2020
WITH AN EYE TO THE FUTURE
ULTIMA™

INSTALLATION AND OPERATION INSTRUCTIONS

It has been said many times before: **"When all else fails, read the instructions".**

While the ULTIMA™ is easy to install and adjust, spending a few minutes now to read and understand these instructions can save a lot of frustration and possible product damage later on.

ITEMS CONTAINED IN THIS PACKAGE:

(1) - Display Module
(1) - Brake Arm Bracket Assembly
(2) -1 1/2" Screws
(2) - #8 Set Screws
(1) - #6 Lockwasher
(1) - #6 Hex Nut
(3) - 3/8" Sheet Metal Screws
(1) - 2 Foot Length of Plastic Cable Wrap
(1) - Control Module
(1) - Cable Clamp Bracket
(2) - #8 Lockwashers
(1) - #6 Machine Screw
(1) - #6 Flatwasher
(2) - Allen Wrenches
(2) - Plastic Cable Clamps
(1) - Warranty Card
(1) - Installation and Operation Instruction Booklet

For technical advice or troubleshooting call:
1-800-533-0306
8:00 A.M. - 4:30 P.M. EST, Monday through Friday

KEEP THESE INSTRUCTIONS IN THE TOW VEHICLE FOR FUTURE REFERENCE.

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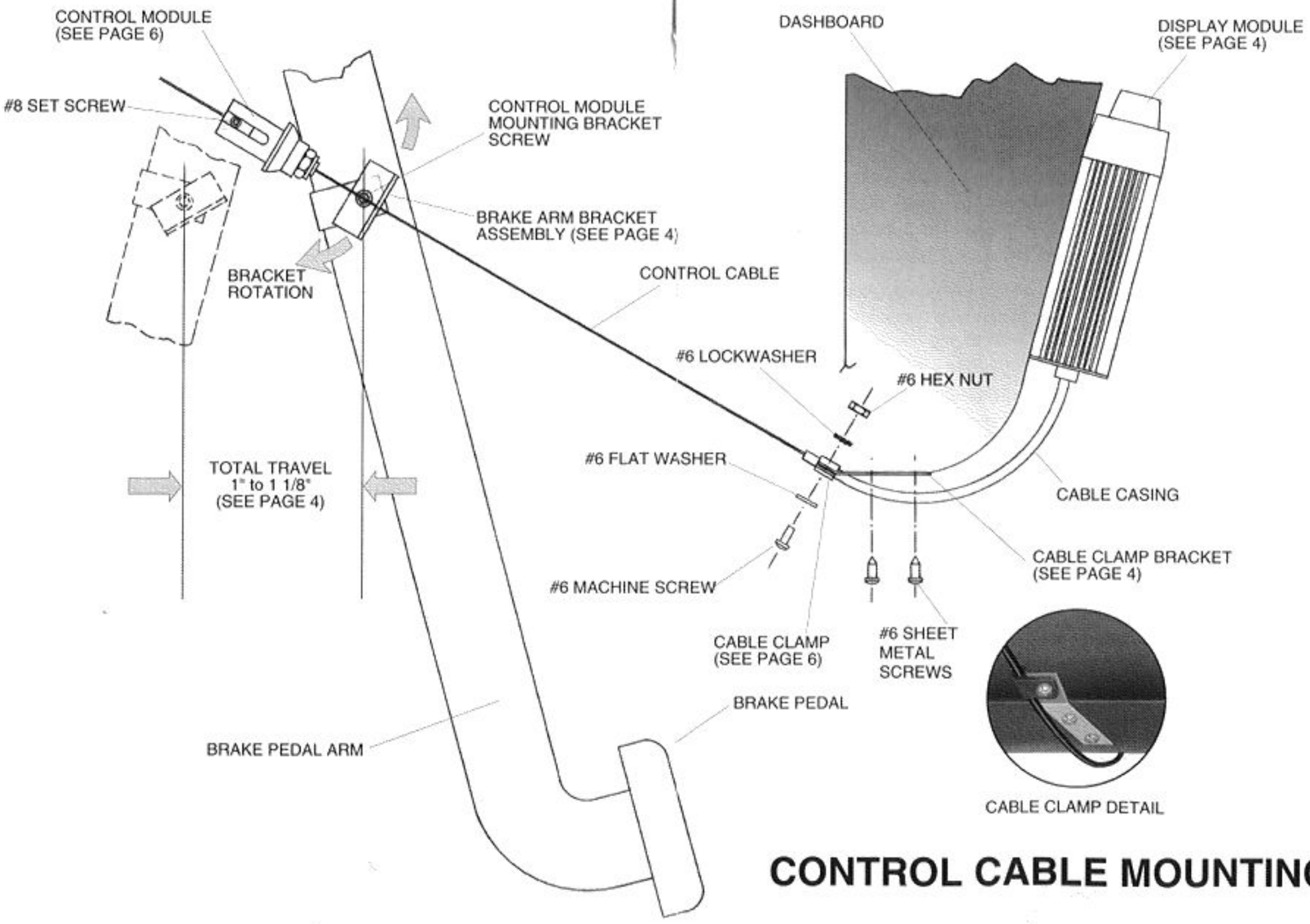


