8
4	3	4	4	4	4	5	5	7	7	7	7	7	8	8	9	11	12	12	13	15
5	1	1	3	3	3	3	3	3	4	4	4	5	5	5	6	6	6	7	7	8
6	3	4	4	5	5	7	7	7	7	8	8	9	9	11	11	12	15	15	15	16
7	1	3	3	4	4	4	4	4	5	5	5	7	7	7	7	7	7	8	9	11
8	4	4	5	7	7	8	8	9	11	11	12	13	15	15	16	16	17	19	19	20
9	1	3	3	3	4	4	4	4	5	5	5	7	7	7	7	7	7	8	9	11
10	4	4	4	7	7	8	8	9	11	11	12	13	15	15	16	16	17	19	19	20
11	1	3	3	3	4	4	4	4	5	5	5	7	7	7	7	7	7	8	9	11
12	4	4	5	7	7	8	8	9	11	11	12	13	15	15	16	16	17	19	19	20
13	1	3	3	3	4	4	4	4	5	5	5	7	7	7	7	7	7	8	9	11
14	3	3	4	4	5	5	7	7	7	8	8	8	9	9	11	11	12	13	15	16
15	1	1	1	3	3	3	3	3	4	4	4	5	5	5	6	7	7	8	7	8
16	1	1	1	2	3	3	3	3	4	4	4	5	5	5	6	7	7	8	7	8

Change the incline & resistance every segment (workout time/16) ECB

Fat burn table for ECB Bike/EP/Ascent trainer

Level	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Segment	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance	resistance
1	1	1	3	3	4	4	5	5	6	6	8	8	9	9	10	10	11	11	13	14
2	4	4	5	6	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	19
3	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
4	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
5	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
6	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
7	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
8	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
9	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
10	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
11	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
12	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
13	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
14	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	16	16	18	19	20
15	4	4	5	6	6	8	8	9	9	10	10	11	11	13	13	14	14	15	15	19
16	1	1	3	3	4	4	5	5	6	6	8	8	9	9	10	10	11	11	13	14
Change the incline every segment (workout time/16) ECB																				

TM rolling hill table

% Max Elevation	Level Segment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation	elevation
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1.5	1.5	1.5	1.5	1.5
20	3	0.5	1	1	1	1	1	1.5	1.5	1.5	2	2	2	2	2.5	2.5	2.5	3	3	3	3.5
30	4	1	1	1.5	1.5	1.5	2	2	2	2.5	2.5	3	3	3.5	3.5	3.5	4	4	4.5	4.5	5
40	5	1.5	1.5	2	2	2	2.5	2.5	3	3	3.5	4	4	4.5	4.5	5	5.5	5.5	6	6	6.5
20	6	0.5	1	1	1	1	1	1.5	1.5	1.5	2	2	2	2	2.5	2.5	2.5	3	3	3	3.5
0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1.5	1.5	1.5	1.5	1.5
50	9	1.5	2	2	2.5	3	3	3.5	3.5	4	4.5	5	5.5	5.5	6	6	6.5	7	7	8	8.5
80	10	2.5	3	3.5	4	4.5	5	5.5	6	6	7	8	8.5	9	9.5	10	10.5	11	11.5	12.5	13.5
90	11	3	3.5	4	4.5	5	5.5	6	6.5	7	8	9	9.5	10	10.5	11	12	12.5	13	14	15
70	12	2.5	2.5	3	3.5	4	4.5	4.5	5	5.5	6	7	7.5	8	8	8.5	9.5	9.5	10	11	11.5
30	13	1	1	1.5	1.5	1.5	2	2	2	2.5	2.5	3	3	3.5	3.5	3.5	4	4	4.5	4.5	5
0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	15	1	1	1.5	1.5	1.5	2	2	2	2.5	2.5	3	3	3.5	3.5	3.5	4	4	4.5	4.5	5
40	16	1.5	1.5	2	2	2	2.5	2.5	3	3	3.5	4	4	4.5	4.5	5	5.5	5.5	6	6	6.5
Change the incline every segment (workout time/16)																					

*Note: If Machine is set to T75 and T30, Any Incline larger than 12% will be changed to 12%

Rolling Hill ECB

Table with 20 columns (Level 1-20) and 2 rows (elevation, resistance) for each level, representing Rolling Hill ECB workout data.

