Electronics India

The Finest Quality Laboratory Instruments

Soil Testing STFR METER

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INSTRUMENT SPECIFICATION:

SR. NO	PARAMETER	RANGE
1	pH	3 – 12 (extremely acidic, strongly acidic, moderately acidic, slightly acidic, neutral, moderately alkaline, strongly alkaline)
2	Electrical Conductivity	0.4 – 1.6 mS/cm
3	Organic Carbon	0 - 1.72% (low, medium, high)
4	Available Nitrogen	0 – 560 kg/Ha (low, medium, high)
5	Available Phosphorous	0 – 80 kg/Ha (low, medium, high, very high)
6	Available Potassium	0 – 400 kg/Ha (low, medium, high, very high)
7	Available Sulphur	1.0 - 150 mg/kg (sufficient/deficient)
8	Available Zinc	0.5 – 10 mg/kg (sufficient/deficient)
9	Available Iron	0.5 – 50 mg/kg ((sufficient/deficient)
10	Available Copper	0.1 – 10 mg/kg (sufficient/deficient)
11	Available Manganese	0.5 – 20 mg/kg (sufficient/deficient)
12	Available Boron	0.1 – 2.0 mg/kg (sufficient/deficient)
13	Lime Requirement	
14	Gypsum Requirement	

KEYPAD

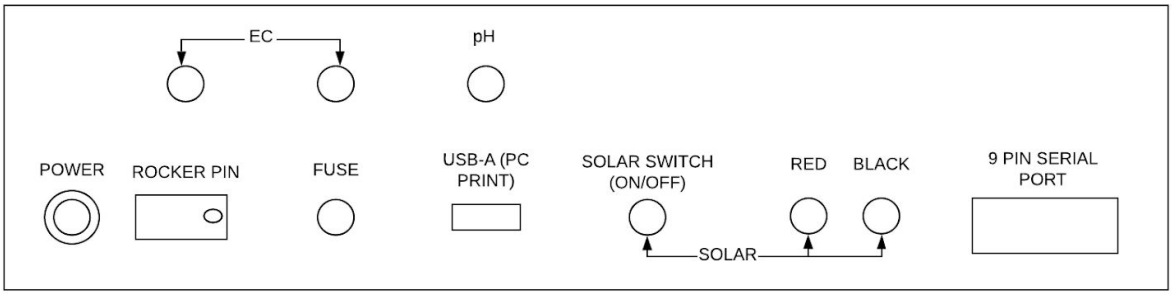
MAIN	1	2	3
UP	4	5	6
DOWN	7	8	9
ESC	.	0	ENTER

SPECIFCATIONS:

1) 4x4 keypad
2) 8 Port lines

DISPLAY
20x4 CHAR
BLUE/WHITE LCD

BACK PANEL



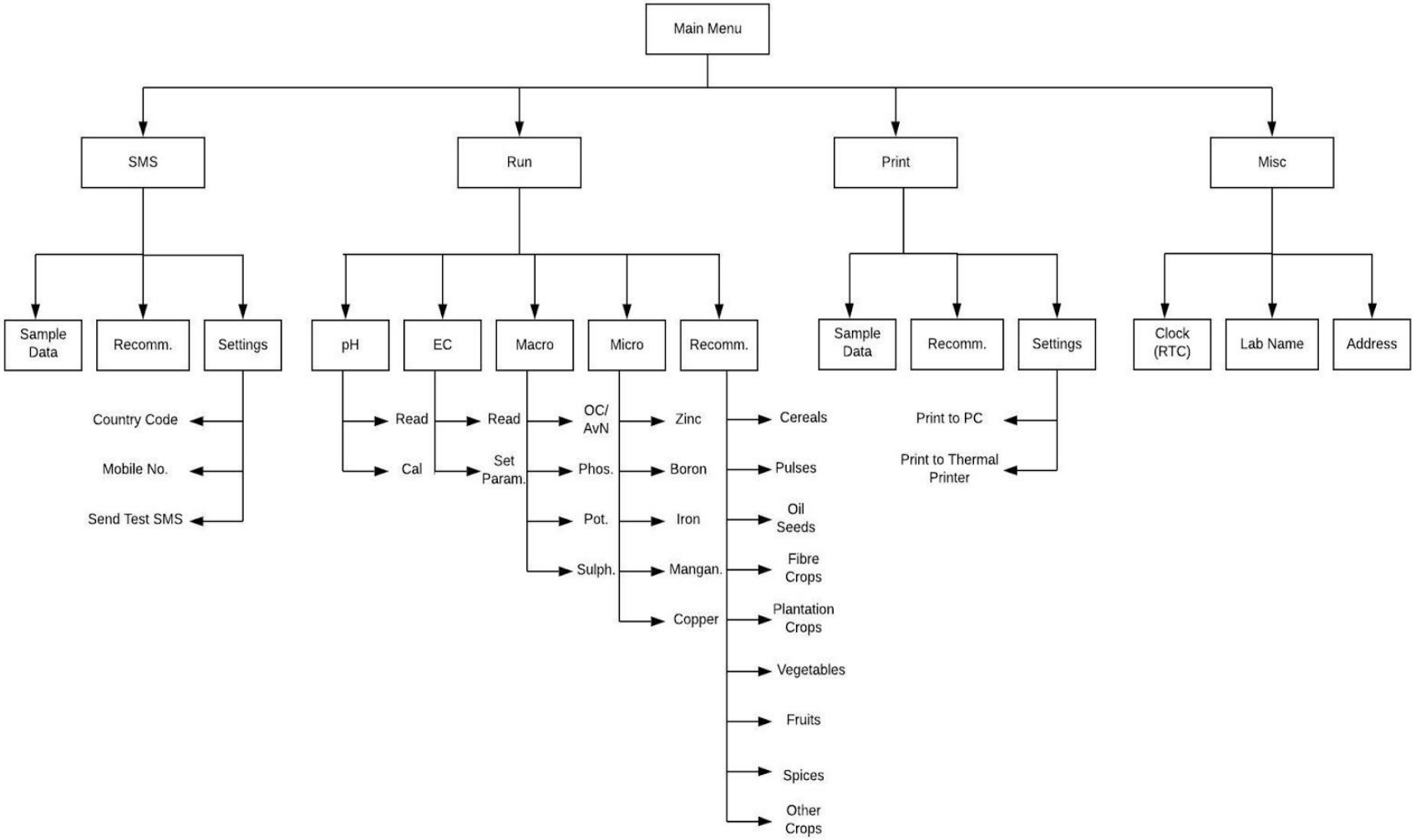
HARDWARE INTERFACING

STRUCTS

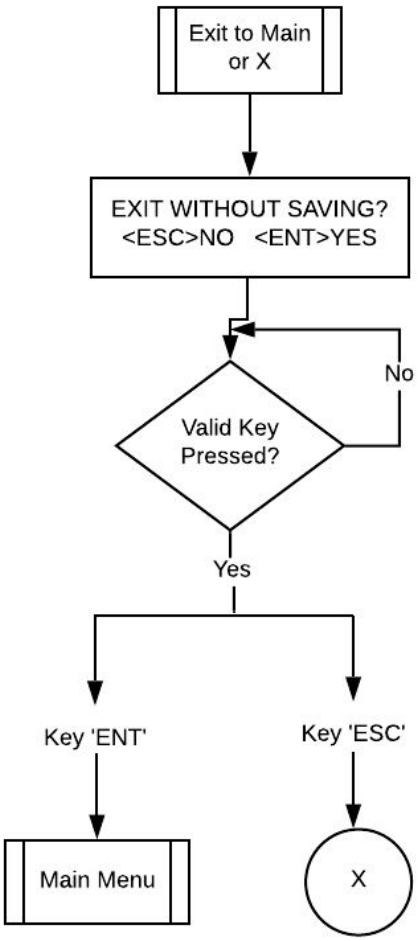
```
/* General struct - For battery backup variables to be retained in memory
Memory usage - 16 + 22 + 11 + 4 + 1 + 1 + 2 = 57 bytes
               (without padding and alignement)*/

struct sttGeneral {
    char chLabName[16];                         // 16 bytes
    char chLabAddressLine1[11];                 // 11 bytes
    char chLabAddressLine2[11];                 // 11 bytes
    char chPhoneNumber[11];                     // 11 bytes
    char chCountryCode[4];                      // 4 bytes
    unsigned char uchBaudRatePC;                // 1 byte
    unsigned char uchBaudRateThermalPrinter;    // 1 byte
    int nLastSampleNumber;                      // 2 bytes
};
```

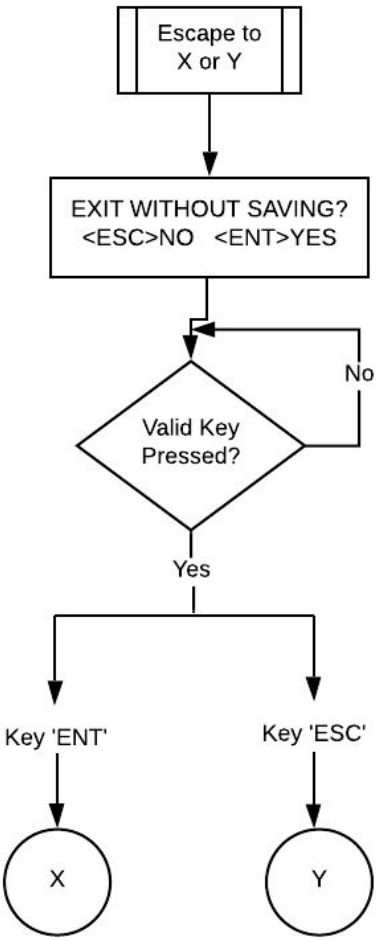
```
/* Calibration Data Struct - For storing calibration data
Memory Usage -  8 * 4 = 32 bytes (without padding and alignment)*/

struct sttCalibrationData {
    float flBuf1pH;                             // 4 bytes
    float flBuf2pH;                             // 4 bytes
    float flBuf1mV;                             // 4 bytes
    float flBuf2mV;                             // 4 bytes
    float flTemperature;                        // 4 bytes
    float flCellConstant;                       // 4 bytes
    float flPotassiumStandard;                  // 4 bytes
    float flSulphurStandard;                    // 4 bytes
};
```

```
/* Results Struct - For sample results based on readings
Memory Usage - 1 + 12 * 4 + 6 + 1 = 56 bytes (without padding and alignment)*/

struct sttSampleResults {
    bool bDeleteFlag;                           // 1 byte
    unsigned char uchRTCData[6];                // 6 bytes
    float flSamplepH;                           // calculate Lime requirement
    float flSampleEC;                           // 4 bytes
    float flOCPercentage;                       // 4 bytes
    float flAvNReading;                         // 4 bytes
    float flPhosphorousReading;                 // 4 bytes
    float flPotassiumReading;                   // 4 bytes
    float flSulphurReading;                     // calculate Gypsum requirement
    float flZincReading;                        // calculate ZnSO_4 requirement
    float flBoronReading;                       // calculate Borax requirement
    float flIronReading;                        // calculate FeSO_4 requirement
    float flManganeseReading;                   // calculate MnSO_4 requirement
    float flCopperReading;                      // calculate CuSO_4 requirement
    unsigned char uchCropIndex;                 // 1 byte
};
```

