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Agricultural Electronics 1-800-SENSOR-1



SET-UP & OPERATION MANUAL 1-16 ROW POPULATION MONITOR

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WARRANTY & RETURN POLICY

SENSOR-1 IS THE WARRANTOR WHO OFFERS A LIMITED 1 YEAR WARRANTY AS OF JANUARY 1, 2014. OUR WARRANTY COVERS PRODUCTS MANUFACTURED BY RVC MANUFACTURING COMPANY.

SENSOR-1 IS LOCATED AT 202 MAIN STREET, PRINCETON, KS 66078.

THE DURATION OF THE WARRANTY FOR SENSOR-1 MANUFACTURED EQUIPMENT AND PRODUCTS (EXCLUDING PLANTER/DRILL MONITORS) IS FOR **ONE** YEAR FROM THE DATE OF INVOICE.

THE WARRANTOR WARRANTS TO THE BUYER THAT THE PRODUCT(S) SOLD HEREUNDER ARE FREE FROM DEFECTS TO MATERIAL AND WORKMANSHIP, UNDER NORMAL USE AND SERVICE, IN THE HANDS OF THE ORIGINAL BUYER.

THE FORGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY FITNESS FOR PURPOSE AND OF ANY OTHER TYPE, WHETHER EXPRESSED OR IMPLIED.

SENSOR-1 OFFERS A FULL REFUND OR REPLACEMENT FOR MERCHANDISE RETURNED UNUSED, IN RESALABLE CONDITION. ALL MERCHANDISE MUST BE RETURNED IN ITS ORIGINAL PACKAGING WITHIN 30 DAYS OF THE ORIGINAL INVOICE DATE. ALL RETURNED ITEMS MUST BE ACCOMPANIED BY A RETURN MERCHANDISE AUTHORIZATION NUMBER (RMA#).

YOU MAY OBTAIN A RMA# BY CALLING A SENSOR-1 SERVICE REPRESENTATIVE AT 1-800-736-7671.

TO SEE FULL WARRANTY & RETURN POLICY, VISIT OUR WEBSITE AT WWW.SENSOR-1.COM

GETTING STARTED

POPULATION MONITOR OVERVIEW:

THE PMPOP16 SERIES S198P POPULATION MONITOR WAS DESIGNED TO TAKE THE “GUESS WORK” OUT OF YOUR PLANTING OPERATION. THIS CONSOLE WILL MONITOR EACH ROW FOR SEED FLOW AND SEED POPULATION DENSITY (SEEDS PER ACRE/SEEDS PER HECTARE). WHEN ANY ROW STOPS PLANTING OR THE SEED POPULATION GOES BELOW/ABOVE THE PRESET VALUE/CONTROL LIMIT, THE CONSOLE WILL SOUND AN ALARM AND VISUALLY INDICATE THE FAILED ROW WITH A FLASHING LIGHT.

THIS MONITOR ALSO PROVIDES THE USER WITH INFORMATION ON POPULATION, ACREAGE/HECTARES PLANTED, AND GROUND SPEED. THE POPULATION MONITOR CONSISTS OF THE FOLLOWING:

- A PLANTER MONITOR CONSOLE
- A CONSOLE CABLE THAT CONNECTS THE MONITOR TO THE PLANTER HARNESS
- POWER CABLE WITH BATTERY LEADS
- RADAR/GPS LEAD

IT IS STRONGLY SUGGESTED, BUT NOT REQUIRED TO HAVE A DISTANCE SENSOR WITH THE POPULATION MONITOR. A DISTANCE SENSOR CONSISTS OF RADAR, UNIVERSAL DISTANCE SENSOR, PRESS WHEEL, OR MANUAL SPEED SETTINGS. THE SEED SENSOR SHOULD BE A POPULATION DEVICE THAT IS INSTALLED IN EACH PLANTER/DRILL ROW, NORMALLY AT THE LOWER END OF THE SEED DELIVERY TUBE. THESE SENSORS ARE LOCATED CLOSE TO THE LOWER END OF THE PLANTER RUNNERS TO QUICKLY DETECT SEED FLOW STOPPAGE. THE SERIES S198P MONITOR POPULATION OR SEED FLOW CAN BE USED ON PLANTERS OR DRILLS, MONITORING 1 TO 16 ROWS.

SINCE EACH PLANTER OR DRILL RUNNER DIFFERS WITH EACH PLANTER MODEL, SEED SENSORS ARE DESIGNED TO FIT SPECIFIC PLANTER TYPES. THIS PROVIDES OPTIMUM SEED SENSING FOR EACH PLANTER MODEL.

INSTALLATION OF CONSOLE:

THE CONSOLE SHOULD BE MOUNTED FOR EASY VIEW AND ACCESS, BUT SHOULD NOT OBSTRUCT THE OPERATOR'S NORMAL VIEW. FOR TRACTORS WITHOUT CABS, THE CONSOLE CAN BE MOUNTED ON THE HOOD. FOR TRACTORS WITH CABS, THE CONSOLE CAN BE MOUNTED INSIDE THE CAB ON THE CAB FRAME. THE MOUNTING BRACKET CAN BE INSTALLED EITHER UPRIGHT OR UPSIDE DOWN TO SUSPEND THE MONITOR FROM THE ROOF OF THE CAB. THE BRACKET CAN BE SECURED WITH TWO BOLTS FOR A FIXED HORIZONTAL ANGLE, OR WITH ONE CENTER BOLT FOR A VARIABLE HORIZONTAL ANGLE.

POWER CABLE:

SENSOR-1 MONITORS OPERATE ON 12-VOLTS DC ONLY. THE CONSOLE'S BATTERY LEAD HAS TWO WIRES. EACH WIRE HAS A RING TERMINAL. THE **RED** WIRE MUST BE CONNECTED TO THE **POSITIVE** SIDE OF THE TRACTOR'S BATTERY REGARDLESS OF WHETHER THE TRACTOR IS POSITIVE OR NEGATIVE GROUND.

THE **BLACK** WIRE MUST BE CONNECTED TO THE **NEGATIVE** SIDE OF THE BATTERY. IF THE TRACTOR USES TWO 12-VOLT BATTERIES CONNECTED IN SERIES, CONNECT THE CONSOLE'S BATTERY LEADS ACROSS THE BATTERY CONNECTED TO THE TRACTOR'S CHASSIS. DO NOT CONNECT THE CONSOLE ACROSS BOTH BATTERIES (2 x 12-VOLTS = 24V). IF THE TRACTOR USES TWO 6V BATTERIES, MAKE SURE THEY ARE CONNECTED IN SERIES.