CONTROL CABLE MOUNTING

MOUNTING THE BRAKE ARM BRACKET ASSEMBLY

Insert the (2) #8-32 set screws into the Brake Arm Bracket Assembly. Place it on the left or right side of the Brake Pedal Arm as high up the arm as possible and tighten the screws just enough to hold it in place.

With the tow vehicle engine running, have someone step on the brake pedal. You will be measuring the travel of the Brake Arm Bracket Assembly from no brakes to full panic braking. Slide the Brake Arm Bracket Assembly down the Brake Pedal Arm until you reach a point where the total travel is between 1" to 1 1/8". This measurement is very critical to the operation of the Ultima™ Braking System. Too much travel may result in breaking the Control Cable. Once the location of the Brake Arm Bracket Assembly has been established, tighten the set screws with the small Allen Wrench provided.

The forward screw should be tightened until the bracket starts to distort or pull away from the Brake Pedal Arm. The rear screw should then be tightened until it touches the Brake Pedal Arm.

Using the large Allen Wrench provided, loosen the Control Module Mounting Bracket Screw slightly and rotate the Bracket until you get a straight line sight path to the edge of the dashboard. Tighten the screw.

MOUNTING THE CABLE CLAMP BRACKET

Due to the various shaped dashboard configurations, the Cable Clamp Bracket will have to be bent to conform to the shape of your particular vehicle's dashboard.

Position the Bracket so that it is in line with the center of the Control Module Mounting Bracket, and the angled tab is facing upward and is clear of the edge of the dashboard. Using your fingers or a pair of pliers curve or bend the Bracket until you can mount it flat on the dashboard. Mark the location of the Bracket Mounting Holes, and drill two (2) 1/8" (.125) diameter holes through the material at the chosen location. Be careful not to drill through any wires or components on the other side. Mount the Cable Clamp Bracket with the two (2) 3/8" long Sheet Metal Screws provided.

MOUNTING THE DISPLAY MODULE

While the Display Module must be mounted to a solid, non-moving surface, its location is only limited to driver access to the front panel. This location is determined by the installer in conjunction with the tow vehicle owner's preference.

Mark the location of the Display Module with a pointed tool using the holes in the housing or by measuring the holes one inch (1.00) apart. Drill two 1/8" (0.125) diameter holes through the material at the chosen location, being careful not to drill through any wires or components on the other side.

WARNING: Do not drill through the Display Module Housing Mounting Holes, as the drill bit might snag on the insulation tubes inside the Display Module and cause damage to them or other components inside the housing.

Mount the Display Module using the two (2) 1 1/2" sheet metal screws and lockwashers provided.

CONNECTING THE CONTROL CABLE

The Control Cable Casing can then be routed from the Display Module to the left or right side of the steering column to line up with the Cable Clamp Bracket. Check the end of the Control Cable Casing to be sure it is inside the Display Module.

Choose the shortest and most direct path for the Control Cable to reach from the Display Module through the Cable Clamp Bracket to the Control Module, avoiding sharp bends. Mark or measure the Control Cable Casing at a point which is approximately 1/2" longer than the edge of the Cable Clamp Bracket.

