

# Ag-Xcellence BPM101 Installation and Operation Manual

## For New Holland 2-tie balers 5XX series, BC50X0 series, Hayliner 2X0 series and others.

Revision 5.0 8-14-2023

R3.1 Added Clarification on moisture sensor wiring in Step 6.

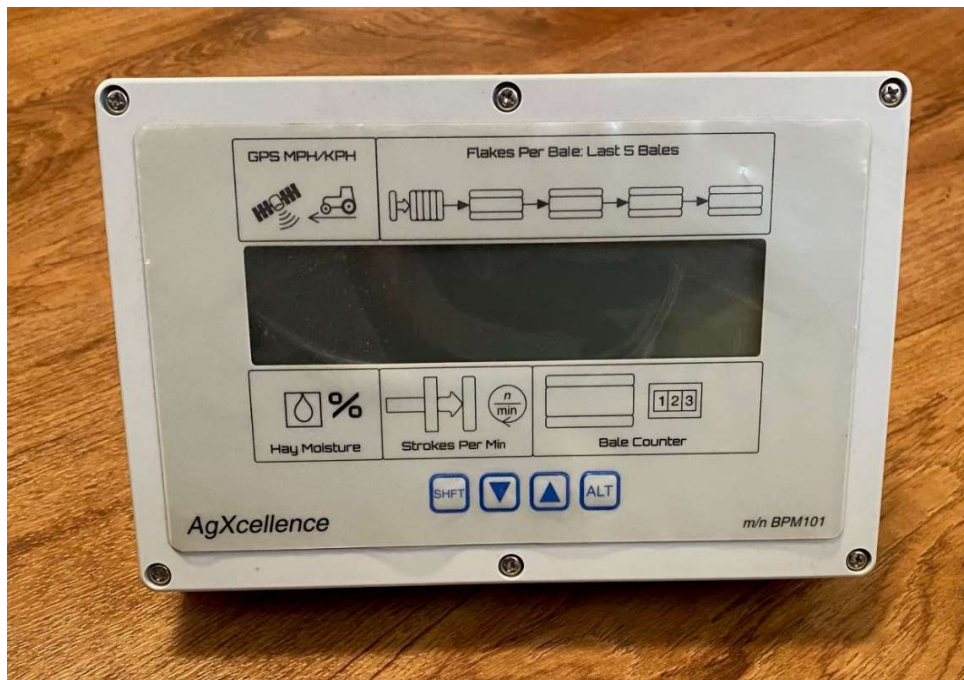
R4.0 Added correct clearance for newer stroke count sensors and more operation info.

R5.0 Updated Stoke and bale count sensor locations and added more detailed photos.

Call AgXcellence (509) 607-4374 for assistance if needed.

### List of parts

Monitor:



Ram Mount: Ball and Arm:



Cab harness:



Baler harness:



Stroke sensor and adaptor harness: **NOTE: Only used on S/N 005 through 064.**



Bale count/Stroke sensors. One required for S/N 064 and down. Two sensors required on S/N 065 and up:



L-shaped bracket (3/8" slot on one side) two used on NH balers:



### Options

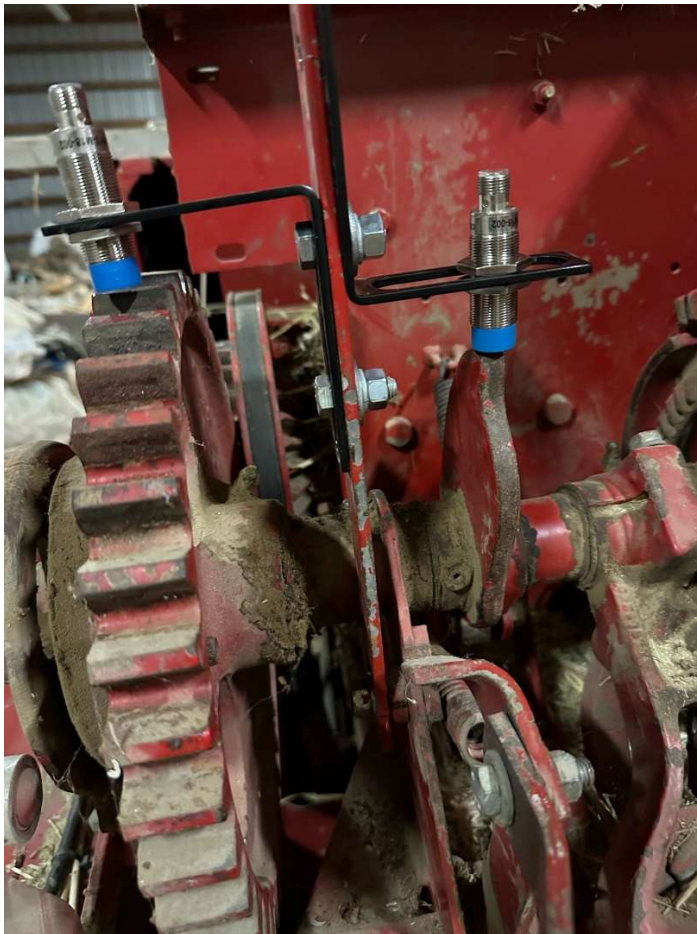
Moister Sensor Pads and wiring (single or dual):



GPS Ground Speed Sensor:



**Step 1: Mounting Count Sensor Brackets**



Overview photo of sensors mounted on NH baler.

Start by assembling sensors and L brackets. Make jam nuts finger tight.