- IF THE POSITIVE BATTERY TERMINAL ON ONE BATTERY IS CONNECTED TO THE NEGATIVE TERMINAL ON THE OTHER BATTERY, THE BATTERIES ARE CONNECTED IN SERIES.
- IF THE POSITIVE BATTERY TERMINAL ON ONE BATTERY IS CONNECTED TO THE POSITIVE BATTERY TERMINAL OF THE OTHER BATTERY, BATTERIES ARE CONNECTED TOGETHER IN PARALLEL.

IF YOU HAVE A 6V SYSTEM AND THE CONSOLE WILL NOT WORK. SEE BELOW:

- IF THE TWO 6V BATTERIES ARE CONNECTED IN SERIES (BLACK-NEGATIVE/BLACK-POSITIVE), CONNECT THE CONSOLE POWER LEADS ACROSS BOTH BATTERIES.
- IF THE TWO 6V BATTERIES ARE CONNECTED IN PARALLEL (BLACK-NEGATIVE/BLACK-NEGATIVE), THIS WILL NOT CAUSE DAMAGE, BUT THE VOLTAGE WILL BE TOO LOW TO POWER THE CONSOLE. YOU NEED A SEPARATE 12V SOURCE TO USE THE CONSOLE ON A 6V SYSTEM.

NOTE: THE BATTERY, IGNITION, AND ELECTRICAL SYSTEM OF THE TRACTOR MUST BE IN GOOD WORKING ORDER. IF YOUR TRACTOR BATTERY ARRANGEMENT IS DIFFERENT THAN THOSE SHOWN ABOVE, OR IF THERE IS ANY QUESTIONS AS TO WHERE TO CONNECT THE BATTERY CABLE, USE A VOLTMETER TO MAKE SURE YOU HAVE 11-VOLTS TO 14-VOLTS ACROSS THE RED AND BLACK LEADS. ON TRACTORS USING TWO 12-VOLT BATTERIES, MAKE SURE THE CONSOLE BATTERY LEADS ARE CONNECTED DIRECTLY TO THE GROUNDED BATTERY.

MONITOR CABLE:

THE SIGNAL CABLE FROM THE CONSOLE IS TERMINATED WITH A 37- PIN CONNECTOR AT THE PLANTER END. ROUTE THIS CABLE TO THE REAR OF THE TRACTOR, NEAR THE HITCH. BE SURE TO PLACE THE CABLE WHERE IT WILL NOT GET PINCHED, CUT, STEPPED ON, OR DAMAGED IN ANYWAY. ALSO, CHOOSE A ROUTE AWAY FROM THE TRACTOR'S ALTERNATOR AND SPARK PLUGS. MAKE SURE THE PLANTER CAN BE UNHITCHED WITHOUT REMOVING ANY TIE WRAPS. ONCE THE ROUTE IS CHOSEN, LAY THE CABLE IN PLACE AND TIE IT DOWN WITH PLASTIC WIRE TIES.

THE SENSOR-1 MONITOR SIGNAL CABLE MEY BE SET UP FOR A DICKEY-JOHN, CASE-IH, OR A SENSOR-1 HARNESS CONFIGURATION.

- POWER IS ON #24 (ROWS 1-8) & #25 (ROWS 9-16).
- GROUND IS ON #26 (ROWS 1-8) & #27 (ROWS 9-16).
- FOR JOHN DEERE MONITORS, HARNESS POWER IS ON #27 AND GROUND IS ON #28.

BE SURE TO KNOW WHAT TYPE OF HARNESS CONFIGURATION YOU HAVE.

PLANTER OR DRILL HARNESSES:

PLANTER/DRILL HARNESS INSTALLATION IS NOT DIFFICULT. HOWEVER, YOU MUST BE CAREFUL TO LOCATE THE HARNESS WHERE IT WILL NOT GET PINCHED, CUT, STEPPED ON, OR DAMAGED BY MOVING PARTS DURING OPERATION OR TRANSPORTING OF YOUR PLANTER /DRILL.

START BY CONNECTING THE TONGUE OF THE HARNESS CABLE TO THE CONSOLE'S SIGNAL CABLE. TIE THE TONGUE OF THE HARNESS CABLE TO THE PLANTER'S HITCH (BE SURE TO LEAVE ENOUGH SLACK TO ALLOW TURNING WITHOUT STRETCHING OR BREAKING THE CABLES). TIE THE OTHER END OF THE TONGUE CABLE TO THE OTHER END OF THE HITCH BOOM AT THE POINT IT CONNECTS TO THE PLANTER'S TOOL BAR. TIE DOWN THE REST OF THE TONGUE CABLE TO THE HITCH BOOM. COIL UP ANY EXCESS AND TIE IT UP TO PREVENT DAMAGE DURING OPERATION. FAN THE HARNESS CABLE ALONG THE PLANTER'S TOOL BAR SO ROW ONE IS ON THE FAR LEFT, WHEN FACING THE DIRECTION OF FORWARD TRAVEL. MAKE SURE THE CABLES ARE IN ORDER ACROSS THE TOOL BAR. CHECK TO MAKE SURE THE CABLES WILL NOT BE DAMAGED DURING OPERATION. TIE ALL THE CABLES DOWN WITH PLASTIC WIRE TIES.

SENSOR INSTALLATION:

THE SENSORS ARE MOUNTED ON EACH PLANTER SHANK NEAR THE BOTTOM OF THE SEED DELIVERY TUBES. ROUTE EACH SENSOR CABLE TO THE HARNESS AND TIE IT DOWN TO PREVENT DAMAGE TO THE SENSOR CABLE DURING OPERATION.