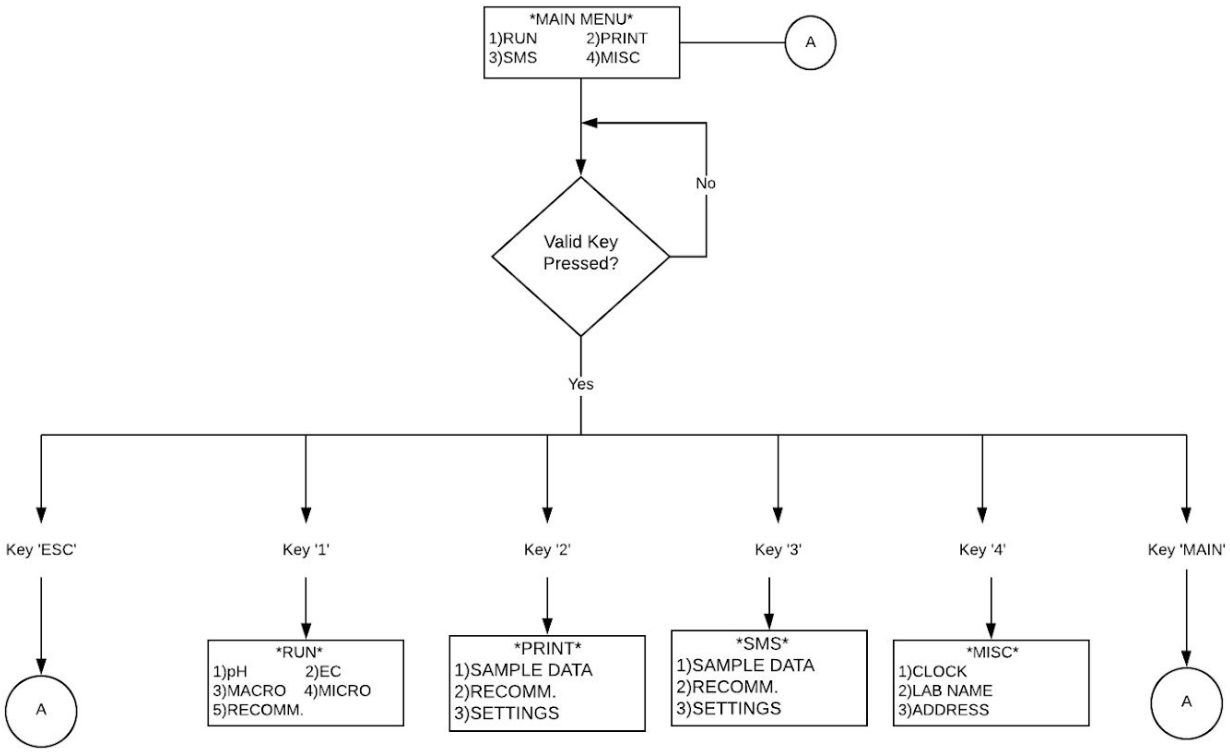

Main Menu
SMS
Run
Print
Misc
Sample Data
Recomm.
Settings
pH
EC
Macro
Micro
Recomm.
Sample Data
Recomm.
Settings
Clock (RTC)
Lab Name
Address
Country Code
Mobile No.
Send Test SMS
Read
Cal
Read
Set Param.
OC/ AvN
Phos.
Pot.
Sulph.
Zinc
Boron
Iron
Mangan.
Copper
Cereals
Pulses
Oil Seeds
Fibre Crops
Plantation Crops
Vegetables
Fruits
Spices
Other Crops
Print to PC
Print to Thermal Printer

