

MicroLevel

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What is Microlevel?

MicroLevel is a microprocessor based ride height controller for the 1973 to 1978 GMC 260 and 230 motor homes.

It is designed to replace Power Level and Electro Level system functionality while adding improvements such as push button calibration and campground leveling.

Kit Contents

- Microlevel Controller
- 2 Valve blocks (4 valves)
- 2 ride height sensors with custom brackets
- Sensor wiring harness
- Key Fob 4 channel RF remote
- Dimmer

Operation

Manual mode:

Manual mode is similar to the stock system with the addition of a wireless RF remote. It allows the rear height to be adjusted up and down manually. There is a push button on the front panel that raises and lowers both sides together.

RF Remote:

The remote allows raising and lowering each side independently from outside (or inside) the coach. It has the following features. (Left is Drivers Side)

- Left Up
- Left Down
- Right Up
- Right Down

The Remote has a range of 40-50 feet so it can be used outside the coach even at the rear. It's great for when dumping, you can make it squat or tilt for better flow. Tire changing can now be done much easier as you can inflate and deflate without getting in and out of the coach 10 times.

Travel mode:

Travel mode is also similar to the stock system. It keeps the coach at a calibrated ride height even under varying load conditions. Using a microprocessor allows for better and more intelligent control. For example the stock system uses a fixed delay in travel mode. This means it reacts the same in all conditions. When adjusting initially it reacts too slow and allows overshoot, when already at ride height it reacts too fast causing hunting and unnecessary adjustments around corners and in crosswinds.

MicroLevel on the contrary adjusts quickly initially, then slowly once at height. This reduces time to height and unnecessary adjusting.

MicroLevel

Keith Vasilakes

January 2018

Camp mode:

Camp mode is a new mode. It uses an accelerometer to level the coach for camping. Pull into the campsite, Press the camp button and wait for leveling to complete. As long as the campsite is within the leveling capabilities of the coach it will level automatically.

Hardware

Controller:

The **Microlevel** controller uses a microprocessor running custom software. It contains an automotive capable power supply, a 3 axis 14 bit accelerometer, an LED Driver and FET solenoid drivers.

Microlevel is designed to fit into the stock location. The front panel is laser cut Plexiglas with 3D printed buttons. The front panel is available in clear or black as shown in Illustration 1: Front Panel Note that the Microlevel logo is lit up when on and the Icons are back lit when active.

The left most button is **Manual Mode** (up/down) control. Pressing and releasing the top cause both sides of the coach to raise. Press the top or bottom to select **Raise Mode** or **Lower Mode** respectively. Press again to enter **Hold Mode** or press any other button to switch to that mode

The center button is **Travel Mode**. Press to put **Microlevel** into **Travel Mode**. Pressing a second time puts **Microlevel** into **Hold Mode**.

1. The right most button is **Camp Mode**. Press once to enter **Camp Mode**, press again to return to **Hold Mode**. **Microlevel** will level to the horizon, within the limits of the suspension of course. When all 4 Arrows are off and stay off the coach is level. If you move around the coach it may cause it to relevel. If the coach cannot be leveled the Arrows will indicate what is wrong. So If the Right UP Arrow is on put blocks under the right wheel. The coach can be moved while leveling to find a more level spot.

Re-level can be done at any time just by pressing the Camp button.

Microlevel turns on with the ignition, illuminating the logo. If the ignition is off and a button on the front panel or on the remote is pressed **Microlevel** wakes up and performs the operation requested.

Microlevel will return to sleep only once nothing is active.

Height sensors:

Microlevel is supplied with electronic non contact Delphi height sensors rather than the high/low switches found in the OEM system. Using these sensors allows push button height calibration and eliminates the need to settle the suspension after setting. Set once and it's done. **Microlevel** is sensor agnostic, any sensor with a 0 to 5 volt output can be used if you really want to.

Solenoid valves:

Microlevel uses 4 solenoid valves, 2 per side. 1 Fill valve and 1 dump valve. The valves can be mounted anywhere. There is only a single air line running from each valve pair to its air bag.

MicroLevel

Keith Vasilakes

January 2018

Compressor control:

Microlevel is capable of controlling the compressor, through a relay, this allows the remote to wake up the controller and start the compressor without the need to turn the ignition on. This is highly recommended for best operation.