Remove the Control Cable Casing from the Display Module by pulling it away from the Module. With a knife or other sharp tool, cut the Control Cable Casing at the marked location. Feed the cable into the casing, and push it back into the Display Module until it is firmly in place.

WARNING: Do not cut the Control Cable Casing without removing it from the Control Cable as you may nick the Control Cable and cause a weak point which may fracture and break in the future.

Slip the Plastic Clamp over the Control Cable Casing. Mount it with the Short Leg of the Plastic Clamp against the Cable Clamp Bracket using the hardware provided. The flat washer must be against the Plastic Clamp and the lockwasher and Hex Nut must be against the Cable Clamp Bracket. (See Page 3)

Feed the Control Cable through the hole in the Control Module Mounting Bracket and into the hole on the Ball End of the Control Module. Pushing the Ball End of the Control Module into the Control Module Mounting Bracket and putting a small amount of tension on the Control Cable, check the path of the Control Cable. Adjust the Cable Clamp if necessary to obtain a straight line between the Control Module and the Control Cable. Do not clamp the Control Cable in the Control Module at this time.

NOTE: The Control Module contains a Spring Loaded Piston which is provided to prevent damage to the Control Cable in the event that hydraulic pressure is lost in the tow vehicle's braking system. If the piston comes out of the Control Module in normal braking, the Brake Arm Bracket Assembly is mounted too far down on the Brake Pedal Arm. (See Page 4.)

A second Cable Clamp and 3/8" long sheet metal screw is provided in the package. It is used to stabilize the center of the Control Cable Casing for long runs and hold it to the dashboard. It is mounted by drilling a 1/8" (.125) diameter hole in the dashboard.

WIRING THE DISPLAY MODULE

If your tow vehicle has been pre-wired at the factory with a trailer towing package and harness, wire the Display Module per the tow vehicle manufacturer's instructions and proceed to step #4.

If you are replacing any brand of brake control other than a JORDAN RESEARCH model, the wiring used for that control may be used to wire the Display Module. The "white-ground" and the "blue-trailer brake" wires should be attached to the "white" and "blue" wires of the ULTIMA™. The "black-12 volt positive" wire will be attached to the "red-12 volt positive" wire of the ULTIMA™, and the "red-stop light" wire should be cut off and discarded.