Change the incline & resistance every segment (workout time/16) ECB

Rolling hill Induction break

Table with 20 columns (Level 1-20) and 2 rows (elevation, resistance) for each level, representing Rolling Hill Induction Break workout data.

Change the incline & resistance every segment (workout time/16) Induction Break

ECB Bike/EP sprint 8

Sprint 8																		
	Time	180 (Warm up)	30	90	30	90	30	90	30	90	30	90	30	90	30	90	30	150 (Cool Down)
Level 1	Resistance	1	2	1	2	1	3	1	3	1	4	1	4	1	4	1	4	1
Level 2	Resistance	1	3	1	3	1	4	1	4	1	5	1	5	1	5	1	5	1
Level 3	Resistance	1	4	1	4	1	5	1	5	1	6	1	6	1	6	1	6	1
Level 4	Resistance	1	5	1	5	1	6	1	6	1	7	1	7	1	7	1	7	1
Level 5	Resistance	1	6	1	6	1	7	1	7	1	8	1	8	1	8	1	8	1
Level 6	Resistance	2	6	2	6	2	7	2	7	2	8	2	8	2	8	2	8	2
Level 7	Resistance	2	7	2	7	2	8	2	8	2	9	2	9	2	9	2	9	2
Level 8	Resistance	2	8	2	8	2	9	2	9	2	10	2	10	2	10	2	10	2
Level 9	Resistance	2	8	2	8	2	9	2	9	2	10	2	10	2	11	2	11	2
Level 10	Resistance	2	9	2	9	2	10	2	10	2	11	2	11	2	11	2	11	2
Level 11	Resistance	2	10	2	10	2	11	2	11	2	12	2	12	2	12	2	12	2
Level 12	Resistance	2	11	2	11	2	12	2	12	2	12	2	13	2	13	2	13	2
Level 13	Resistance	2	12	2	12	2	13	2	13	2	13	2	14	2	14	2	14	2
Level 14	Resistance	2	13	2	13	2	14	2	14	2	14	2	15	2	15	2	15	2
Level 15	Resistance	2	14	2	14	2	15	2	15	2	15	2	16	2	16	2	16	2
Level 16	Resistance	3	14	3	14	3	15	3	15	3	16	3	16	3	16	3	16	3
Level 17	Resistance	3	15	3	15	3	16	3	16	3	17	3	17	3	17	3	17	3
Level 18	Resistance	3	16	3	16	3	17	3	17	3	18	3	18	3	18	3	18	3
Level 19	Resistance	3	17	3	17	3	18	3	18	3	19	3	19	3	19	3	19	3
Level 20	Resistance	3	18	3	18	3	19	3	19	3	20	3	20	3	20	3	20	3
Time in Seconds																		

Induction Bike/EP sprint 8

Sprint 8																			
	Time	180 (Warm up)	30	90	30	90	30	90	30	90	30	90	30	90	30	90	30	150 (Cool Down)	
Level 1	Resistance	1	3	1	3	1	4	1	4	1	6	1	6	1	6	1	6	1	6
Level 2	Resistance	1	4	1	4	1	5	1	5	1	7	1	7	1	7	1	7	1	7
Level 3	Resistance	1	5	1	5	1	6	1	6	1	8	1	8	1	8	1	8	1	8
Level 4	Resistance	1	6	1	6	1	7	1	7	1	9	1	9	1	9	1	9	1	9
Level 5	Resistance	1	7	1	7	1	8	1	8	1	10	1	10	1	10	1	10	1	10
Level 6	Resistance	2	8	2	8	2	9	2	9	2	11	2	11	2	11	2	11	2	11
Level 7	Resistance	2	9	2	9	2	10	2	10	2	12	2	12	2	12	2	12	2	12
Level 8	Resistance	2	10	2	10	2	11	2	11	2	13	2	13	2	13	2	13	2	13
Level 9	Resistance	2	11	2	11	2	12	2	12	2	14	2	14	2	14	2	14	2	14
Level 10	Resistance	2	12	2	12	2	13	2	13	2	15	2	15	2	15	2	15	2	15
Level 11	Resistance	2	13	2	13	2	14	2	14	2	16	2	16	2	16	2	16	2	16
Level 12	Resistance	2	14	2	14	2	15	2	15	2	17	2	17	2	17	2	17	2	17
Level 13	Resistance	2	15	2	15	2	16	2	16	2	18	2	18	2	18	2	18	2	18
Level 14	Resistance	2	16	2	16	2	17	2	17	2	19	2	19	2	19	2	19	2	19
Level 15	Resistance	2	17	2	17	2	18	2	18	2	20	2	20	2	20	2	20	2	20
Level 16	Resistance	3	18	3	18	3	19	3	19	3	21	3	21	3	21	3	21	3	21
Level 17	Resistance	3	19	3	19	3	20	3	20	3	22	3	22	3	22	3	22	3	22
Level 18	Resistance	3	20	3	20	3	21	3	21	3	23	3	23	3	23	3	23	3	23
Level 19	Resistance	3	21	3	21	3	22	3	22	3	24	3	24	3	24	3	24	3	24
Level 20	Resistance	3	22	3	22	3	23	3	23	3	25	3	25	3	25	3	25	3	25
Time in Seconds																			