PLANTER/DRILL MONITOR OPERATION:

- AFTER CONNECTING THE 12V BATTERIES, TURN THE CONSOLE ON BY FLIPPING THE ON/OFF SWITCH.
- ALL ROW INDICATOR LIGHTS WILL BE TURNED ON
- THE ALARM WILL SOUND AND A NUMBER WILL APPEAR SUCH AS 1.3 OR 1.4. THIS NUMBER IS THE PROGRAM VERSION FOR THAT MONITOR.
- YOUR SERIAL NUMBER WILL APPEAR NEXT.
- IF IN MODE 1, ALL INDICATOR LIGHTS SHOULD BE FLASHING AT APPROXIMATELY THE SAME RATE.
- IF ONE OF THE LIGHTS IS FLASHING AT A SLOWER RATE, CHECK FOR PROPER SEED POPULATION.
- TO CHECK THE POPULATION, PRESS THE ROW KEY UNTIL THE ROW IS SELECTED.
- AN ALARM SOUND OCCURS WHEN THE POPULATION DENSITY IS OUTSIDE OF THE SET LIMITS. (NO SEEDS ARE GOING DOWN THE TUBE, OR IN CASE OF SEED BLOCKAGE).
- THE INDICATOR LIGHT WILL COME ON WITH HIGH INTENSITY IF THERE IS AN ALARM CONDITION.
- IF ALL ROWS ARE NOT PLANTING, THE ALARMS WILL SOUND FOR A FEW SECONDS AND ALL OF THE LIGHT INDICATORS WILL REMAIN FLASHING UNTIL NORMAL PLANTING OCCURS.
- PRESSING THE ENTER KEY CAN CLEAR THE BUZZER. THE BUZZER WILL REMAIN ON UNTIL A NEW ALARM CONDITION IS DETECTED.

SCAN:

PUSH THE “SCAN” BUTTON FOR THE MONITOR TO DISPLAY THE POPULATION FOR EACH OF THE ROWS, ONE ROW AT A TIME. (WHEN THE MONITOR IS DISPLAYING A ROW’S POPULATION, IT IS STILL CHECKING THE OTHER ROWS FOR SEED BLOCKAGE)

-IF YOU ARE LOOKING AT ROW 1 AND ROW 4 STOPS PLANTING, THE MONITOR WILL INDICATE THE FAILED ROW WITH A FLASHING LIGHT.

-THE DISPLAY WILL SHOW 39.5 FOR A 39,500 POPULATION.

ROW SELECT:

PUSH THE “ROW SELECT” BUTTON TO STOP SCANNING. THE MONITOR WILL DISPLAY THE POPULATION FOR THE SELECTED ROW UNTIL YOU PRESS ANOTHER FUNCTION.

TO ADVANCE TO THE NEXT ROW, PRESS “ROW SELECT” AGAIN. AFTER PRESSING THIS BUTTON, THE DISPLAY WILL SHOW THE POPULATION FOR THAT ROW.

ACRE/SPEED (HECTARES/SPEED):

THE ACRE/SPEED BUTTON HAS MANY FEATURES TO IT:

- TOTAL ACRES
- FIELD ACRES
- SPEED
- SEED SPACING.

PRESS THE “ACRE/SPEED” BUTTON FOR THE MONITOR TO SHOW THE OPTIONS LISTED ABOVE. THE MONITOR WILL SHOW ONE OF THESE OPTIONS AT A TIME. PRESS THE KEY AGAIN TO SEE THE NEXT OPTION AND CONTINUE UNTIL YOU FIND THE OPTION YOU NEED.

FOR EASY IDENTIFICATION, THE SPEED IS PRESET WITH A DASH. (EXAMPLE: - 4.5 MEANS 4.5 MILES PER HOUR OR KILOMETERS PER HOUR.). THE TOTAL AND FIELD ACRES (HECTARES) ARE AUTOMATICALLY TURNED OFF IF THE PLANTER OR DRILL IS NOT PLANTING. THE DISPLAY WILL STAY ON TOTAL FIELD ACRES (HECTARES) OR SPEED UNTIL YOU PRESS THE ACRE/SPEED BUTTON AGAIN OR THE SCAN OR ROW SELECT BUTTON. THE DISPLAY WILL THEN SHOW FOUR DASHES UNTIL THE MONITOR UPDATES.

NEW FEATURES

(- -) SYMBOLIZES THE SPEED (=) SYMBOLIZES THE SEED SPACING
(≡) SYMBOLISES FIELD ACRES () NO SYMBOL IS TOTAL ACRES

ZERO OUT THE ACRES COUNTER: **NEW FEATURE**

TO ZERO OUT THE FIELD AND TOTAL ACRES COUNTER, PRESS AND HOLD THE ACRES/ SPEED COUNTER BUTTON FOR 5 SECONDS. THE FIELD ACRES WILL ZERO OUT, BUT IF YOU CONTINUE TO HOLD THE ACRES/ SPEED BUTTON, THE TOTAL ACRES WILL ALSO ZERO OUT.

MODE 1 & MODE 2:

WHEN THE MONITOR IS TURNED ON, IT WILL DEFAULT TO MODE 1. IN MODE 1, THE LIGHTS WILL FLASH EVERY TIME A SEED PASSES THROUGH THE TUBE SENSORS. IN MODE 2, THE LIGHTS WILL BE OFF UNTIL THE ROW IS SELECTED OR A FAILURE IS DETECTED.

DISPLAY POPULATION, ACRE (HECTARES), & SPEED:

THE MONITOR WILL DISPLAY POPULATION IN 1000 SEEDS PER ACRE (HECTARES) (EXAMPLE 23.5 IS 23,500 SEEDS). THE MONITOR WILL DISPLAY ACRES (HECTARES) IN 0.1-ACRE (HECTARES) STEPS. THE MONITOR WILL DISPLAY THE SPEED IN MILES PER HOUR (KILOMETER PER HOUR) TO THE NEAREST 0.1 MPH (KPH).

ROW FAILURE:

THE MONITOR CONTINUOUSLY CHECKS FOR SEED FLOW, AS INDICATED BY THE FLASHING ROW INDICATOR LIGHTS ON THE CONSOLE. IF ANY SEED SENSOR IS NOT DETECTING SEEDS, THE ALARM WILL SOUND CONTINUOUSLY AND THE ROW INDICATOR LIGHT CORRESPONDING TO THE PLANTER ROW UNIT WILL FLASH. WHEN THIS HAPPENS, QUIT PLANTING AND CHECK TO SEE WHAT IS WRONG WITH THE PLANTER UNIT.

ALL ROW FAILURE:

WHEN YOU LIFT YOUR PLANTER AT THE END OF THE ROW AND SEED FLOW STOPS IN ALL PLANTER UNITS, THE ALARM WILL SOUND AND ALL ROW INDICATOR LIGHTS WILL STOP FLASHING AND REMAIN ON. AFTER APPROXIMATELY 2 TO 4 SECONDS THE ALARM WILL STOP SOUNDING.

AVERAGE POPULATION: **NEW FEATURE**

AFTER THE MONITOR SCANS THE POPULATION FOR ALL THE ROWS, THE MONITOR WILL DISPLAY THE AVERAGE POPULATION FOR ALL ROWS. THE AVERAGE POPULATION FOR ALL OF THE ROWS WILL FLASH FOR 5 SECONDS, BEFORE IT STARTS SCANNING EACH ROW.