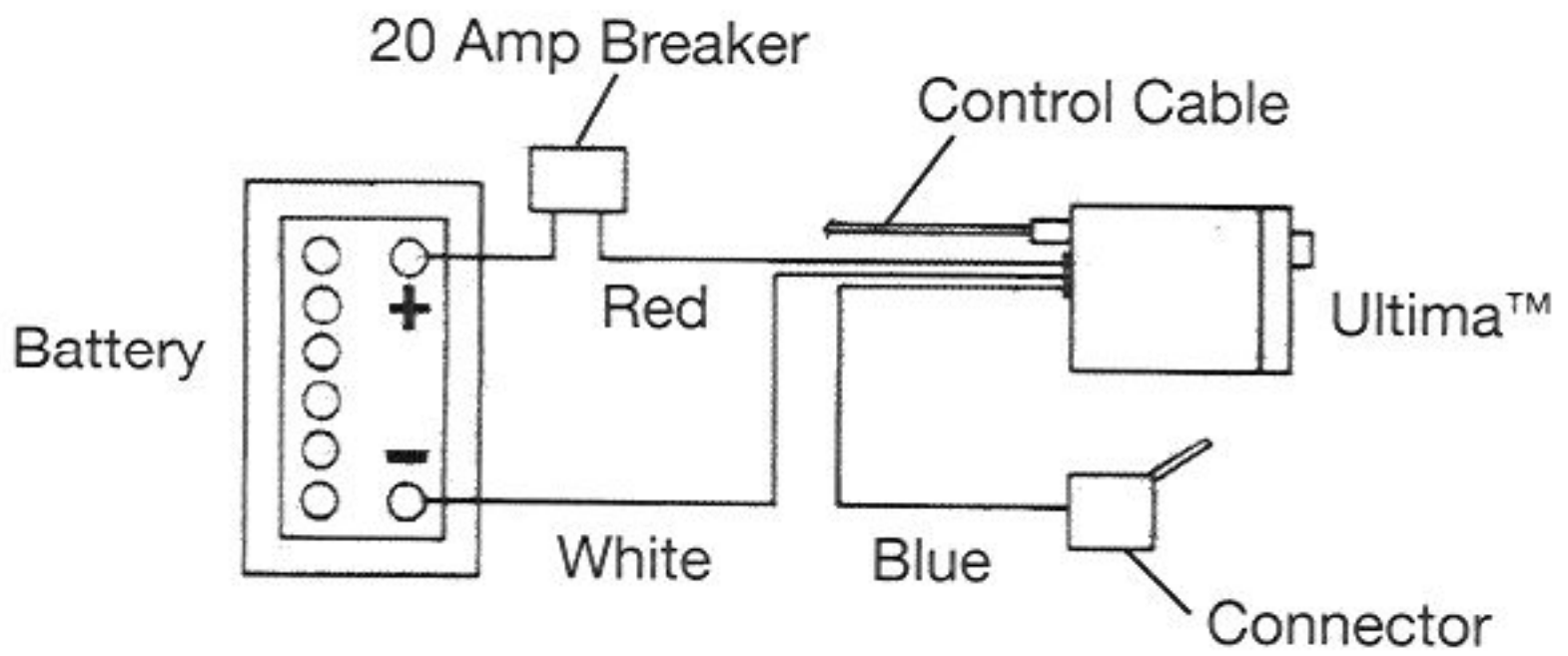
If this is a new installation, the minimum wire gauges are as follows: (use stranded wire only!) 2 and 4 brakes - 14 gauge, 6 brakes - 12 gauge.

Whatever wire gauge is used, the same gauge wire must be used for all of the connections to the Display Module.

WARNING: The Display Module must he wired to a 12 volt negative ground system only! Reversal of the red (battery) and white (ground) wires will destroy the electronics of the Display Module. Do not use the accessory or fuse panel in the tow vehicle for any connections to the Display Module, as this could cause damage to the existing wiring or other components of the tow vehicle.

NOTE: The use of insulated, solderless, crimp-on butt connectors is recommended for all wiring. Loose connections may result in intermittent operation or no trailer brakes. When passing wire through sheet metal, always go through an existing grommet, add a grommet, or use silicon rubber to insulate the wire from the hole.

Route all wires as far away from the radio, C.B., or cellular telephone antenna as possible to reduce noise.



WIRING DIAGRAM

1. WHITE WIRE (GROUND)

Using the appropriate hardware, connect the white wire (ground) to the negative (-) terminal of the battery.

WARNING: Units which are not grounded to the negative (-) terminal of the battery may not operate, or may operate intermittently.

2. RED WIRE (BATTERY)

Mount a 20 amp auto-reset circuit breaker as close to the positive (+) battery terminal as possible. Using the appropriate hardware, connect the "BATT" side of the circuit breaker to the positive (+) battery terminal. Connect the red wire (battery) to the "AUX" side of the circuit breaker.

3. BLUE WIRE (BRAKES)

Connect the blue wire (brakes) to the brake wire terminal on the tow vehicle's trailer connector.

4. After all the wire connections have been made, bundle the wires together: Cover the wires by rolling the Plastic Cable Wrap, which is provided, around the wires making a tight cover for them. Cut any excess Plastic Cable Wrap with a sharp knife or scissors, being careful not to nick the insulation of the wires.

Turn the Output control located on the front of the display Module to the full clockwise (maximum) position.

Plug the trailer and tow vehicle together at the connector: The Continuity L.E.D. should light, indicating that it senses the trailer magnets. If it does not light, check the troubleshooting chart in the back of these instructions.

Being careful not to move the tow vehicle brake pedal, make sure the Ball End of the Control Module is seated in the large hole of the Control Module Mounting Bracket. Grasp the Control Cable with your fingers and pull on it where it exits the Control Module until the Ammeter Display just turns on.