COMMON FUNCTION BLOCKS

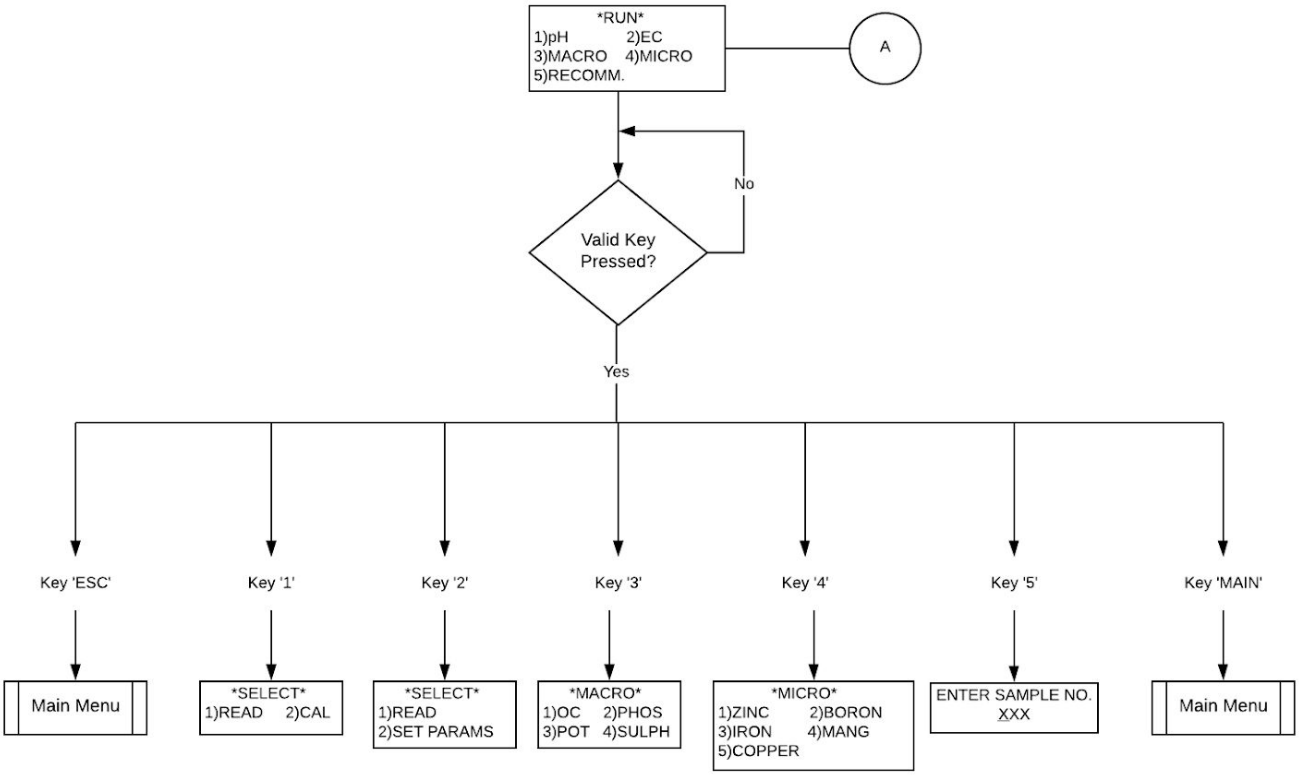




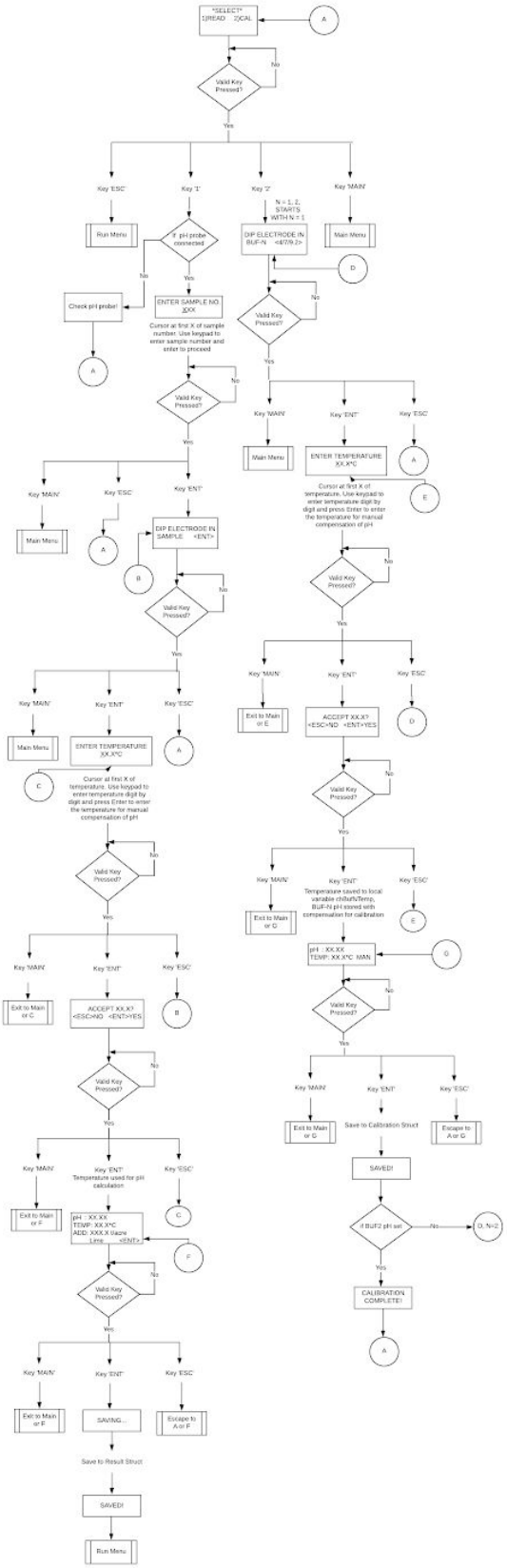
MAIN MENU FLOWCHART



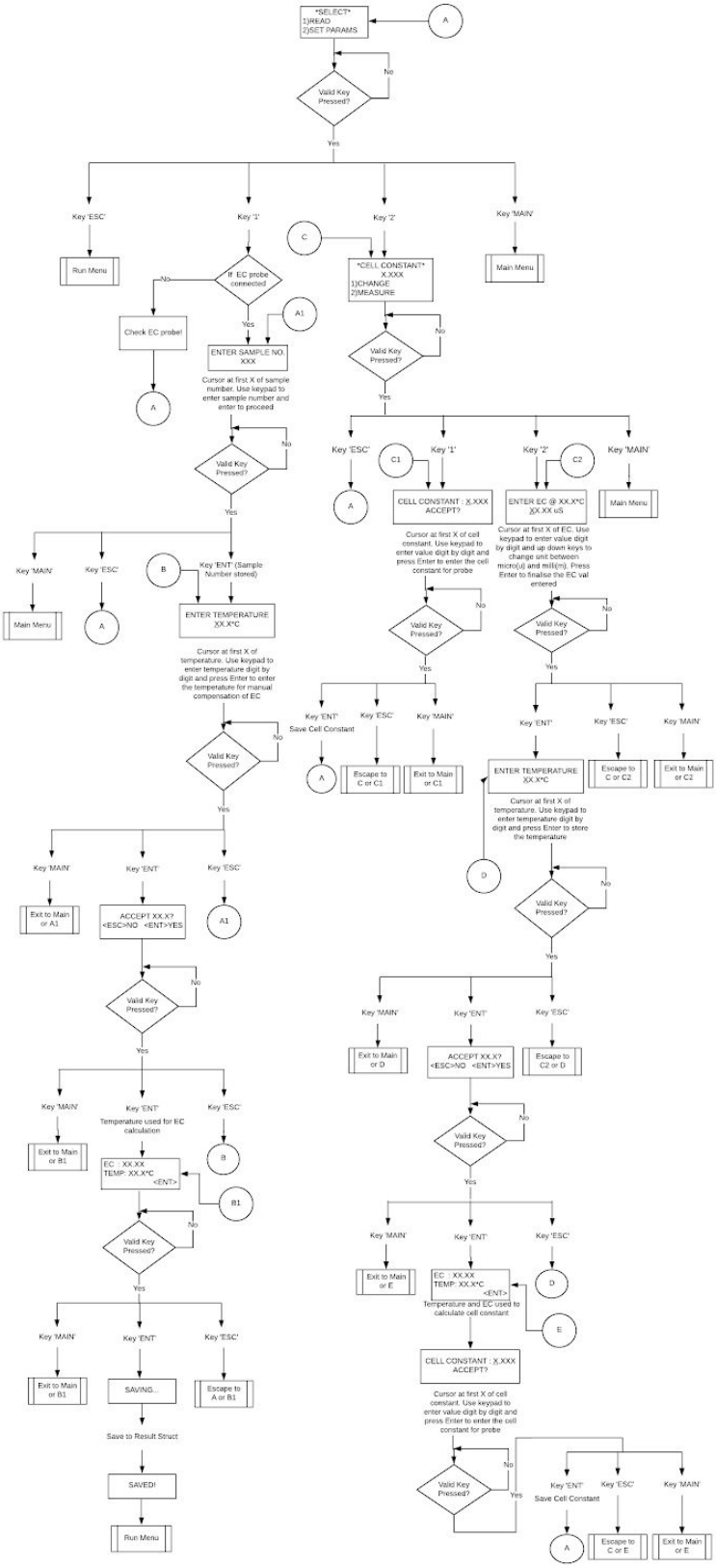
RUN MENU FLOWCHART



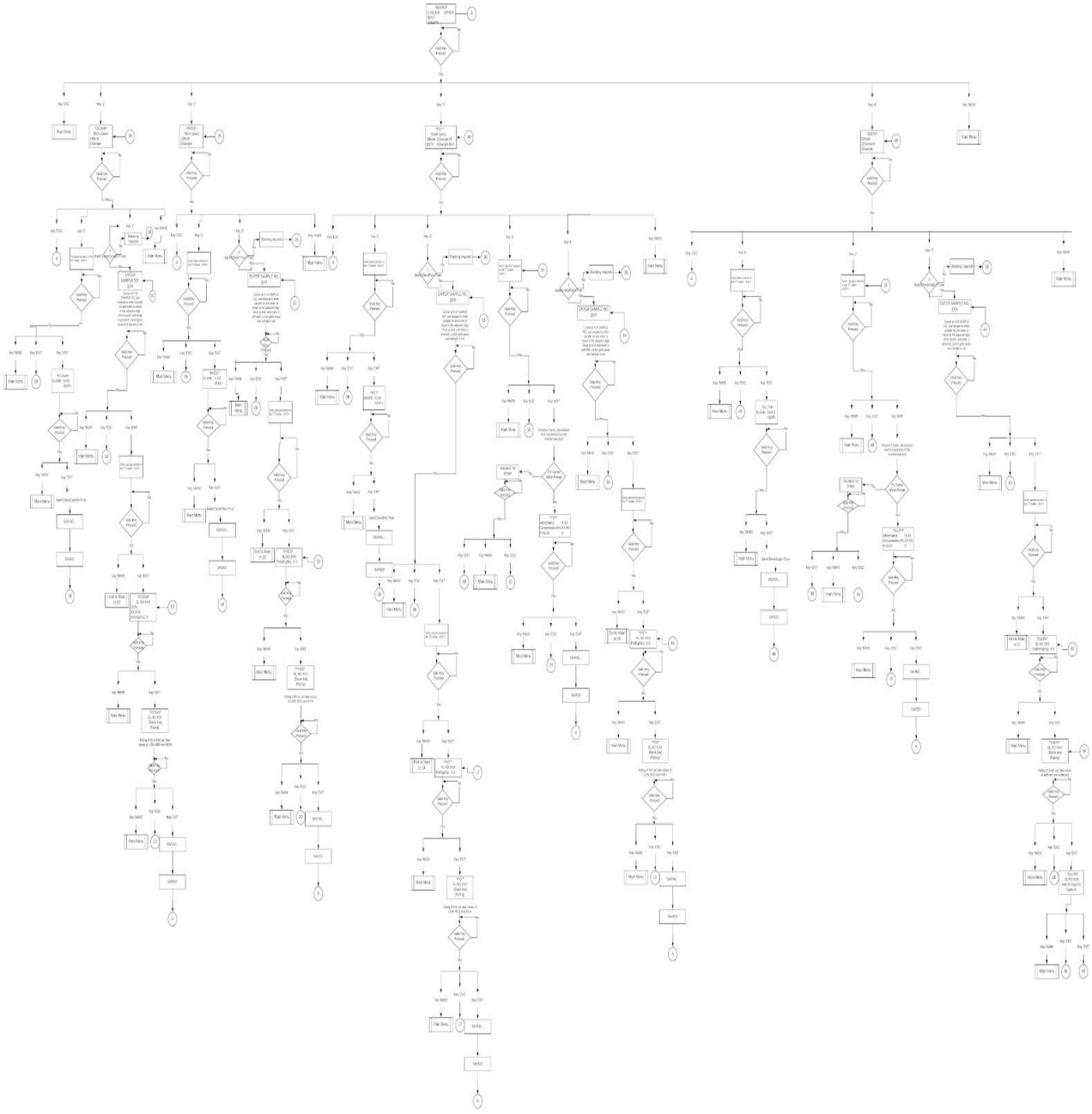
pH MODE FLOWCHART



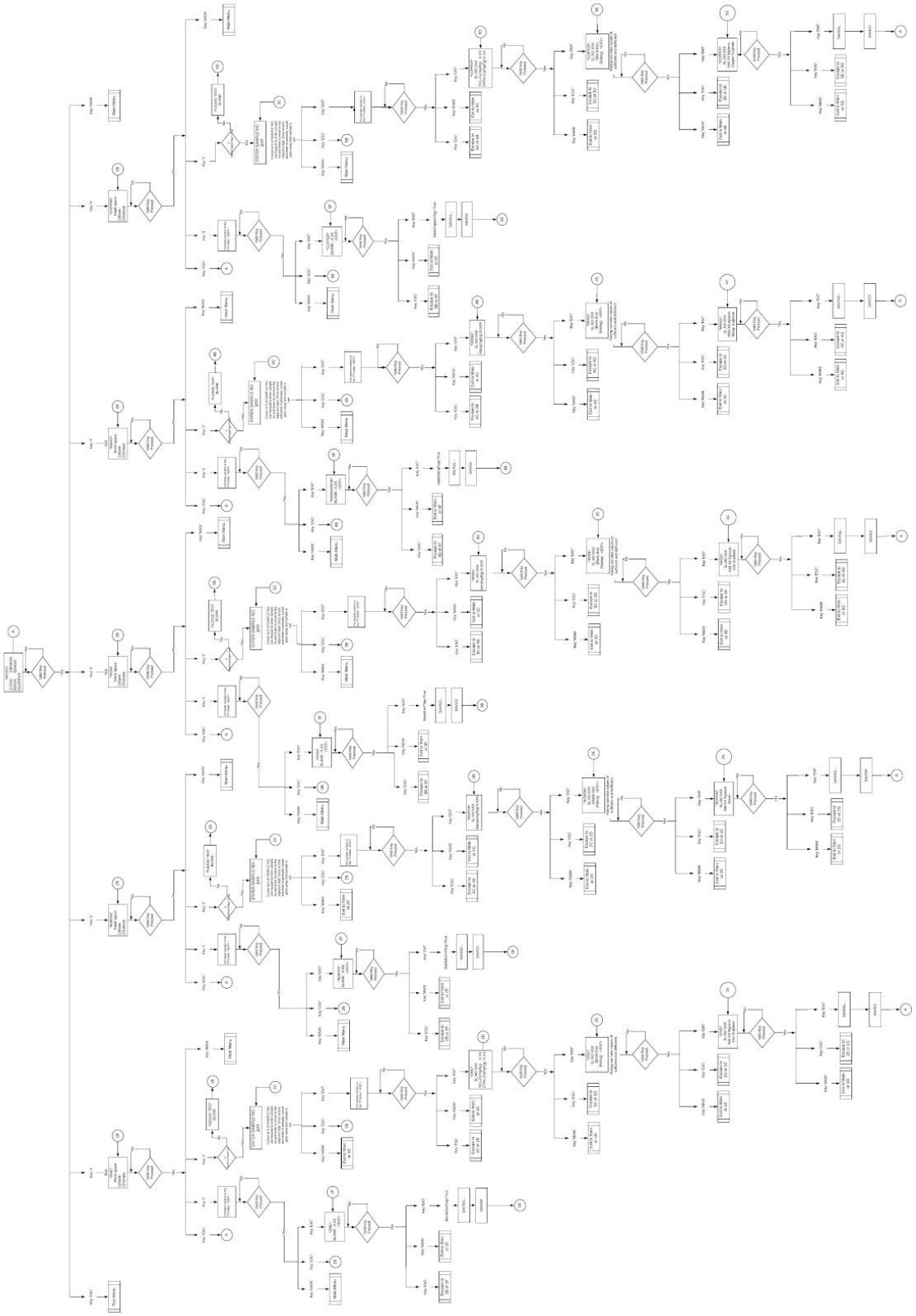
EC MODE FLOWCHART