RF remote:

Microlevel includes a 4 button RF remote. This remote allows independent up and down control of each side from up to 50 feet away. Great for surprising your friends! The remote works even if **Microlevel** is off. **Microlevel** will wake up, enable the compressor and raise or lower as commanded. A minute later **MicroLevel** will go back to sleep.

Calibration

There are 2 calibrations that must be done.

Calibration only needs to be done on installation or if the controller mounting is disturbed as positioning of the accelerometer is very sensitive. Otherwise the controller will remember both calibrations even if all power is lost.

***Note that MicroLevel MUST be securely mounted before camp calibration!!**

Travel height:

This sets the height the controller will use in travel mode.

To use;

1. Park on a smooth level surface
2. Put the coach into travel mode.
3. Press the calibrate button.
4. Use the RF remote to adjust the height, you can go outside and measure the ride height.
5. Press the calibrate button again.

Camp Level:

This sets the side to side and front to back level of the motorhome.

To use;

1. Park on a smooth level surface.
2. Put the coach into camp mode.
3. Press the calibrate button.
4. Use the RF remote and a bubble level to level the coach.
5. Press the calibrate button.

Error conditions

If no height change is detected within 10 seconds, when raising or lowering, in Manual, Travel or

MicroLevel

Keith Vasilakes

January 2018

Camp, **Microlevel** will flash the up/down arrows. Check the Air compressor and manual bag shutoff valves. This may also happen if your compressor is small and the system is empty. No fear though, once the height starts changing the arrows will return to steady on. But if you are driving down the road and one side starts flashing, pull off and check to see what fell off. You might have lost a sensor or your compressor.

Installation

Power Level

1. Remove old stuff

1. **WARNING!** Vent the air system to **zero** PSI
2. Remove existing power level controller and disconnect air lines. Air lines can be removed from the dash area at this time.
3. Remove existing height sensors.
4. Disconnect air lines from the height switch.
5. Removal of the air lines from the height switch is optional, they are not needed for **MicroLevel** operation. Only the line to the airbag is required.

2. Height Sensors

1. Install new sensors, see Illustration 4: Height Sensor
 1. Adjust / Verify sensor position to eliminate binding or over travel at the ends of travel.
2. Feed right side (Passenger side) wire harness between the body and the frame using the cutouts for the air lines.
3. Plug harness into right side sensor.
4. Secure the harness to the brake like using zip ties to prevent movement and damage.
5. Plug harness into left side sensor.
6. Run harness through the wire loom along the left side used by the existing air lines all the way to the front of the coach
7. Feed harness through the firewall using the hole on the passenger side of the brake booster, and out the Power Level hole.
8. Connect the 4 sensor harness wires to **MicroLevel**
 1. V+ is the red power wire.
 2. R is the Right (Passenger side) sensor
 3. L is the Left (Drivers Side) sensor
 4. V- is ground

3. Valves

1. Mount the solenoid valve blocks, see Illustration 5: Valve Block, (a valve block is 2 valves, 1 raise, 1 lower). Make sure the exhaust is pointing down. This allows moisture/dirt etc to get blown out. A short piece of tubing keeps foreign material out and actually makes the valves perform better at low pressures.
2. Connect both valve blocks to the coach air supply.
3. Combine 1 wire from each solenoid to a single power wire, then connect the power wire to the VS (Valve Supply) terminal on the Microlevel.

MicroLevel

Keith Vasilakes

January 2018

4. Connect the other 4 wires to their proper terminals on the Microlevel.
 1. RU is Right UP
 2. RD is Right Down
 3. LU is Left Up
 4. LD is Left Down
4. **Compressor control** is optional but highly recommended as without it using the remote control will quickly run out of air making it kinda pointless.
 1. The Com(pressor) output is designed to turn on a relay to enable the compressor.
 2. It is expected there is a separate pressure controller to shut off the compressor.
 3. Connect one side of the relay coil to always on 12v and the other side to the Comp terminal of MicroLevel. MicroLevel will pull the COM output to GROUND to enable the compressor.
 4. The relay contacts are then connected to the battery and then to the compressor.
 5. A fuse must be installed between the relay and the battery of course.
5. **Power**
 1. Connect the Ground terminal to a good chassis ground
 2. Connect the Ign input to the ACC (recommended) or the IGN terminal on the fuse box depending on how you want the system to behave.
 3. Lastly connect the Batt terminal to a always on 12v power source.
 1. Use a 5 amp fuse
6. **Microlevel front panel**
 1. Uncoil the Antenna for best range and reliability. Just pull it open and let it hang. Keep away from big chunks of metal obviously
 2. Use the same 4 screws used to mount the original Power level Or ElectroLevel I/II
7. **Calibrate**
 1. Calibrate per instructions above.
***Note that MicroLevel MUST be securely mounted before camp calibration!!**
8. **Brightness**