Engineering Mode and First Boot

Note:

1. All the setting were based on our exist console software
2. added the HOME or CLUB setting at the first setting

In Engineer 3 model **only for Club**.

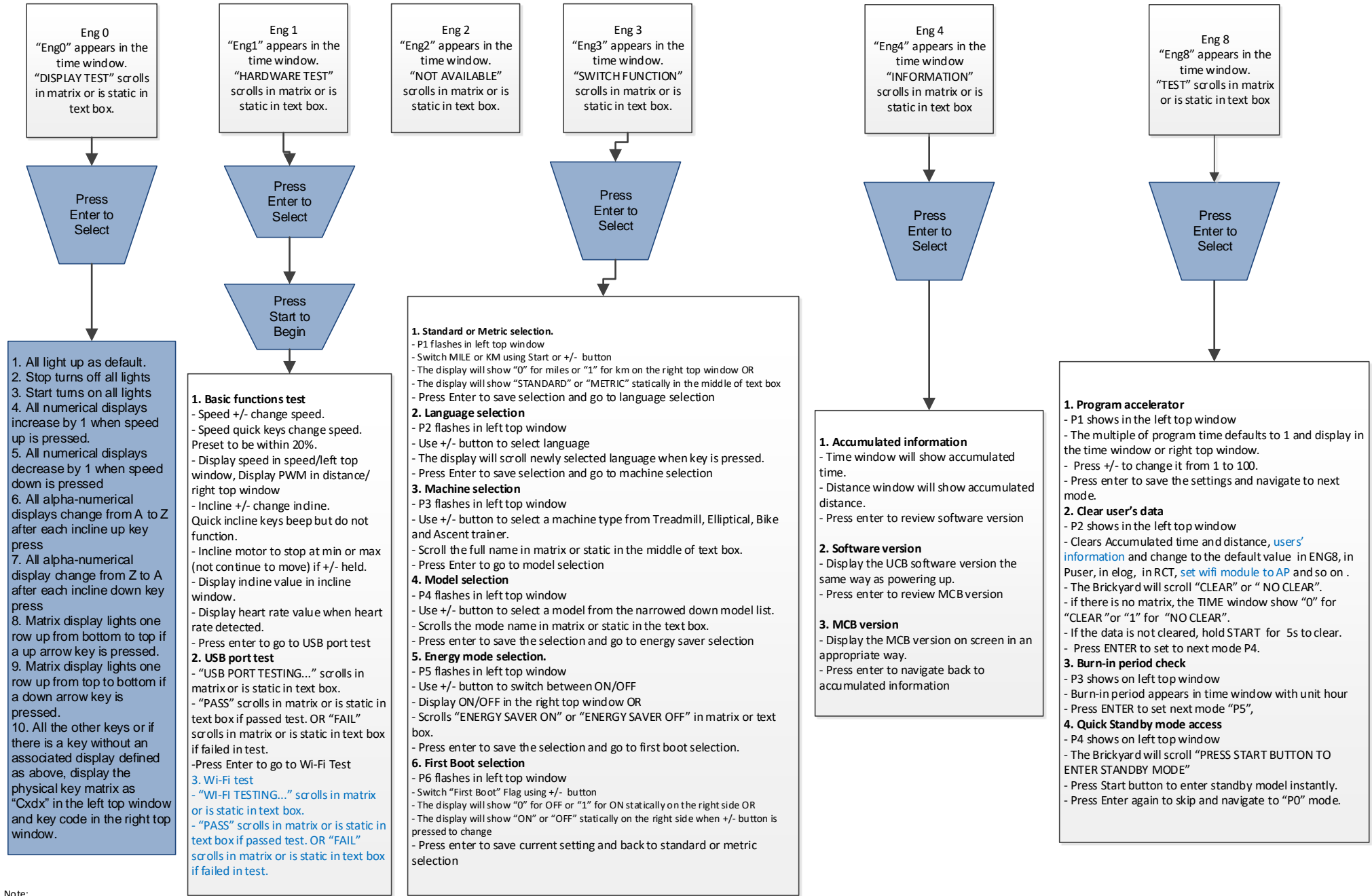
a. **Default Level** if the setting will used for the user to setup the default level, default is 1.