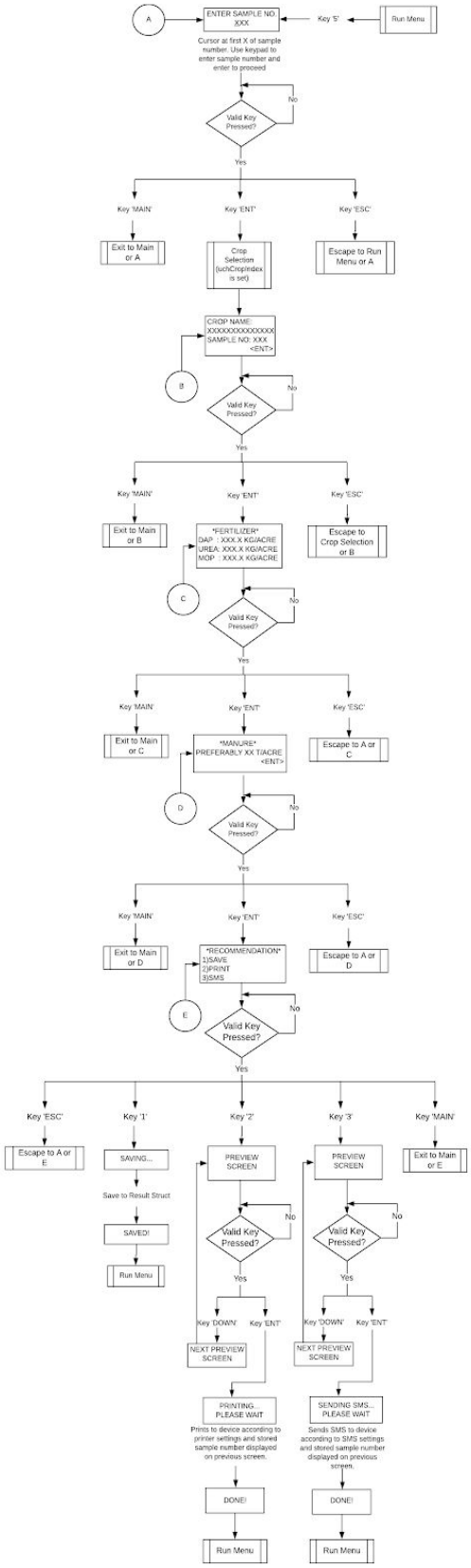
MACRO NUTRIENTS FLOWCHART



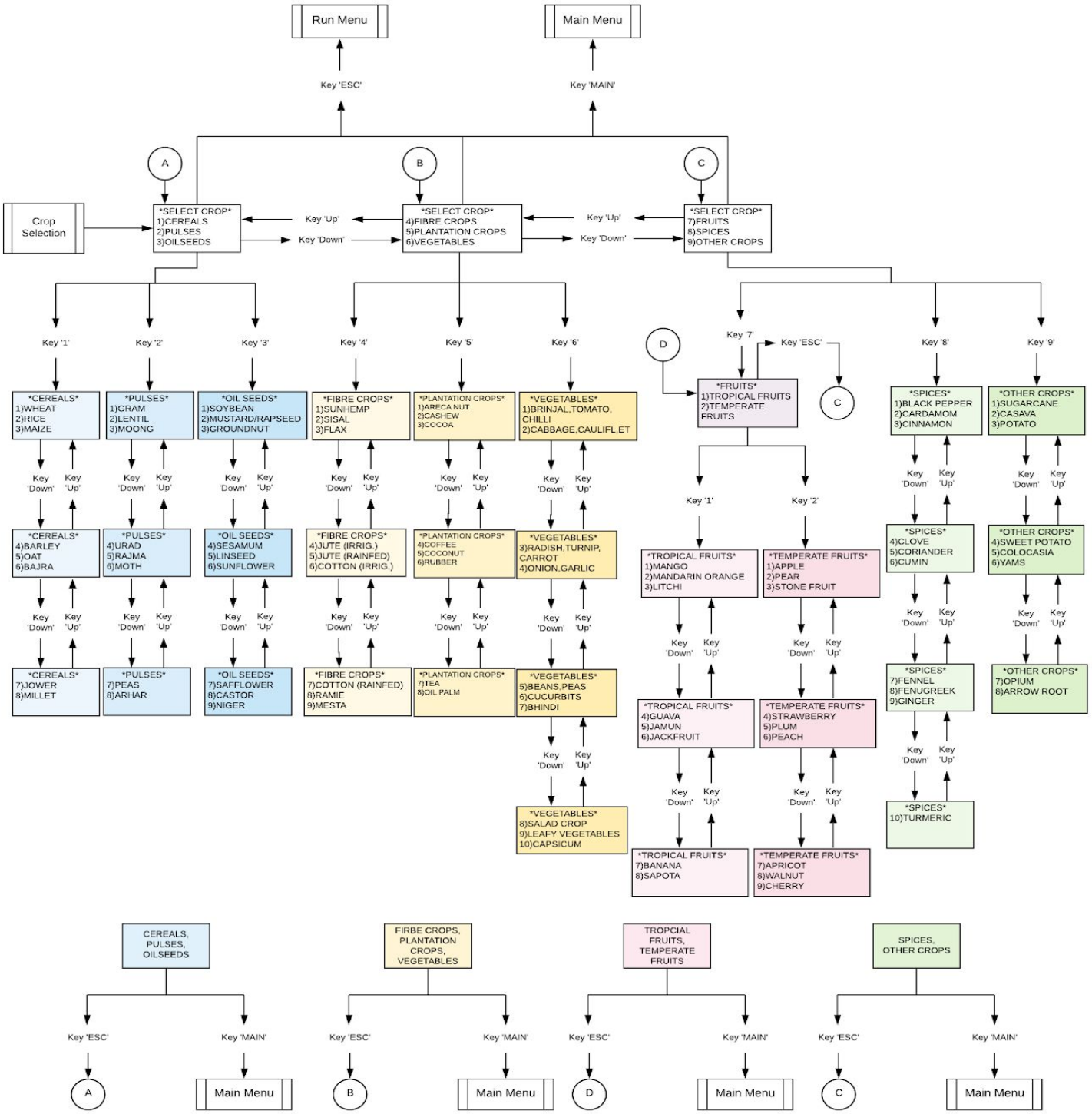
MICRO NUTRIENTS FLOWCHART



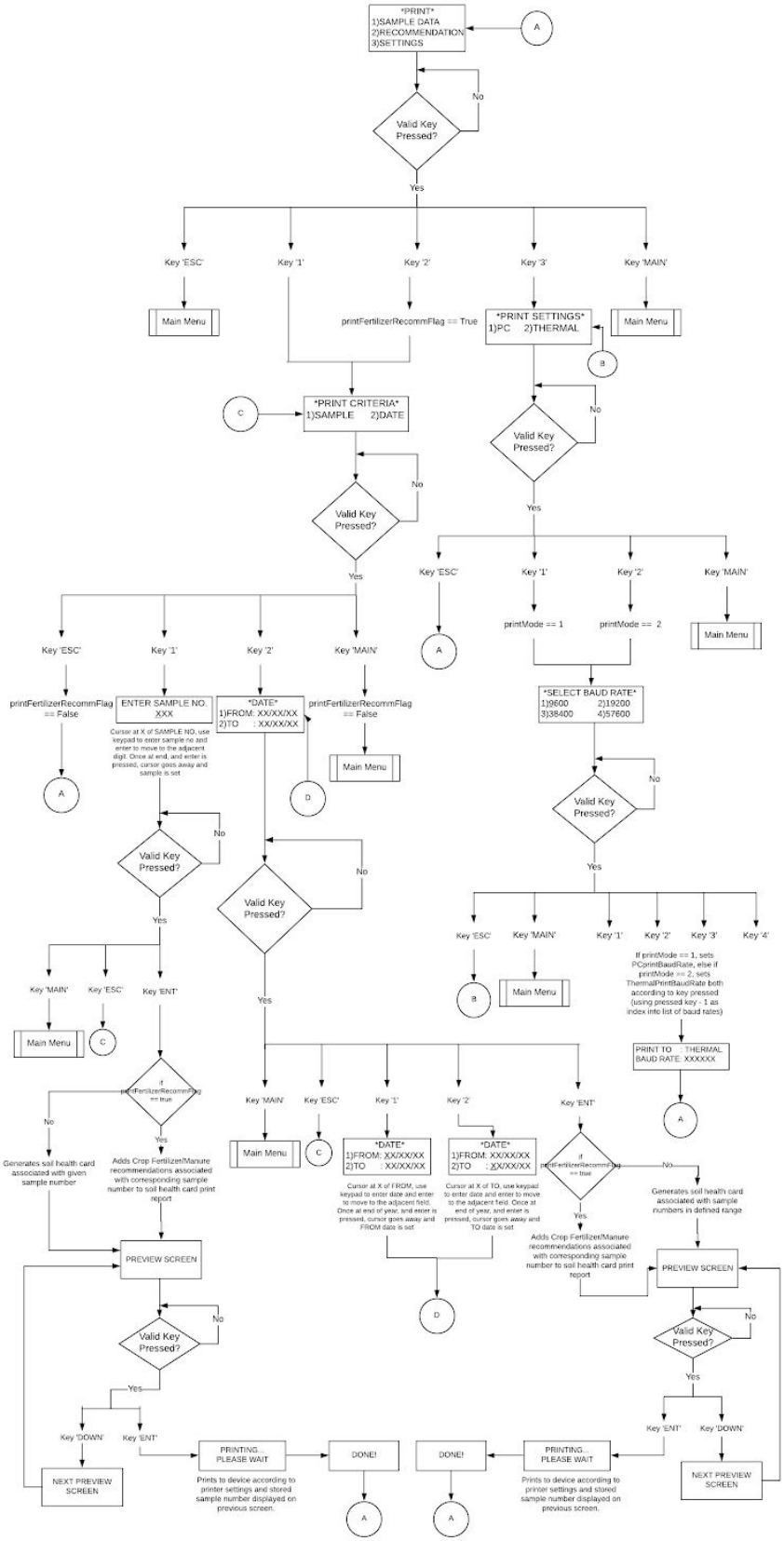
RECOMMENDATION FLOWCHART



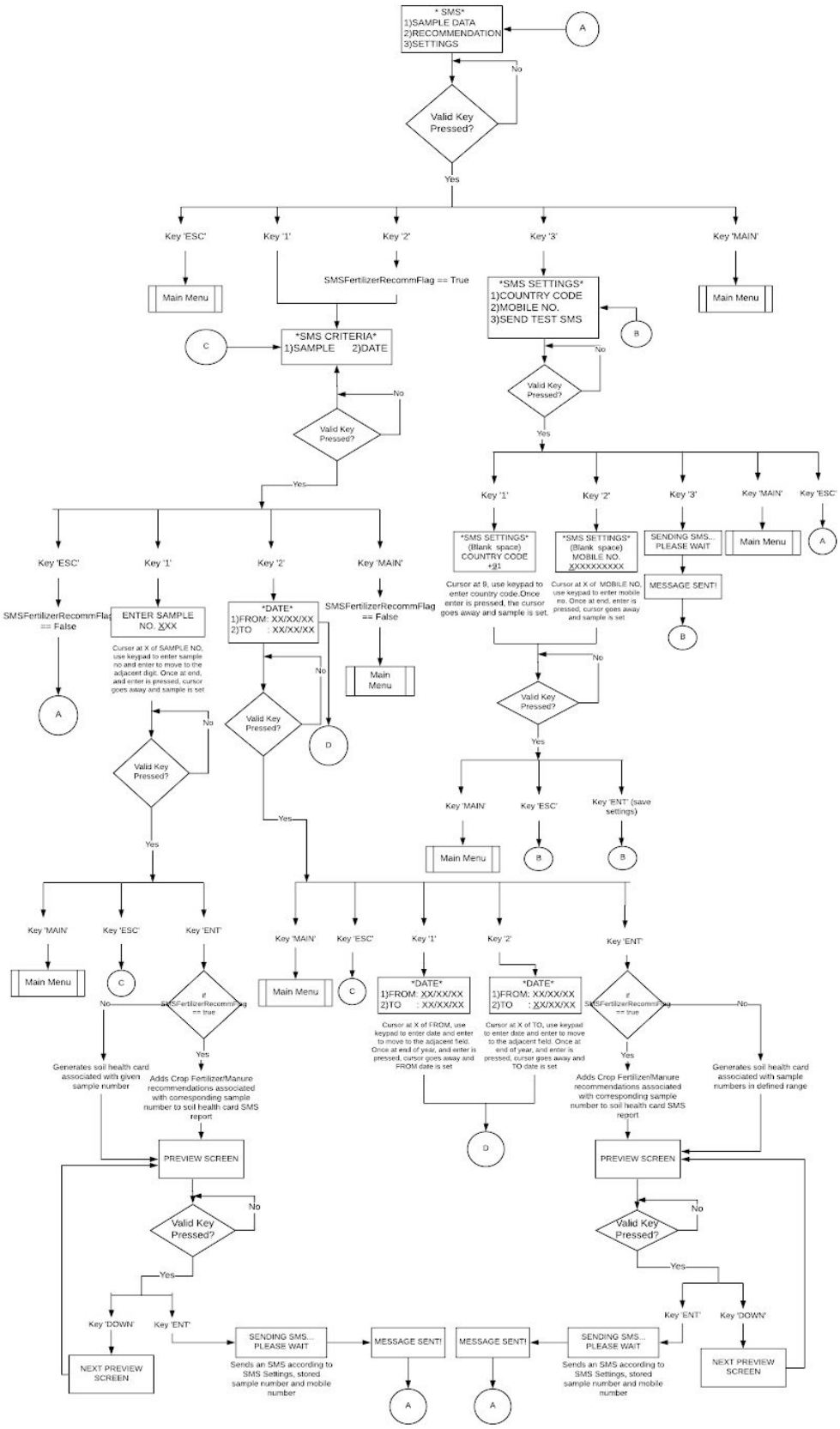
CROP SELECTION MENU



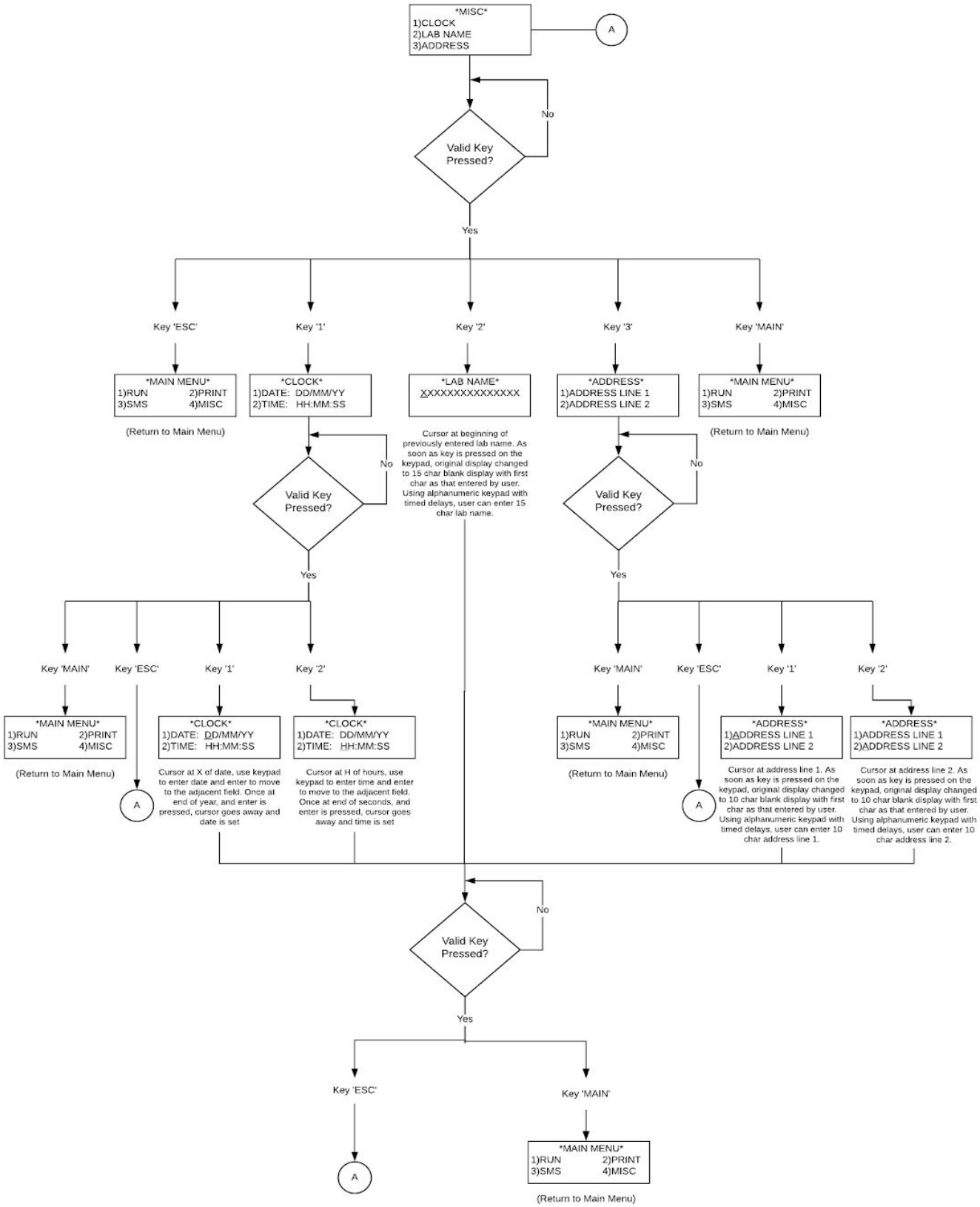