Microlevel supports a brightness input. As nice as it would be the OEM dash dimer, it does not work well and is not recommended. The problem is that the dash light voltage is controlled by both the dimmer itself and by the headlight switch. When the headlights are off the dimmer voltage is zero so there is no way to know how bright the dimmer is when the headlights are off. The dimmer is also extremely noisy causing the brightness to jump around a lot, it's very annoying. So a separate brightness control is used.

 1. Using the supplied potentiometer
 2. Mount the pot in an accessible location
 3. Connect the Red wire to VS (it's a filtered power source)
 4. Connect the White wire to Dim
 5. Connect the Black wire to Gnd
 6. Adjust to your desired brightness level
9. **Radio Receiver**
 1. The radio receiver is installed into the outer socket as shown in Illustration 3: Radio placement.

MicroLevel

Keith Vasilakes

January 2018

- The other socket is unused at this time.

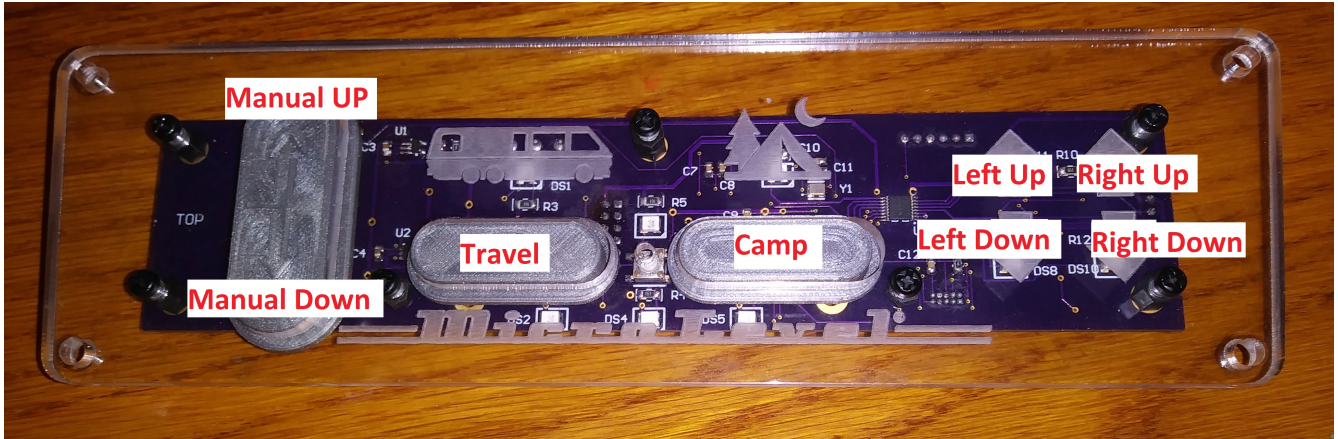


Illustration 1: Front Panel

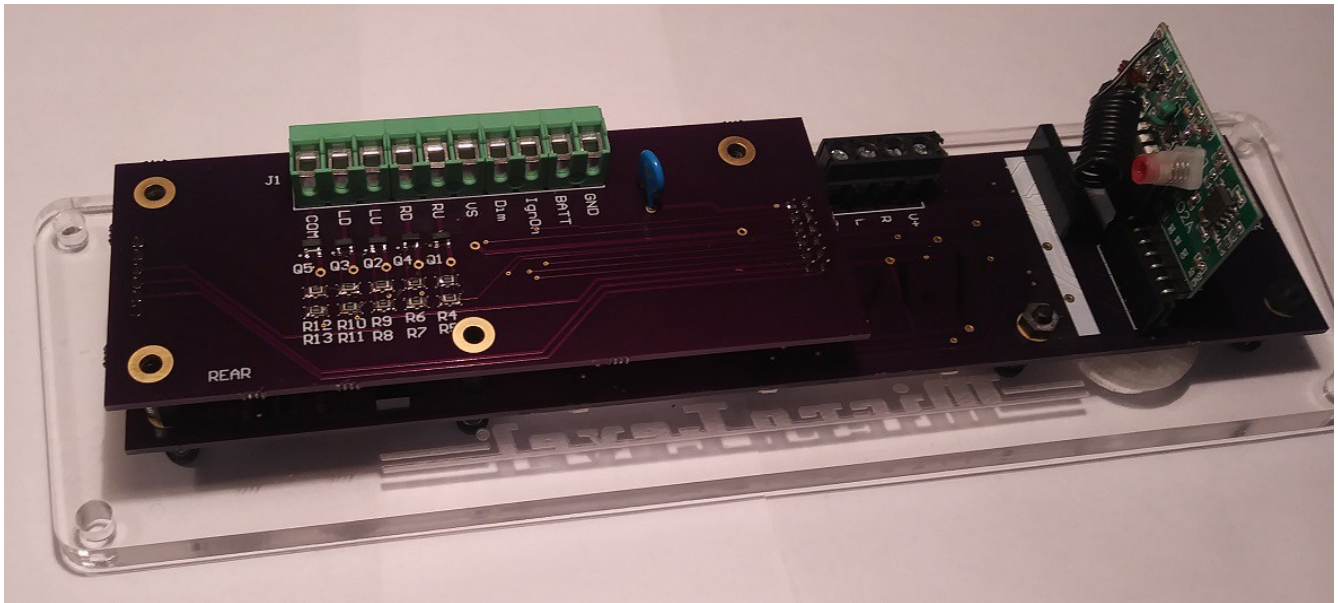


Illustration 2: Front panel Rear view

MicroLevel

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January 2018

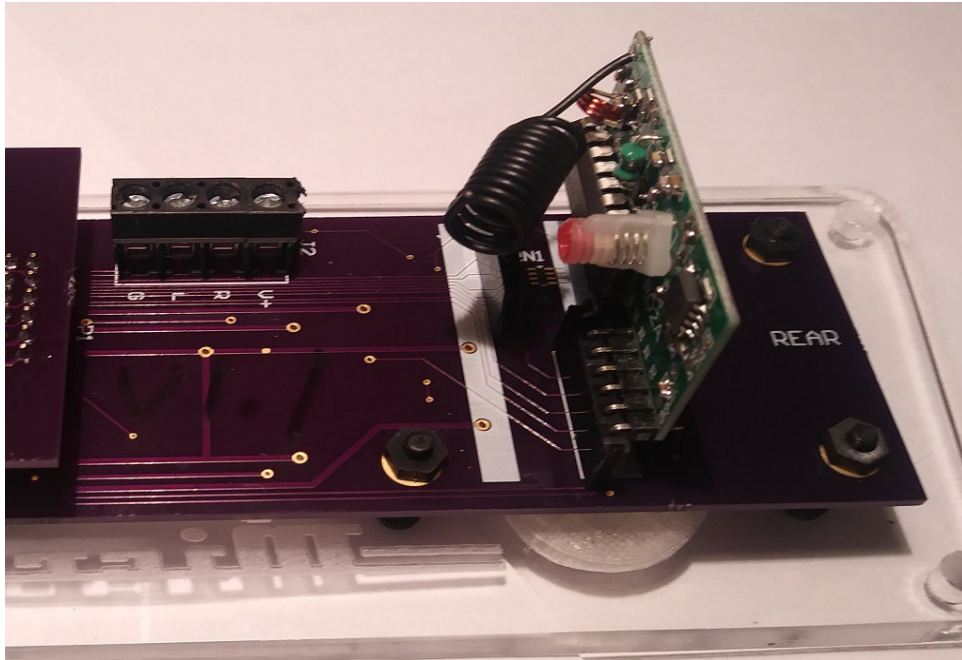


Illustration 3: Radio placement



Illustration 4: Height Sensor

MicroLevel

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Illustration 5: Valve Block