b. **Out of Order (OFF/ON, default OFF)**, if the console was setup "Out of Order" on, the console should display and scroll the "OUT OF ORDER" all the time, and the console should block all the function except allow the user enter the engineer mode to do setup. Default is OFF.

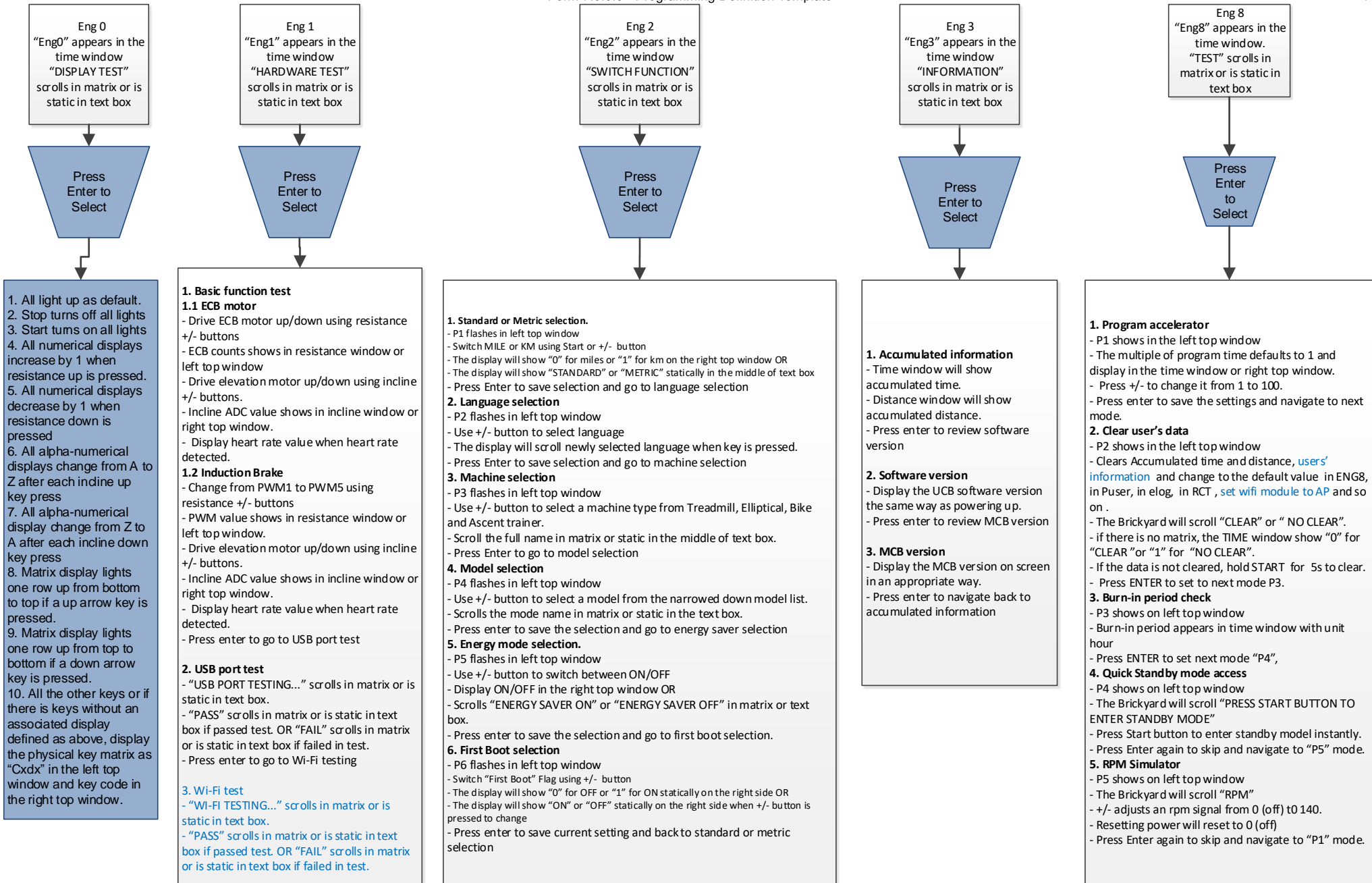
c. **Sound mode (Key press sound. OFF/ON, default ON)**, if set it to OFF, console should not beep when the key pad has been pressed.