SETUP FUNCTIONS:

THERE ARE 10 CONSTANTS THAT MUST BE ENTERED FOR SETUP. AFTER EACH STEP, YOU MUST PRESS THE "ENTER" KEY IN ORDER TO SAVE AND MOVE ON.

1. THE NUMBER OF SENSORS: NUMBER OF SENSORS INSTALLED ON THE PLANTER OR DRILL.
2. THE TOTAL NUMBER OF ROWS: NUMBER OF DROPS ON YOUR PLANTER OR DRILL. THIS IS IMPORTANT TO DETERMINE THE IMPLEMENT WIDTH (ROW SPACING TIMES THE NUMBER OF ROWS = IMPLEMENT WIDTH.)
3. THE ROW SPACING: IS THE WIDTH OF ONE ROW SPACING IN INCHES (CENTIMETER) AND IS EQUAL TO THE DISTANCE BETWEEN ANY SEED LINE AND THE SEED LINE NEXT OVER.
4. HIGH POPULATION ALARM SETTING: A VALUE THAT ALERTS YOU WHEN THE POPULATION GOES OVER THIS SET VALUE. (10-15%)
5. LOW POPULATION ALARM SETTING: A VALUE THAT ALERTS YOU WHEN THE POPULATION GOES UNDER THIS SET VALUE. (10-15%)
6. POPULATION GAIN: THE OPERATOR CAN INCREASE THE OVERALL POPULATION TO MAKE UP FOR SENSOR ERRORS. (SET AT 0)
7. THE SPEED CONSTANT: MATCHES THE CONSOLE TO THE DISTANCE SENSOR. THE SPEED CONSTANT IS EQUAL TO THE NUMBER OF CLICKS OR DISTANCE PULSES IN 200 FEET (50 METERS). THE SPEED CONSTANT CAN BE CALCULATED BY THE OPERATOR OR MEASURED BY THE MONITOR. THERE ARE THREE TYPES OF DISTANCE SENSORS THAT CAN BE USED WITH THIS MONITOR: RADAR, GPS, UNIVERSAL DISTANCE SENSOR, OR PRESS WHEEL SENSORS. IF THERE'S NO DISTANCE SENSOR BEING USED, THEN SET SPEED OR MILES PER HOUR (KILOMETER) IN AS A CONSTANT 1 THROUGH 20 MILES (KILOMETERS) PER HOUR. WHEN THE VALUE ENTERED FOR THE SPEED CONSTANT IS 200 OR LESS, THE MONITOR WILL ACCEPT IT AS THE SPEED YOU WILL BE OPERATING AT. THE MONITOR DISPLAY WILL CHANGE TO SHOW MPH OR KMH SUCH AS 3.2. YOU MAY SET THE MPH TO A VALUE OF 0.1 MPH TO 20.0 MPH. (KMH)
8. MANUAL SPEED CONSTANT: THE OPERATOR CAN MANUALLY ENTER THE VALUE OR FINE TUNE THE EXISTING VALUE.
9. LIGHT INTENSITY SETTING: LIGHT INTENSITY HAS A RANGE OF 1-10, PRESET TO 10, WHERE 10 IS THE HIGHEST.
10. HOPPER LEVEL SENSORS: THE HOPPER LEVEL SENSOR WILL DISPLAY ONLY IF THE HOPPER SENSOR FAILS. IF THE HOPPER LEVEL SENSOR FAILED, THEN SEED MUST BE ADDED TO THE BIN. IF THE HOPPER SENSORS FAIL THEN HOP WILL SHOW ON THE DISPLAY AND AN ALARM WILL SOUND. PRESS ENTER TO CLEAR THE ALARM. ONCE YOU CLEAR THE ALARM THEN THE HOP WILL NOT APPEAR AGAIN UNTIL YOU RESET THE MONITOR OR REFILL THE HOPPER AND IT BECOMES EMPTY AGAIN.

SET-UP

NOTE:

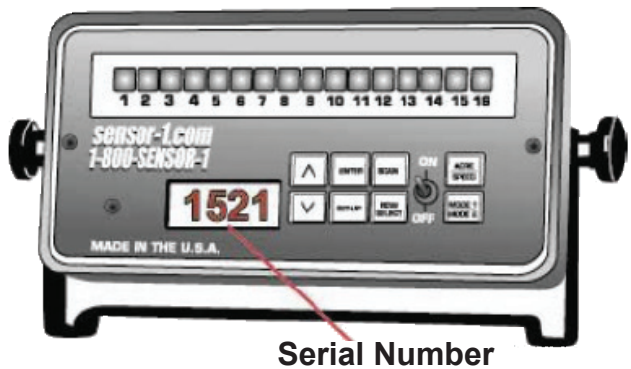
MONITOR DOES NOT NEED TO BE HOOKED UP TO HARNESS IN ORDER TO DO THE SET-UP

WHEN YOU FIRST TURN ON THE MONITOR YOU WILL SEE "1.4".

THIS IS THE PROGRAM VERSION.

NEXT, YOU WILL SEE THE SERIAL NUMBER APPEAR.

TO BEGIN THE SET-UP PROCESS, PRESS THE "SET UP" BUTTON ON THE MONITOR.



STEP ONE

LIGHT #1 IS ON FOR “NUMBER OF SENSORS”



ENTERING THE NUMBER OF SENSORS:

- Row 1 LIGHT SHOULD BE ON (IF NOT, PRESS THE **ENTER** BUTTON UNTIL ONLY ROW 1 LIGHT IS ON.).
- THE DISPLAY WILL READ THE CURRENT NUMBER OF SENSORS FROM MEMORY.
- USE THE **UP** AND **DOWN** ARROW KEYS TO CHANGE THE NUMBER OF SENSORS.
- PRE-SET VALUE IS THE MAXIMUM OF ROWS OF YOUR MONITOR:
4, 6, 8, 12, OR 16 ROWS.
- PRESS THE **ENTER** KEY TO STORE THE VALUE AND ADVANCE TO SETUP STEP 2.