Release the cable until the Ammeter Display just turns off. Tighten the set screw with the small Allen Wrench provided.

Cut off the excess Control Cable approximately 1" from where it exits the Control Module.

To facilitate removal of the Control Module for service or when you do not have a trailer in tow, a slot has been provided in the Control Module Mounting Bracket. By pulling on the Control Module, the Cable can be removed without disturbing any adjustments to the system and will turn off the Ammeter Display.

ADJUSTING AND TESTING OF THE SYSTEM

NOTE: All tests must be performed with the tow vehicle engine running and the trailer electrically connected to the tow vehicle.

The Continuity L.E.D. should be illuminated whenever the trailer and tow vehicle are electrically connected. If not, a problem is indicated. Refer to the Troubleshooting Chart in the back of these instructions.

With the "Green" Continuity Indicator illuminated, each time the tow vehicle brakes are applied or pressure is exerted on the Manual Button, a digital reading, in amperes, should appear on the front of the Display Module.

If there is no digital display and/or there is only a decimal point on the Ammeter; a problem is indicated and the Display Module should be returned for service.

A reading of 88.8 would indicate there is a short circuit somewhere which must be corrected before proceeding with any tests or moving the vehicles. If this reading occurs while driving, you will not have trailer brakes and the problem must be corrected to insure safe travel.

With the "Output Control" set at "maximum" (fully clockwise) and the "Green" Continuity Indicator illuminated, fully depress the Manual Button. Since each magnet will draw 2.5 to 3.0 amps, the following readings are normal:

2 brakes = 5 to 6 amperes
4 brakes = 10 to 12 amperes
6 brakes = 15 to 18 amperes

NOTE: Because of system variances, readings may be less than the minimum indicated on the chart. If this occurs, additional tests must be performed to confirm their operation. Pulling the break-away switch in not an indicative test and is not recommended.

A simple method to check the operation of any magnet is with a compass. Place the compass near the bottom center point of the wheel of the magnet to be tested and have someone activate the brakes. The needle of the compass should deflect indicating the magnet is energized. If a problem is indicated, repairs should be implemented before proceeding with any tests or moving the trailer.

Once it has been established that the electrical system is complete and operating, note the reading for your particular tow vehicle/trailer combination and record it for future reference.

1. Press the Manual Button all the way inward until it stops.

2. Turn the Output Control counterclockwise until the ammeter reads:

   3.5 amps for 2 brakes
   7.0 amps for 4 brakes
   10.5 amps for 6 brakes

3. Release the Manual Button. The Digital Display should turn off. If it does not, check the Troubleshooting Chart.

4. With this adjustment made, tow the trailer on a dry, hard surface at 20-25 miles per hour.

5. Press the Manual Button fully on.

   A. If the trailer brakes do not lock up, rotate the Output Control clock wise, and increase the Digital Readout by increments of 0.2 amperes until they do.

   B. If the trailer brakes lock up, rotate the Output Control counter clockwise, and decrease the Digital Readout by increments of 0.2 amperes until they do not.

TROUBLESHOOTING GUIDE

SITUATION	PROBABLE CAUSE
Green Continuity Light is not illuminated when trailer is electrically connected.	1. The trailer is connected with an open circuit on brake line. 2. Corrosion on trailer plug contacts. 3. Loose 12 volt connection.
Green Continuity Light is illuminated but no digits appear when applying brakes (trailer brakes function).	1. Output adjustment is too low. 2. Defective Display Module.
Green Continuity Light is illuminated without a trailer connected.	1. Brake wire (blue) connected to wrong pin in tow vehicle connector. 2. Wire shorted in tow vehicle or connector.
Green continuity light dims or goes out with brake application.	1. Normal operation.
Digits appear on the Ammeter screen without applying brakes.	1. Control Module is not adjusted correctly.
Readings of 00.3 to 1:00 appear on the ammeter when brakes are applied without the trailer attached.	1. Normal operation
Brakes are aggressive or lock up at low ammeter readings.	1. Loose trailer brake adjustment. 2. Bad ground condition.
88.8 appears on ammeter (trailer brakes inoperative).	1. Short circuit in system.
Decimal Point only.	1. Defective Display Module.