d. **Default accumulate distance/time**, this setting to allow the service people to modify the accumulate distance and time for club, the modified data should show in information engineer mode, but the console still need keep the original data for ever. The original data should show on the display when the console go into Default accumulate menu. Default is original Total Accumulate distance/time.

3. In **Club Mode**, only one user slot is shown, user has to manual log in on the console if Wifi is connected. After workout, user information will be deleted automatically on the console and unlink from console on DAPI.



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 3. A text box must be implemented when multi language is available.
 4. Console goes to model selection after cycling the power when First Boot flag is set to ON.
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6. Display items alternatively when a few items needs to be displayed in the same window. Light up the indicator if the indicator exists.
7. The console work for different machine and/or model types.
8. The console will automatically connect to SSID: "JIS FQC TEST" with password "quality".

1. Accumulated information
- Time window will show accumulated time.
- Distance window will show accumulated distance.
- Press enter to review software version

2. Software version
- Display the UCB software version the same way as powering up.
- Press enter to review MCB version

3. MCB version
- Display the MCB version on screen in an appropriate way.
- Press enter to navigate back to accumulated information

1. Program accelerator
- P1 shows in the left top window
- The multiple of program time defaults to 1 and display in the time window or right top window.
- Press +/- to change it from 1 to 100.
- Press enter to save the settings and navigate to next mode.

2. Clear user's data
- P2 shows in the left top window
- Clears Accumulated time and distance, users' information and change to the default value in ENG8, in Puser, in eLog, in RCT, set wifi module to AP and so on.
- The Brickyard will scroll "CLEAR" or "NO CLEAR".
- If there is no matrix, the TIME window show "0" for "CLEAR" or "1" for "NO CLEAR".
- If the data is not cleared, hold START for 5s to clear.
- Press ENTER to set to next mode P3.

3. Burn-in period check
- P3 shows on left top window
- Burn-in period appears in time window with unit hour
- Press ENTER to set next mode "P4",

4. Quick Standby mode access
- P4 shows on left top window
- The Brickyard will scroll "PRESS START BUTTON TO ENTER STANDBY MODE"
- Press Start button to enter standby model instantly.
- Press Enter again to skip and navigate to "P5" mode.

5. RPM Simulator
- P5 shows on left top window
- The Brickyard will scroll "RPM"
- +/- adjusts an rpm signal from 0 (off) to 140.
- Resetting power will reset to 0 (off)
- Press Enter again to skip and navigate to "P1" mode.

Eng 0
"Eng0" appears in the time window
"DISPLAY TEST" scrolls in matrix or is static in text box

Press Enter to Select

1. All light up as default.
2. Stop turns off all lights
3. Start turns on all lights
4. All numerical displays increase by 1 when resistance up is pressed.
5. All numerical displays decrease by 1 when resistance down is pressed
6. All alpha-numerical displays change from A to Z after each incline up key press
7. All alpha-numerical display change from Z to A after each incline down key press
8. Matrix display lights one row up from bottom to top if a up arrow key is pressed.
9. Matrix display lights one row up from top to bottom if a down arrow key is pressed.
10. All the other keys or if there is keys without an associated display defined as above, display the physical key matrix as "Cxdx" in the left top window and key code in the right top window.