STEP TWO

LIGHT #2 IS ON FOR “NUMBER OF ROWS”

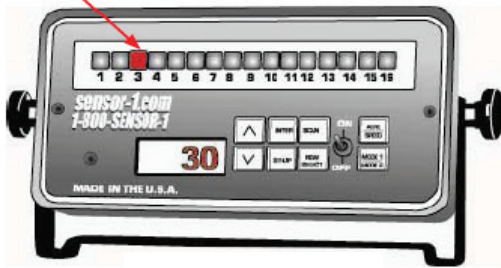


ENTERING THE NUMBER OF ROWS:

- ONLY THE ROW 2 LIGHT WILL BE ON.
- THE DISPLAY WILL READ THE CURRENT NUMBER OF ROWS FROM MEMORY. (MAKE SURE YOU ENTER THE TOTAL NUMBER OF ROWS.)
- USE THE **UP** AND **DOWN** ARROW KEYS TO CHANGE THE NUMBER OF ROWS.
- THE PRE-SET VALUE IS THE NUMBER OF SENSORS INPUTTED.
- PRESS THE **ENTER** KEY TO STORE THE VALUE AND ADVANCE TO SETUP STEP 3.
- NOTE: RESET ACRES (HECTARES) IF YOU CHANGE NUMBER OF ROWS.**

STEP THREE

LIGHT #3 IS ON FOR "ROW SPACING"



ENTERING ROW SPACING:

- ONLY THE ROW 3 LIGHT WILL BE ON.
 - THE DISPLAY WILL READ THE CURRENT ROW SPACING FROM MEMORY.
 - USE **UP** OR **DOWN** ARROW KEYS TO SET ROW SPACING.
- ROW SPACING IS ENTERED IN INCHES. THE PRE-SET WILL BE 30" ROW SPACING (76.2 CENTIMETER).
- RESET ACRES (HECTARES) TO ZERO IF YOU CHANGE THE NUMBER OF ROW SPACING.**
 - PRESS THE **ENTER** KEY TO STORE THE VALUE AND ADVANCE TO THE NEXT STEP.

STEP FOUR

LIGHT #4 IS ON FOR "HIGH POPULATION"

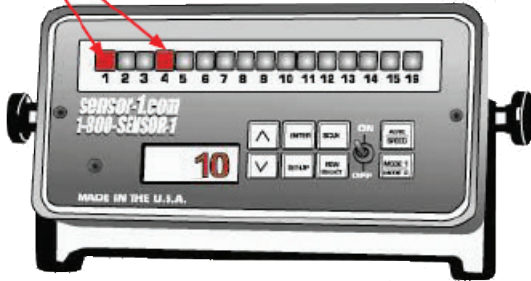


ENTERING HIGH POPULATION LIMIT:

- THE ROW 4 LIGHT WILL BE ON.
- THE DISPLAY WILL READ THE CURRENT HIGH POPULATION LIMIT FROM MEMORY.
- SET THE HIGH POPULATION LIMIT BY USING THE **UP** AND **DOWN** ARROW KEYS. (SEE NOTES: 10-15%)
 - THE DISPLAY WILL READ 1000 SEEDS PER ACRE (HECTARES).
 - EXAMPLE **300** IS **300,000** SEEDS PER ACRE (HECTARES).
 - THE PRE-SET VALUE IS 300.
- PRESS THE **ENTER** KEY TO STORE THE VALUE AND ADVANCE TO STEP 5.

STEP FIVE

LIGHTS #1 & #4 ARE ON FOR “LOW POPULATION”



ENTERING LOW POPULATION LIMIT:

- THE ROW 1 AND 4 LIGHTS WILL BE ON.
- THE DISPLAY WILL READ THE CURRENT LOW POPULATION LIMIT FROM MEMORY.
- SET THE LOW POPULATION LIMIT BY USING THE **UP** AND **DOWN** ARROW KEYS. (SEE NOTES: 10-15%)
- THE DISPLAY WILL READ 1000 SEEDS PER ACRE (ENGLISH).
 - EXAMPLE: 10.0 IS 10,000 SEEDS PER ACRE (HECTARES).
 - THE PRE-SET VALUE IS 10.
- PRESS THE **ENTER** BUTTON TO STORE THE VALUE AND ADVANCE TO SETUP 6.

NOTES:

FOR HIGH AND LOW POPULATION LIMITS IT SHOULD BE SET TO AT LEAST +/- 15% THAN THE DESIRED PLANTING RATE OF THE POPULATION VALUE YOU WANT.

THIS LIMIT IS A VARIABLE DECIDED BY THE USER. IT SHOULD BE KEPT IN MIND THAT SETTING THE VARIABLE TOO CLOSE TO YOUR LIMIT WOULD SOUND THE HI OR LOW WARNING ALARM MORE OFTEN.

DRILLS WILL NEED A HIGHER MARGIN OF ERROR. USE +/- 20% TO +/- 30% DEPENDING ON THE TYPE OF DRILL YOU ARE USING.

THE DRILL WILL DROP MULTIPLE SEEDS AT A TIME INSTEAD OF DROPPING SEEDS CONSTANTLY, LIKE A PLANTER DOES.

-FOR A DRILL, THE POPULATION WILL JUMP UP AND DOWN SLIGHTLY SINCE MORE SEED DROP AT ONE TIME, UNLIKE THE CONSTANT DROPS OF A PLANTER.

IF THE LOW POPULATION IS SET TO ZERO (0), THERE WILL BE NO ALARM SOUNDING FOR LOW, HI POPULATION OR TUBE BLOCKAGE.

IF YOU WANT THE ALARM TO GO OFF, YOU NEED TO SET THE LOW POPULATION TO AT LEAST GREATER THAN 1.0.

STEP SIX

LIGHTS #2 & #4 ARE ON FOR "POPULATION GAIN"



SETTING POPULATION GAIN: NEW FEATURE

- LIGHTS OVER ROWS 2 AND 4 SHOULD BE ON.
- THE ACCURACY OF A PLANTER MONITOR SYSTEM IS DETERMINED BY THE SEED SENSOR AND HOW WELL THAT SENSOR COUNTS THE SEEDS.
- THE METHOD OF SEED DROPPING PLAYS AN IMPORTANT ROLE IN ACCURATE SEED COUNTING.
- A SENSOR MOUNTED ON A PLANTER COUNTS THE SEEDS AS THEY ARE DROPPED ONE SEED AT A TIME.
- THIS DEVICE WILL COUNT MUCH MORE ACCURATELY (CLOSE TO 100%) THAN A SEED SENSOR THAT IS MOUNTED ON A DRILL WITH A FLUTED TYPE OF SEED TUBE THAT DISTRIBUTES SEEDS SEVERAL AT A TIME.