PRINT MENU FLOWCHART



SMS MENU FLOWCHART

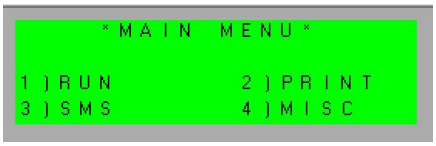


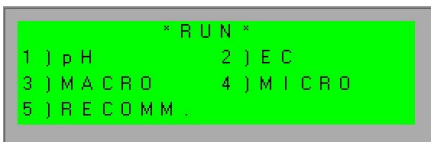
MISCELLANEOUS MENU FLOWCHART

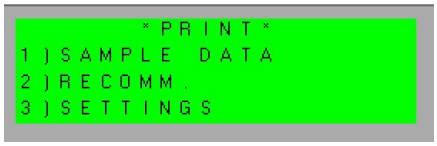


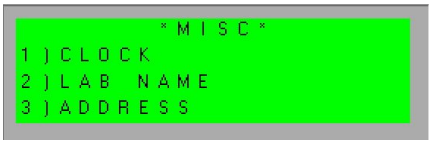
DISPLAYS

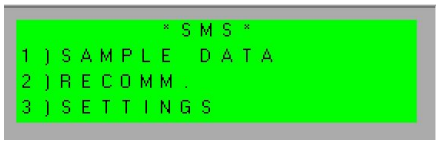
MAIN/COMMON:

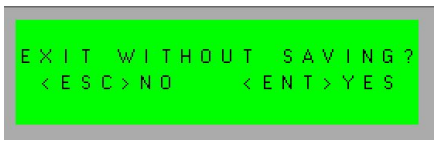


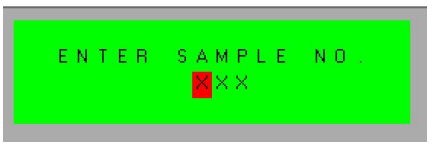


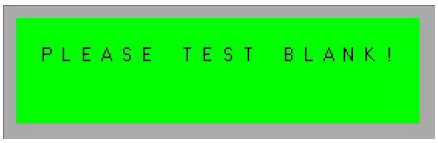




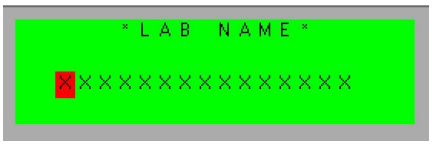


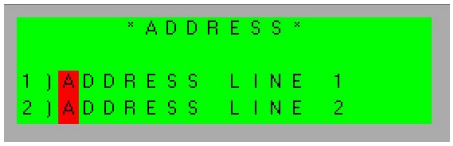


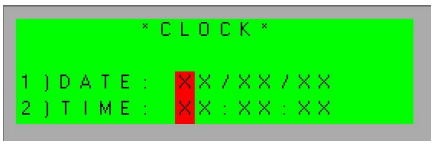




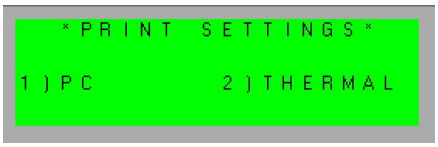
MISC:

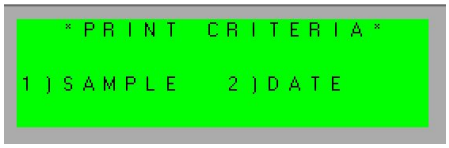


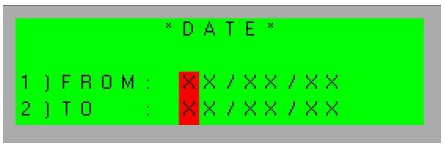


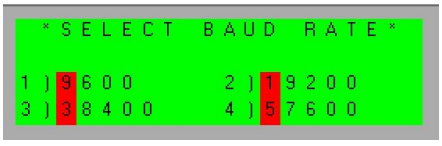


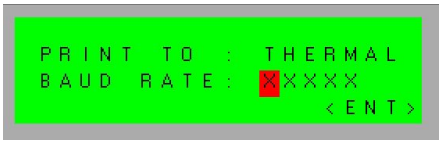
PRINT:

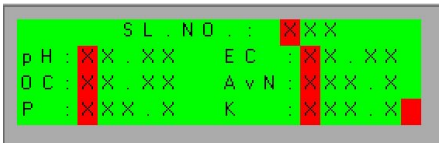


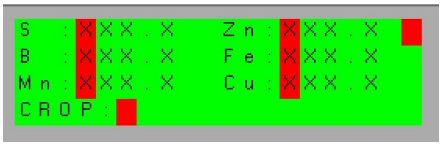




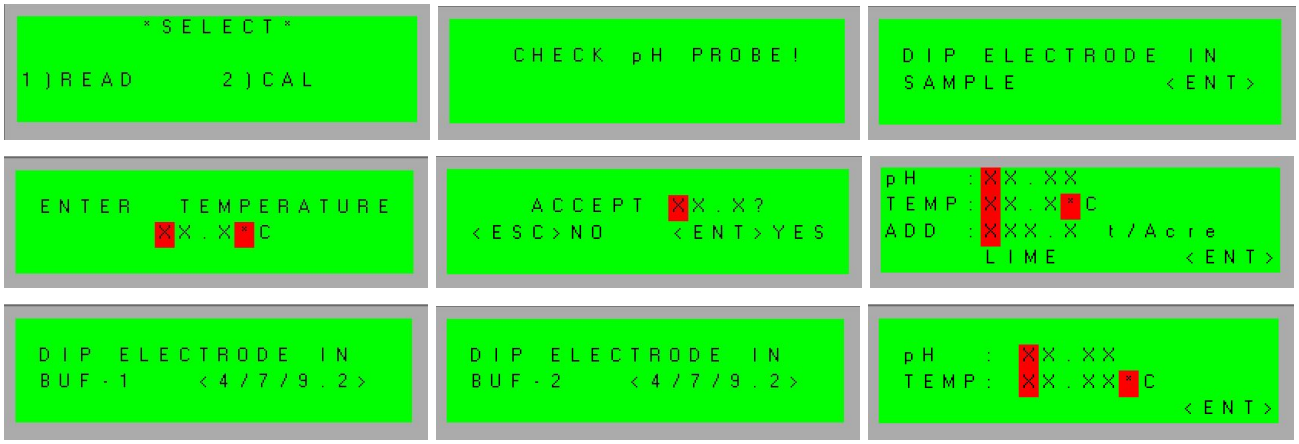




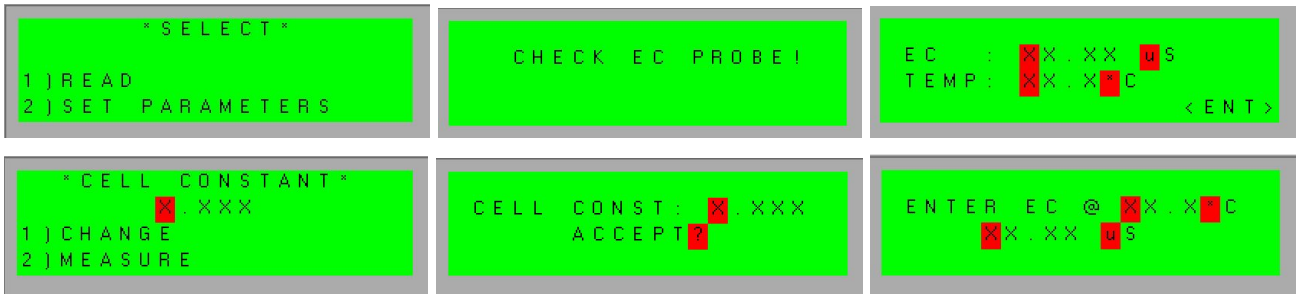




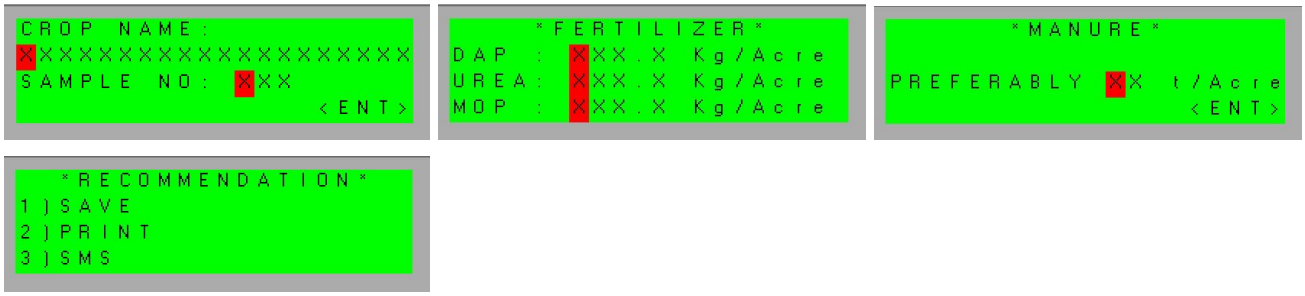
pH:



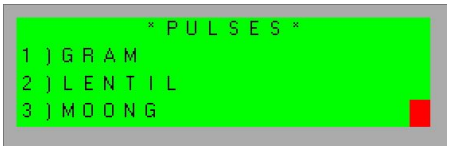
EC:

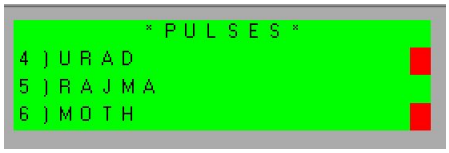


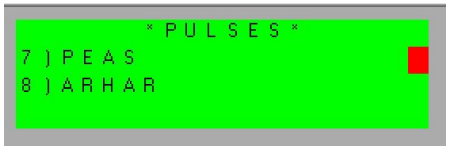
RECOMMENDATION:

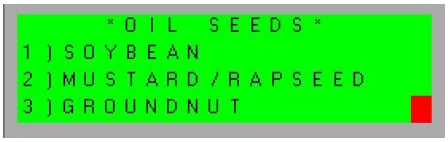


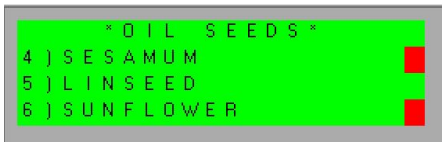
CROPS:


PULSES
1)GRAM
2)LENTIL
3)MOONG

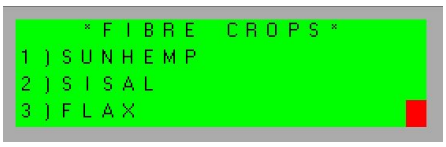

PULSES
4)URAD
5)RAJMA
6)MOTH

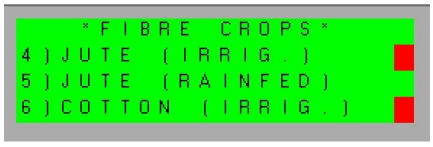

PULSES
7)PEAS
8)ARHAR

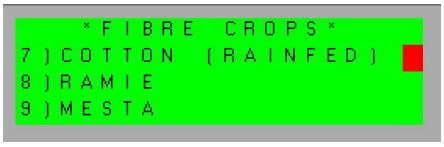

OIL SEEDS
1)SOYBEAN
2)MUSTARD/RAPSEED
3)GROUNDNUT

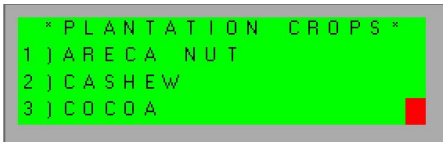

OIL SEEDS
4)SESAMUM
5)LINSEED
6)SUNFLOWER

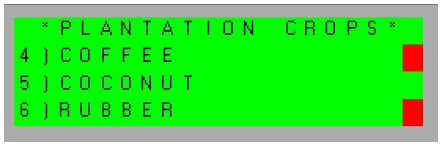

OIL SEEDS
7)SAFFLOWER
8)CASTOR
9)NIGER

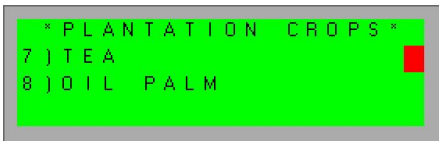

FIBRE CROPS
1)SUNHEMP
2)SISAL
3)FLAX

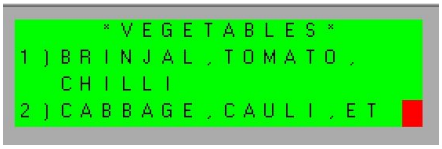

FIBRE CROPS
4)JUTE (IRRIG.)
5)JUTE (RAINFED)
6)COTTON (IRRIG.)

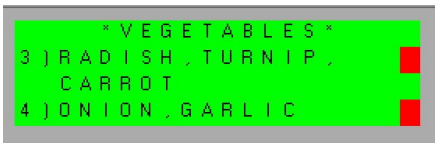

FIBRE CROPS
7)COTTON (RAINFED)
8)RAMIE
9)MESTA

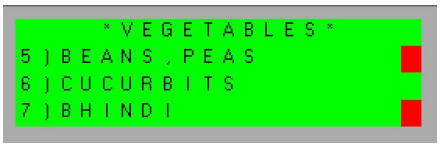

PLANTATION CROPS
1)ARECA NUT
2)CASHEW
3)COCOA

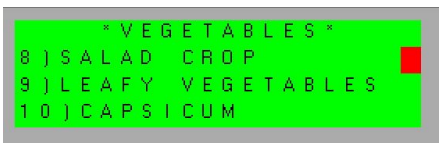

PLANTATION CROPS
4)COFFEE
5)COCONUT
6)RUBBER

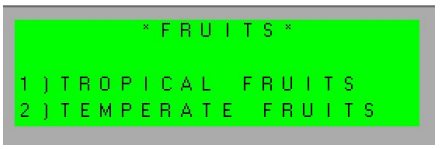

PLANTATION CROPS
7)TEA
8)OIL PALM

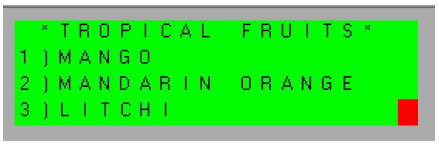

VEGETABLES
1)BRINJAL,TOMATO,
CHILLI
2)CABBAGE,CAULI,ET

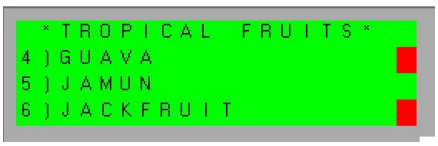

VEGETABLES
3)RADISH,TURNIP,
CARROT
4)ONION,GARLIC

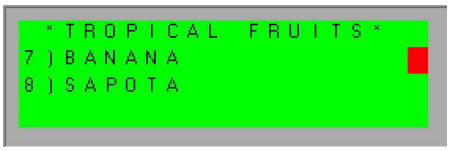

VEGETABLES
5)BEANS,PEAS
6)CUCURBITS
7)BHINDI

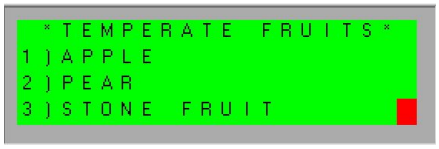

VEGETABLES
8)SALAD CROP
9)LEAFY VEGETABLES
10)CAPSICUM

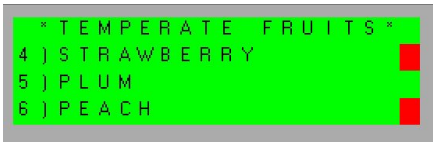

FRUITS
1)TROPICAL FRUITS
2)TEMPERATE FRUITS

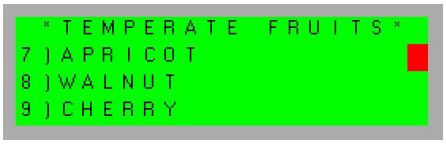

TROPICAL FRUITS
1)MANGO
2)MANDARIN ORANGE
3)LITCHI

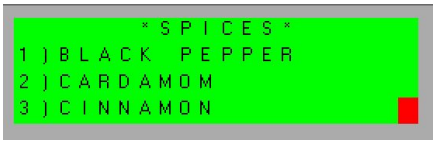

TROPICAL FRUITS
4)GUAVA
5)JAMUN
6)JACKFRUIT

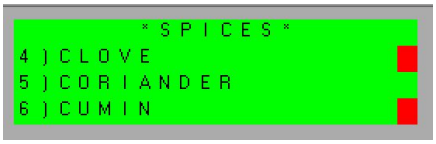

TROPICAL FRUITS
7)BANANA
8)SAPOTA


TEMPERATE FRUITS
1)APPLE
2)PEAR
3)STONE FRUIT


TEMPERATE FRUITS
4)STRAWBERRY
5)PLUM
6)PEACH

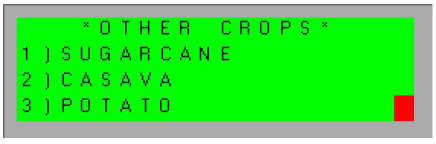

TEMPERATE FRUITS
7)APRICOT
8)WALNUT
9)CHERRY


SPICES
1)BLACK PEPPER
2)CARDAMOM
3)CINNAMON

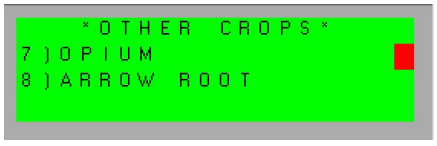

SPICES
4)CLOVE
5)CORIANDER
6)CUMIN


SPICES
7)FENNEL
8)FENUGREEK
9)GINGER


SPICES
10)TURMERIC


OTHER CROPS
1)SUGARCANE
2)CASAVA
3)POTATO

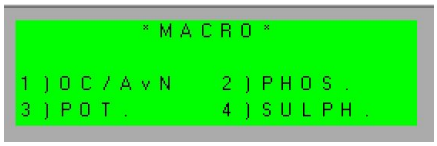

OTHER CROPS
4)SWEET POTATO
5)COLOCASIA
6)YAMS

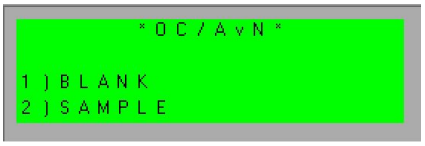

OTHER CROPS
7)OPIUM
8)ARROW ROOT

MICRO:

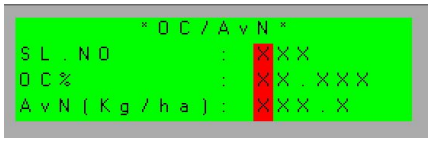

MICRO
1)ZINC 2)BORON
3)IRON 4)MANG
5)COPPER
ZINC
1)BLANK
2)SAMPLE
BORON
1)BLANK
2)SAMPLE
IRON
1)BLANK
2)SAMPLE
MANG
1)BLANK
2)SAMPLE
COPPER
1)BLANK
2)SAMPLE
INSERT BLANK SOL. IN TEST TUBE HOLDER
<ENT>
INSERT SAMPLE SOL. IN TEST TUBE HOLDER
<ENT>
ZINC
BLANK: X.XX
<ENT>
BORON
BLANK: X.XX
<ENT>
IRON
BLANK: X.XX
<ENT>
MANGANESE
BLANK: X.XX
<ENT>
COPPER
BLANK: X.XX
<ENT>
ZINC
SL.NO: XXX
HCL -Zn(mg/Kg): X.XX
DTPA-Zn(mg/Kg): X.XX
BORON
SL.NO:XXX
BORON(mg/Kg):X.XXX
IRON
SL.NO: XXX
HCL -Fe(mg/Kg): X.XX
DTPA-Fe(mg/Kg): X.XX
MANGANESE
SL.NO: XXX
MANG(mg/Kg): X.XXX
COPPER
SL.NO: XXX
HCL -Cu(mg/Kg): X.XX
DTPA-Cu(mg/Kg): X.XX
ZINC
SL.NO: XXX
SUFFICIENT <ENT>
BORON
SL.NO: XXX
SUFFICIENT <ENT>
IRON
SL.NO: XXX
SUFFICIENT <ENT>
MANAGNESE
SL.NO: XXX
SUFFICIENT <ENT>
COPPER
SL.NO: XXX
SUFFICIENT <ENT>
ZINC
SL.NO: XXX
ADD XX Kg/Acre
ZINC SULPHATE
BORON
SL.NO: XXX
ADD XX Kg/Acre
BORAX
IRON
SL.NO: XXX
ADD XX Kg/Acre
IRON SULPHATE
MANGANESE
SL.NO: XXX
ADD XX Kg/Acre
MANGAN SULPHATE
COPPER
SL.NO: XXX
ADD XX Kg/Acre
COPPER SULPHATE

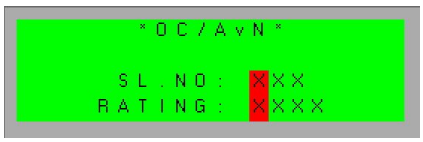
MACRO:

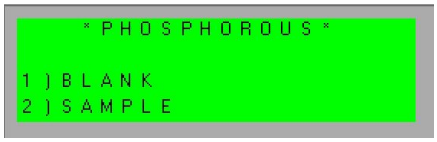

MACRO
1]OC/AvN 2]PHOS.
3]POT. 4]SULPH.