Eng 1
"Eng1" appears in the time window
"HARDWARE TEST" scrolls in matrix or is static in text box

Press Enter to Select

- 1. Basic function test**
 - 1.1 ECB motor**
 - Drive ECB motor up/down using resistance +/- buttons
 - ECB counts shows in resistance window or left top window
 - Drive elevation motor up/down using incline +/- buttons.
 - Incline ADC value shows in incline window or right top window.
 - Display heart rate value when heart rate detected.
 - 1.2 Induction Brake**
 - Change from PWM1 to PWM5 using resistance +/- buttons
 - PWM value shows in resistance window or left top window.
 - Drive elevation motor up/down using incline +/- buttons.
 - Incline ADC value shows in incline window or right top window.
 - Display heart rate value when heart rate detected.
 - Press enter to go to USB port test
- 2. USB port test**
 - "USB PORT TESTING..." scrolls in matrix or is static in text box.
 - "PASS" scrolls in matrix or is static in text box if passed test. OR "FAIL" scrolls in matrix or is static in text box if failed in test.
 - Press enter to go to Wi-Fi testing
- 3. Wi-Fi test**
 - "WI-FI TESTING..." scrolls in matrix or is static in text box.
 - "PASS" scrolls in matrix or is static in text box if passed test. OR "FAIL" scrolls in matrix or is static in text box if failed in test.

Eng 3
"Eng3" appears in the time window
"INFORMATION" scrolls in matrix or is static in text box

Press Enter to Select

- 1. Accumulated information**
 - Time window will show accumulated time.
 - Stairs window will show accumulated stairs.
 - Press enter to review software version
- 2. Software version**
 - Display the UCB software version the same way as powering up.
 - Press enter to review MCB version
- 3. MCB version**
 - Display the MCB version on screen in an appropriate way.
 - Press enter to navigate back to accumulated information

Eng 2
"Eng2" appears in the time window
"SWITCH FUNCTION" scrolls in matrix or is static in text box

Press Enter to Select

- 1. Standard or Metric selection.**
 - P1 flashes in left top window
 - Switch MILE or KM using Start or +/- button
 - The display will show "0" for miles or "1" for km on the right top window OR
 - The display will show "STANDARD" or "METRIC" statically in the middle of text box
 - Press Enter to save selection and go to language selection
- 2. Language selection**
 - P2 flashes in left top window
 - Use +/- button to select language
 - The display will scroll newly selected language when key is pressed.
 - Press Enter to save selection and go to machine selection
- 3. Machine selection**
 - P3 flashes in left top window
 - Use +/- button to select a machine type from Treadmill, Elliptical, Bike and Ascent trainer.
 - Scroll the full name in matrix or static in the middle of text box.
 - Press Enter to go to model selection
- 4. Model selection**
 - P4 flashes in left top window
 - Use +/- button to select a model from the narrowed down model list.
 - Scrolls the mode name in matrix or static in the text box.
 - Press enter to save the selection and go to energy saver selection
- 5. Energy mode selection.**
 - P5 flashes in left top window
 - Use +/- button to switch between ON/OFF
 - Display ON/OFF in the right top window OR
 - Scrolls "ENERGY SAVER ON" or "ENERGY SAVER OFF" in matrix or text box.
 - Press enter to save the selection and go to first boot selection.
- 6. First Boot selection**
 - P6 flashes in left top window
 - Switch "First Boot" Flag using +/- button
 - The display will show "0" for OFF or "1" for ON statically on the right side OR
 - The display will show "ON" or "OFF" statically on the right side when +/- button is pressed to change
 - Press enter to save current setting and back to standard or metric selection
- 7. Error Code**
 - Main menu display on/off
 - Default On
 - Use up/down to switch
- 8. Control Zone**
 - Display Control zone on main menu.
 - use up/down to switch
- 9. IR sensor**
 - Display IR sensor on main menu.
 - use up/down to switch
- 10. Max Level**
 - Display the Max Level in Numeric display.
 - default 25, use up/Down to change

Eng 8
"Eng8" appears in the time window.
"TEST" scrolls in matrix or is static in text box

Press Enter to Select

- 1. Program accelerator**
 - P1 shows in the left top window
 - The multiple of program time defaults to 1 and display in the time window or right top window.
 - Press +/- to change it from 1 to 100.
 - Press enter to save the settings and navigate to next mode.
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 6. Display items alternatively when a few items needs to be displayed in the same window. Light up the indicator if the indicator exists.
 7. A Manager can be used to test the console work for different machine and/or model types.
 8. The console will automatically connect to SSID: "JIS FQC TEST" with password "quality".