NOTES:

DIFFERENT STYLES OF SEED SENSORS WILL ALSO COUNT DIFFERENTLY.

THE SENSOR-1 MONITOR CAN BE ADJUSTED WITH THE POPULATION GAIN BY SETTING A POPULATION GAIN FACTOR.

AN EXAMPLE WOULD BE A JOHN DEERE® 750 DRILL SETUP TO PLANT SOYBEANS. THESE DRILLS WILL HAVE A TYPICAL ERROR OF 15% TO 20%. THIS MEANS THAT THE SEED SENSOR WILL MISS 13 TO 15 SEEDS FOR EVERY 100 SEEDS PLANTED.

BY PROGRAMMING 20% INTO THE POPULATION GAIN, THE SENSOR-1 MONITOR WILL CALCULATE POPULATION WITH THE ERROR CORRECTION AND DISPLAY A POPULATION VALUE THAT IS MUCH CLOSER TO CORRECT.

TO CHANGE THE POPULATION GAIN NUMBER, SET THE VALUE YOU WANT IN THE FUNCTION NOTE THAT "00%" TO "99%".

-THIS SETTING IS GENERALLY LEFT AT "0".

KEEP IN MIND, 99% WILL ALMOST DOUBLE THE VALUE THAT IS COUNTED BY THE SEED SENSORS. 00% WILL ADD NO CORRECTION.

STEP SEVEN

LIGHTS #3 & #4 ARE ON: MEASURE SPEED CONSTANT 200' SET-UP



MEASURE SPEED CONSTANT:

-THE ROW 3 & 4 LIGHT WILL BE ON WHEN MEASURING THE SPEED CONSTANT.

-PRESS THE **ENTER** BUTTON TO SKIP THIS STEP IF YOU ARE USING A CALCULATED SPEED CONSTANT.

-WHEN MEASURING THE SPEED CONSTANT, TRY TO MATCH ACTUAL FIELD CONDITIONS. IT SHOULD BE SIMULATED AS CLOSE AS POSSIBLE.

1. MEASURE AN ACCURATE 200 FEET (50 METERS) IN FIELD COURSE, PREFERABLY ON A LEVEL GROUND. MARK OFF THE START AND FINISH OF THE COURSE, SO IT WILL BE VISIBLE FROM THE CAB AS YOU DRIVE BY THE MARKERS.
2. PRESS THE **SET-UP** BUTTON. PRESS THE **ENTER** BUTTON UNTIL ONLY THE ROW 3 & 4 LIGHTS ARE ON THE DISPLAY WILL SHOW THE CURRENT SPEED CONSTANT FROM MEMORY.
3. START PLANTING. WHEN PASSING THE FIRST MARKER PUSH THE **UP** ARROW KEY. THE DISPLAY WILL START COUNTING AS YOU MOVE YOUR EQUIPMENT.
4. WHEN YOU'RE PASSING THE FINISH MARKER PRESS THE **DOWN** ARROW KEY. THE DISPLAY WILL STOP COUNTING AND DISPLAY YOUR SPEED CONSTANT.
5. WHEN THE CALIBRATION PROCEDURE IS COMPLETED, THE CONSTANT ESTABLISHED, THE VALUE SHOULD BE WRITTEN DOWN AND RETAINED IN THE EVENT OF A MEMORY LOSS. IF THIS HAPPENS THE CONSTANT MUST BE RE-ENTERED MANUALLY USING THE **SETUP 8**. THE ACCURACY OF THE 200-FOOT (50 METERS) CALIBRATION SHOULD BE AS ACCURATE AS POSSIBLE, AS THIS WILL DETERMINE THE POPULATION COUNT ACCURACY. RECORD THIS NUMBER FOR FUTURE REFERENCES.
6. 6. PRESS THE **ENTER** KEY TO STORE THE SPEED CONSTANT TO MEMORY AND TO ADVANCE TO **SETUP 8**. SPEED CONSTANT REFERENCE _____.
THE MONITOR IS PRE-SET TO 7773 (6375 METRIC) FOR SPEED CONSTANT. IF THE SPEED CONSTANT IS EQUAL TO ZERO, THE MONITOR WILL COUNT SEEDS INSTEAD OF POPULATION. USING THE GVS OR THE PHILIPS RADAR THE SPEED CONSTANT SHOULD BE 7773.

STEP EIGHT

LIGHTS #1, #3 & #4 ARE ON: MANUAL SPEED CONSTANT



MANUAL SPEED CONSTANT CALCULATED VALUE:

THE ROW 1, 3, & 4 LIGHTS WILL BE ON. THE DISPLAY WILL READ THE CURRENT SPEED CONSTANT FROM MEMORY. SET THE CALCULATED SPEED CONSTANT BY USING THE UP AND DOWN ARROW KEYS. THEN PRESS THE ENTER BUTTON TO STORE THE VALUE AND ADVANCE TO SETUP 9.

FOR MORE INFORMATION ON CALCULATING THE SPEED CONSTANT, SEE BELOW.

CHANGING A SETUP VALUE:

1. PRESS THE SET-UP KEY TO GET INTO THE SETUP FUNCTION.
2. PRESS THE ENTER KEY UNTIL YOU'RE IN THE SETUP FUNCTION THAT YOU WANT TO CHANGE.
3. MAKE THE CHANGES WITH UP AND DOWN ARROW KEYS.
4. PRESS THE ENTER BUTTON TO SAVE THEN IT WILL ADVANCE TO THE NEXT SETUP FUNCTION.
5. PRESS THE SET-UP BUTTON TO RETURN TO OPERATE FUNCTION. RESTART THE MONITOR BY TURNING IT OFF & ON.
6. IF YOUR MONITOR IS DISPLAYING A SPEED OF 8.0 MPH AND YOUR TRUE SPEED IS 7.0 MPH YOU CAN ADJUST YOUR SPEED CONSTANT TO REDUCE THE 8.0 MPH TO 7.0 MPH.

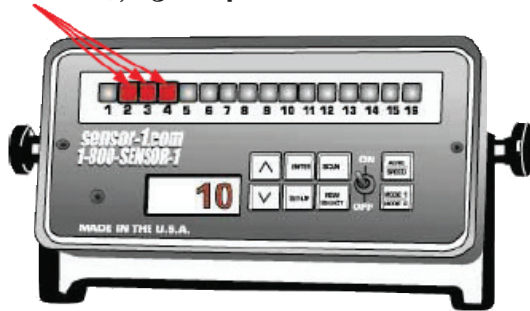
NOTE: "F" MEANS FIXED SPEED

EXAMPLE:

IF YOUR SPEED CONSTANT IS 7773 AND THE SPEED ON THE MONITOR IS 8.0 MPH AND YOU WANT TO REDUCE IT TO 7.0 MPH, INCREASE THE 7773 TO 8000 AND CHECK THE SPEED AGAIN. USE SET-UP 8 WHERE LIGHTS 1, 3 & 4 ARE ON TO MAKE MANUAL ADJUSTMENTS.