OC/AvN
1]BLANK
2]SAMPLE

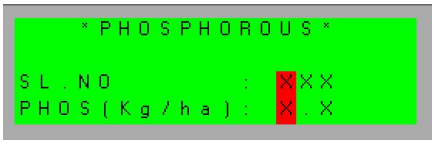

OC/AvN
BLANK: X.XX
<ENT>

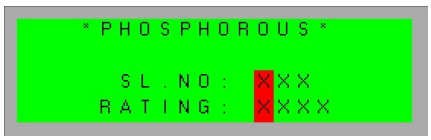

OC/AvN
SL.NO : XXX
OC% : XX.XXX
AvN(Kg/ha): XXX.X

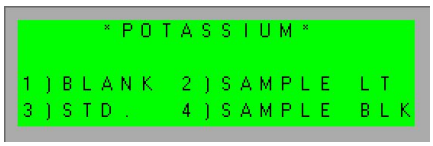

OC/AvN
SL.NO: XXX
RATING: XXXX

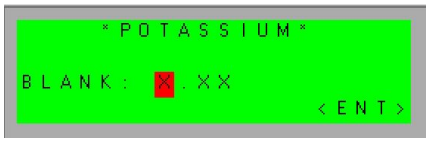

PHOSPHOROUS
1]BLANK
2]SAMPLE

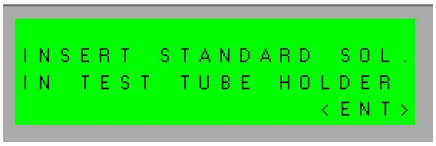

PHOSPHOROUS
BLANK: X.XX
<ENT>

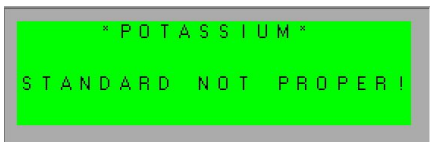

PHOSPHOROUS
SL.NO : XXX
PHOS(Kg/ha): X.X

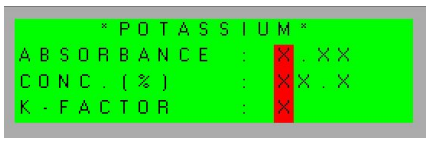

PHOSPHOROUS
SL.NO: XXX
RATING: XXXX

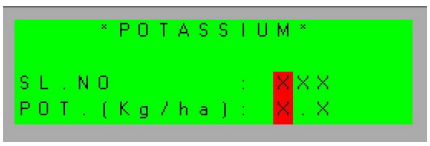

POTASSIUM
1]BLANK 2]SAMPLE LT
3]STD. 4]SAMPLE BLK

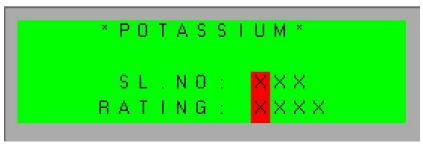

POTASSIUM
BLANK: X.XX
<ENT>

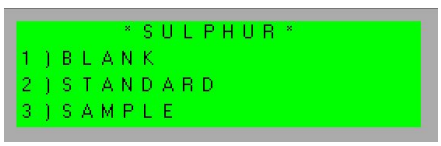

INSERT STANDARD SOL.
IN TEST TUBE HOLDER
<ENT>

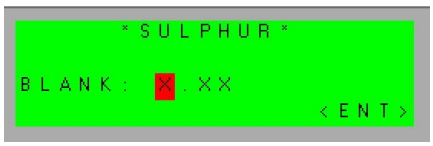

POTASSIUM
STANDARD NOT PROPER!

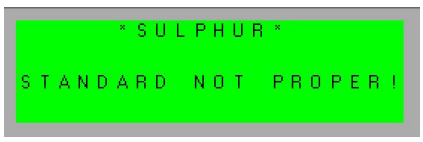

POTASSIUM
ABSORBANCE : X.XX
CONC.(%) : XX.X
K-FACTOR : X

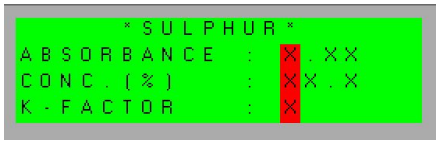

POTASSIUM
SL.NO : XXX
POT.(Kg/ha): XX.X

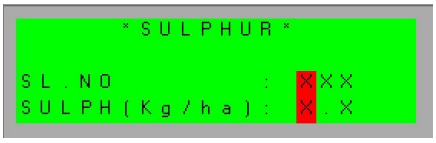

POTASSIUM
SL.NO: XXX
RATING: XXXX

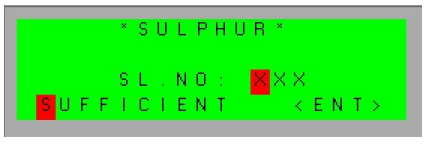

SULPHUR
1]BLANK
2]STANDARD
3]SAMPLE

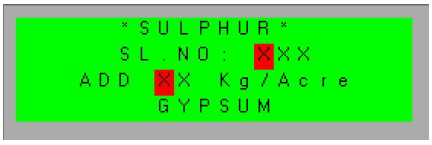

SULPHUR
BLANK: X.XX
<ENT>


SULPHUR
STANDARD NOT PROPER!

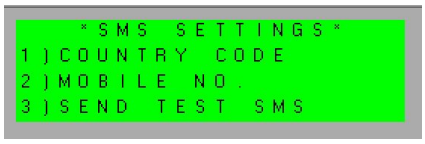

SULPHUR
ABSORBANCE : X.XX
CONC.(%) : XX.X
K-FACTOR : X

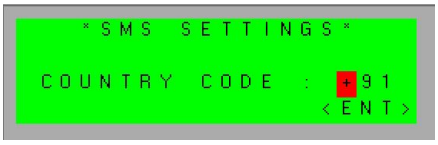

SULPHUR
SL.NO : XXX
SULPH(Kg/ha): XX.X


SULPHUR
SL.NO: XXX
SUFFICIENT <ENT>

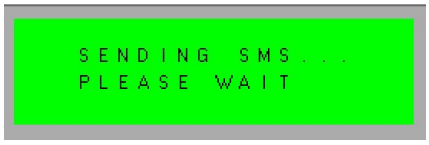

SULPHUR
SL.NO: XXX
ADD XX Kg/Acre
GYPSUM

SMS:


SMS SETTINGS
1]COUNTRY CODE
2]MOBILE NO.
3]SEND TEST SMS


SMS SETTINGS
COUNTRY CODE : +91
<ENT>


SMS SETTINGS
MOBILE NO.
XXXXXXXXX
<ENT>


SENDING SMS...
PLEASE WAIT


MESSAGE SENT!

PC PRINT REPORT

SOIL HEALTH CARD by PUSA STFR METER
Lab Name
Address Line 1
Address Line 2

Name of Farmer	:	Aadhar No.	:
Soil Health Card No.	:	Validity	:
		Mobile No.	:
Address			
Village	:	District	:
Sub-District	:	PIN Code	:

SOIL SAMPLE DETAILS

Date of Testing	:	Khasra No./Drag No.	:
Survey No.	:	Farm Size	:
Latitude	:	Longitude	:

Parameter	Value	Rating	Recommendation
pH	03.90	Slightly Acidic	Add 003.7 t/acre Lime
EC(mS/cm)	00.00	Non-Saline	
OC(%)	00.00	Low	
AvN(kg/ha)	000.0	Low	
Phos(kg/ha)	000.0	Low	
Pot(kg/ha)	000.0	Low	
Sulph(mg/ha)	000.0	Deffic.	Add 120 kg/acre Gypsum
Zinc(mg/kg)	000.0	Deffic.	Add 10 kg/acre ZincSulphate
Boron(mg/kg)	000.0	Deffic.	Add 4 kg/acre Borax
Iron(mg/kg)	000.0	Deffic.	Add 40 kg/acre IronSulphate
Mangan(mg/kg)	000.0	Deffic.	Add 50 kg/acre MangSulphate
Copper(mg/kg)	000.0	Deffic.	Add 4 kg/acre CopperSulph

FERTILIZER/MANURE RECOMMENDATION

Crop	:	Wheat
Manure	:	Preferably 4 t/acre
Fertilizer	:	DAP(065.2 kg/acre), Urea(120.2 kg/acre), MOP(033.3 kg/acre)

Reviewed By	:	
Date	:	
Signature	:	

THERMAL PRINT REPORT

SOIL HEALTH CARD BY
PUSA STFR METER

Lab Name:
Address Line 1
Address Line 2

Date of Testing: XX/XX/XX

SL. No. 0001

pH : 03.98
(Slightly Acidic)
Add 003.7 t/acre Lime

EC(mS/cm) : 00.00
(Non-saline)

OC(%) : 00.00
(Low)

AvN(kg/ha) : 000.0
(Low)

Phos(kg/ha) : 000.0
(Low)

Pot(kg/ha) : 000.0
(Low)

Sulph(mg/ha) : 000.0
(deficient)
Add 120 kg/acre Gypsum

Zinc(mg/kg) : 000.0
(deficient)
Add 10 kg/acre Zinc Sulphate

Boron(mg/kg) : 000.0
(deficient)
Add 4 kg/acre Borax

Iron(mg/kg) : 000.0
(deficient)
Add 40 kg/acre Iron Sulphate

Mangan(mg/kg) : 000.0
(deficient)
Add 50 kg/acre Mangan Sulphate

Copper(mg/kg) : 000.0
(deficient)
Add 4 kg/acre Copper Sulphate

Crop : Wheat
Manure(t/acre): 4
Fert.(kg/acre): DAP(065.2)
Urea(120.2)
MOP(033.3)

SMS PRINT REPORT