STEP NINE

LIGHTS #2, #3 & #4 ARE ON FOR “LIGHT INTENSITY”



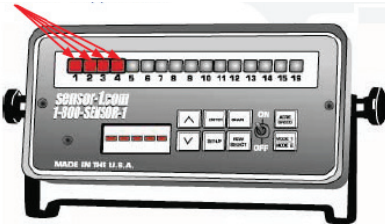
NOTE: THIS SETTING IS FOR PREFERENCE ONLY.

LIGHT INTENSITY:

- THE ROW 2, 3 & 4 LIGHTS WILL BE ON.
- SET THE LIGHT INTENSITY BY USING THE UP AND DOWN ARROW KEYS.
- INTENSITY 1 IS THE DIMMEST WHILE INTENSITY 10 IS THE BRIGHTEST.
- THE PRE-SET VALUE IS 10.
- PRESS THE **ENTER** BUTTON TO STORE THE VALUE AND ADVANCE TO SETUP 10.

STEP TEN

LIGHTS #1, #2, #3 & #4 ARE ON FOR “HOPPER SENSOR”



HOPPER LEVEL SENSOR:

THE ROW 1, 2, 3 & 4 LIGHTS WILL BE ON FOR THIS SETUP. USE THE **UP** OR **DOWN** ARROW KEY TO INDICATE IF YOU HAVE A HOPPER SET UP.

YOU WILL SEE “----” IF THERE IS NO HOPPER AND “**HOP**” IF YOU HAVE A HOPPER.

TROUBLESHOOTING

THE GENERAL PROCEDURE, IF A PROBLEM OCCURS, IS TO ISOLATE THE CAUSE TO:
(IN THE FOLLOWING ORDER)

1.A SENSOR 2.SENSOR LEAD 3.PLANTER HARNESS 4.CONSOLE CABLE 5.THE CONSOLE

MAKE NECESSARY REPAIRS AFTER PROBLEM HAS BEEN ISOLATED.

SEED SENSORS:

THE INFRARED (POPULATION SENSOR) OR SEED FLOW SENSORS ARE MOUNTED IN EACH PLANTER SHANK, NEAR THE BOTTOM OF THE SEED SENSORS DELIVERY TUBES.

THIS LOCATION ENABLES THE SENSORS TO QUICKLY DETECT CLOGS OR ABSENCE OF SEED FLOW FROM THE HOPPER. AS SEEDS FLOW THROUGH THE SENSOR, THEY INTERRUPT THE BEAM OF LIGHT BETWEEN THE LIGHT EMITTING DIODE (LED) AND THE PHOTO DIODE DETECTOR. SINCE PLANTER OR DRILL SHANKS DIFFER WITH DIFFERENT PLANTER OR DRILL MODELS, SENSORS ARE DESIGNED FOR SPECIFIC PLANTER MODELS AND ARE SOMETIMES NOT INTERCHANGEABLE BETWEEN PLANTERS. THE INFRARED SENSORS WILL DETECT CORN, SOYBEAN, COTTON, BEETS, PEANUTS AND MOST OTHER SEEDS NORMALLY PLANTED.

TESTING THE SEED SENSORS:

NOTE: FLO = MEANS NO SPEED INPUT....RESET SPEED CONSTANT

WHEN A ROW IS FAILING, MOVE THE SENSOR TO ANOTHER ROW. IF THE PROBLEM FOLLOWS THE SENSOR, THE SENSOR IS THE PROBLEM. CHECK FOR EXCESSIVE DIRT INSIDE THE TUBE. IF THE PROBLEM DOES NOT FOLLOW THE SENSOR, THE PROBLEM IS IN YOUR HARNESS OR MONITOR. IN SOME CASES, STATIC ELECTRICITY MAY CAUSE DUST AND SEED TREATMENT TO ACCUMULATE ON THE SENSING ELEMENTS IN THE SENSOR. ENOUGH MAY ACCUMULATE TO CAUSE THE SENSOR TO MALFUNCTION, WHICH CAN CAUSE THE MONITOR TO INDICATE A FAILURE CONDITION. LOW HUMIDITY AND DRY SOIL CONDITIONS TEND TO CAUSE THIS CONDITION. WHEN THIS OCCURS, CLEAN THE INSIDE OF THE SENSORS BY USING A DRY BOTTLE BRUSH. CHECK FOR CUT OR DAMAGED WIRES. IF THE SENSOR LEADS ARE DAMAGED, CAREFULLY CUT AWAY THE CABLE COVERING OF THE DAMAGED AREA. REPAIR DAMAGED WIRE OR WIRES BY SOLDERING WIRES TOGETHER, BEING SURE TO MATCH WIRE COLORS. TAPE EACH REPAIRED WIRE AND THE CABLE COVERING. TIE DOWN THE CABLE SO THAT THE SAME TYPE OF DAMAGE WILL NOT OCCUR AGAIN. TO TEST THE SENSOR WITHOUT A SENSOR TESTER, GET A 9-VOLT BATTERY. CONNECT THE BATTERY TO THE SENSOR, RED TO RED (+) AND BLACK TO BLACK (-). CONNECT A 12-VOLT AUTOMOTIVE TEST LIGHT BETWEEN THE GREEN WIRE AND THE BLACK WIRE. YOU SHOULD GET 5-8 VOLTS BETWEEN THESE TWO WIRES. WHEN SEEDS ARE DROPPED DOWN THE TUBE, IF THE SENSOR IS WORKING, THE GREEN WIRE GOES TO GROUND AS THE SEED PASSES THROUGH THE LIGHT BEAM. BE SURE THE SENSOR IS SHADED. IF THE SENSOR IS FLOODED WITH SUNLIGHT OR ARTIFICIAL LIGHT IT WILL NOT BE ABLE TO CALIBRATE ITSELF. IF THE SENSOR STILL DOES NOT WORK, YOU NEED TO REPLACE IT.

PLANTER HARNESS:

EXAMINE THE PLANTER OR DRILL HARNESS FOR DAMAGE. IF THE HARNESS IS CUT OR PINCHED, CAREFULLY CUT AWAY THE CABLE COVERING, REPAIR DAMAGED WIRE OR WIRES BY SOLDERING WIRES TOGETHER, BEING SURE TO MATCH WIRE COLORS.

TAPE EACH REPAIRED WIRE AND THE CABLE COVERING. IF NECESSARY, MOVE AND SECURE CABLE SO THAT THE SAME TYPE OF DAMAGE WILL NOT OCCUR AGAIN.

CONSOLE CABLE:

EXAMINE CONSOLE CABLE FOR DAMAGE. IF HARNESS IS CUT OR PINCHED, CAREFULLY CUT AWAY THE CABLE COVERING. REPAIR DAMAGED WIRE OR WIRES BY SOLDERING WIRES TOGETHER, BEING SURE TO MATCH WIRE COLORS. TAPE EACH REPAIRED WIRE, AND THE CABLE COVERING. IF NECESSARY, MOVE AND SECURE CABLE SO THAT THE SAME TYPE DAMAGE WILL NOT OCCUR AGAIN.

ACRES:

TO SET THE ACRES (HECTARES) BACK TO ZERO, TURN THE MONITOR OFF AND THEN BACK ON. IF THEY DO NOT CLEAR, GO INTO SETUP AND CLEAR THE ACRES (HECTARES) BACK TO ZERO. IF THAT DOES NOT WORK, YOU WILL NEED TO SEND THE MONITOR BACK IN TO US FOR MONITOR REPAIR. THE PROBLEM IS USUALLY THE MEMORY CHIP IN THE UNIT. BEFORE YOU DO THIS, MAKE SURE YOUR SPEED IS NOT OFF.

ZERO ACRES COUNTER:

TO ZERO OUT THE ACRES COUNTER PRESS THE ACRES COUNTER BUTTON DOWN FOR 5 SECONDS.

SET-UP QUICK CHART:

Function	Set-Up	Led 1	Led 2	Led 3	Led 4
Sensors	1	■			
Rows	2		■		
Spacing	3			■	
High Pop.	4				■
Low Pop.	5	■			■
Pop. Gain	6		■		■
Speed Counter (200 Ft. Set-Up)	7			■	■
Speed Set (Manual Set-Up)	8	■		■	■
Light Intensity	9		■	■	■
Hopper Level Sensor	10	■	■	■	■

ACRES/SPEED BUTTON: **NEW FEATURE**

AFTER PRESSING THE ACRES/SPEED BUTTON, THESE ARE THE SYMBOLS THAT WILL SHOW SPEED, SEED SPACING, FIELD AND TOTAL ACRES.

-- SYMBOL IS THE SPEED

= SYMBOL IS THE SEED SPACING/INCH

= SYMBOL IS THE FIELD ACRES

NO SYMBOL IS THE TOTAL ACRES

SP = SPEED FAILED

THE MONITOR HAS A SPEED CONSTANT AND SPEED IS EQUALLY TO ZERO.

SC = SPEED CONSTANT = 0

INFORMS THE OPERATOR THAT THE SPEED CONSTANT IS EQUAL TO ZERO.

ADJUST SPEED ON THE FLY: **NEW FEATURE**

IF YOU ARE NOT SATISFIED WITH THE SPEED WHILE VIEWING THE SPEED ON THE MONITOR, PRESSING THE UP AND DOWN ARROWS WHILE PLANTING WILL INCREASE OR DECREASE THE MANUAL SPEED SETTING BY 10 EACH TIME THE CORRESPONDING ARROW IS PUSHED. BEFORE THIS WILL WORK, YOU MUST HAVE THE SPEED DISPLAY ON THE MONITOR. THEN, WHEN YOU PRESS THE UP OR DOWN ARROW KEYS, THE SPEED CONSTANT MANUAL OR FUNCTION WILL CHANGE. YOU WILL BE LOOKING AT THE SPEED AND CAN SEE THE SPEED CHANGE AS YOU ENTER A HIGHER OR LOWER VALUE FOR THE MANUAL SPEED CONSTANT. THIS WILL HELP YOU TO ADJUST THE SPEED ON THE FLY VERSUS GOING INTO SETUP AND ADDING OR SUBTRACTING THE MANUAL SPEED CONSTANT. IF YOU ARE USING A FIXED SPEED SUCH AS -4.5 THEN HE CAN ADJUST HIS FIXED SPEED BY .1 MILE PER HOUR.

ZERO OUT THE ACRES COUNTER: **NEW FEATURE**

TO ZERO OUT THE FIELD AND TOTAL ACRES COUNTER, PRESS THE ACRES/SPEED COUNTER BUTTON DOWN FOR 5 SECONDS. YOU WILL HEAR TWO BEEPS AND THEN THE FIELD ACRES WILL ZERO OUT. IF YOU CONTINUE TO HOLD THE ACRES/SPEED BUTTON, YOU WILL HEAR TWO BEEPS AND THE TOTAL ACRES WILL ZERO OUT.

ROW ELIMINATOR:

THE MONITOR HAS THE CAPABILITY TO ELIMINATE A ROW OR ROWS. FOR EXAMPLE, A SPLIT ROW PLANTER HAS A 12 ROW MONITOR AND HE WANT TO PLANT 6 ROWS AND WANTS TO SHOW ROWS: 1, 3, 5, 7, 9 & 11 AND WANT TO ELIMINATE ROWS 2, 4, 6, 8, 10 & 12. TO DO THIS PRESS THE SETUP KEY AND PRESS THE ROW SELECT BUTTON AND ALL 12 LIGHTS COMES ON. THEN PRESS THE UP ARROW KEY IF YOU WANT ROW 1 TO BE ON OR DOWN ARROW IF YOU WANT IT TO BE ELIMINATED. THEN ROW 2 WILL FLASH, PRESS THE UP OR DOWN ARROW KEY TO DETERMINE IF YOU WANT ROW 2 TO BE ON OR OFF. ONCE YOU PRESS THE UP OR DOWN ARROW KEY THE LED LIGHT WILL ADVANCE TO THE NEXT ROW. DO THESE FOR ALL 12 ROWS. AFTER YOU ARE DONE, PRESS ENTER AND IT WILL CHANGE YOUR NUMBER OF SENSORS TO WHATEVER YOU DID NOT ELIMINATE. THIS WILL WORK ON MONITORS WITH 4, 6, 8, 12, 13, OR 16 ROW CONFIGURATIONS.

NOTES

NOTES

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