Measure from top of knotter shaft support and mark cover support bracket at 2.5, and 4.5 Inches



Mark position of cover support. Take note of which way the top of the support is orientated as it may be different from these photos.

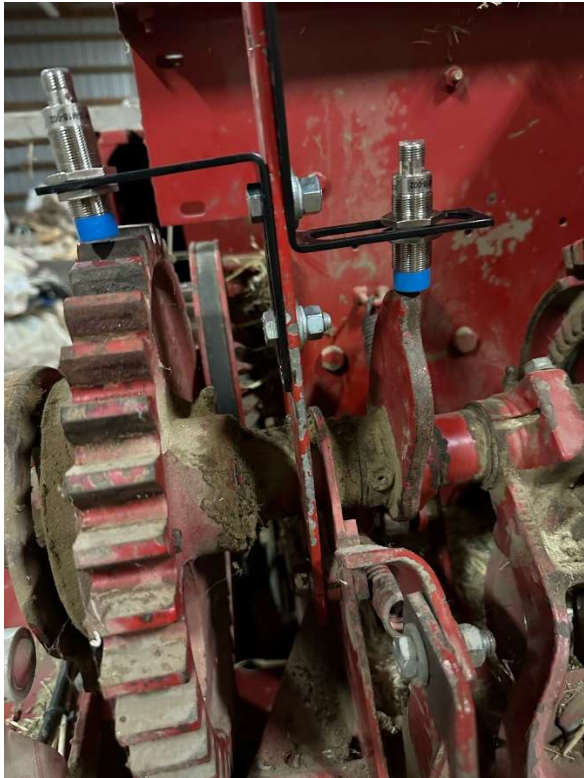


Remove cover support and center punch marks in the center of the support. Drill holes with pilot bits ending with a 25/64<sup>th</sup> drill bit.

Install cover support back in its original position.



Install brackets with two 3/8" X 1" bolts with washers and nuts. The top bolt holds both brackets and bottom bolt only holds stroke bracket. Tighten bolts with brackets in a position that allows the sensors to be close clearance and aligned with the gear and twine finger cam.



## Step 2: Adjust Sensors





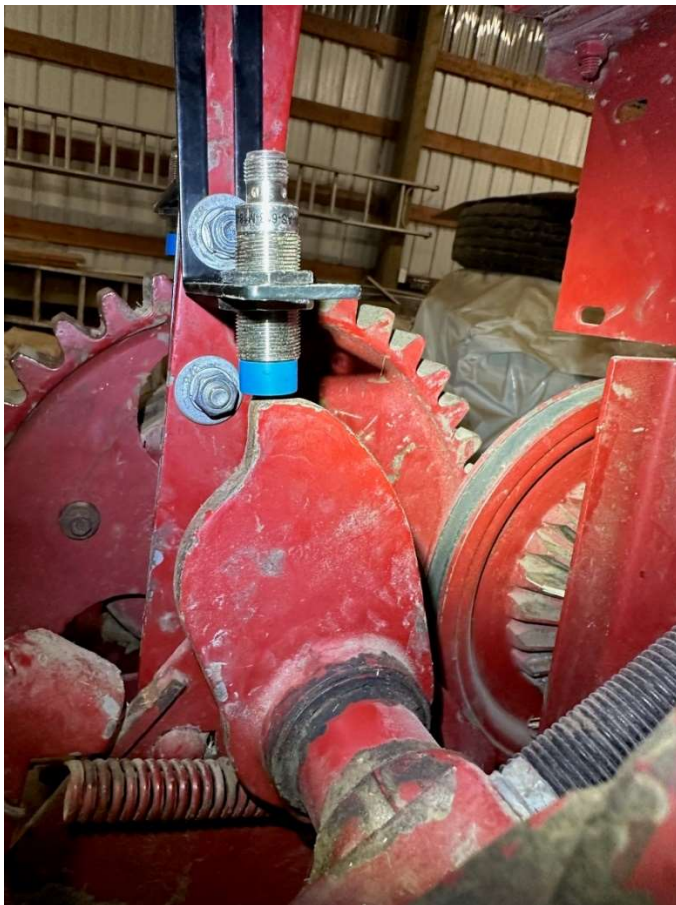
**S/N 65 and higher:** Adjust stroke count sensor (on the left side) to about ¼ inch clearance with idler sprocket teeth. After the system is connected to power the LED on the sensor will illuminate when a tooth is close to it and turn off when it's in between teeth. If the LED is on all the time with the baler running the sensor clearance is too small. If the LED is off all the time the clearance is too large.

**S/N 64 and lower:** Adjust stroke count sensor (on the left side) to about 1/8-inch clearance with idler sprocket teeth. If the stroke per minute number excessively jumps around or is unstable the sensor is too far away.

**Rotate the baler by hand to make sure the teeth do not rub the sensor.**

**Take note of the number of teeth on the knotter clutch gear. This number will need to be entered into the monitor during the program setup step. Tooth Count: \_\_\_\_\_**

Adjust bale count sensor (on the right side) to about ¼ inch clearance with twine finger cam. When the sensor is aligned with the cam the LED should be on all the time power on. If the LED is off with power on clearance is too large.



**Double check all hardware is tight before running the baler.**

### Step 3

Route Baler harness

Place count sensor wires under knotter drive gears.



Send wire under twine finger shaft as shown.



Connect stroke count wire to LH sensor and bale count wire to RH sensor. Zip tie wires in place.

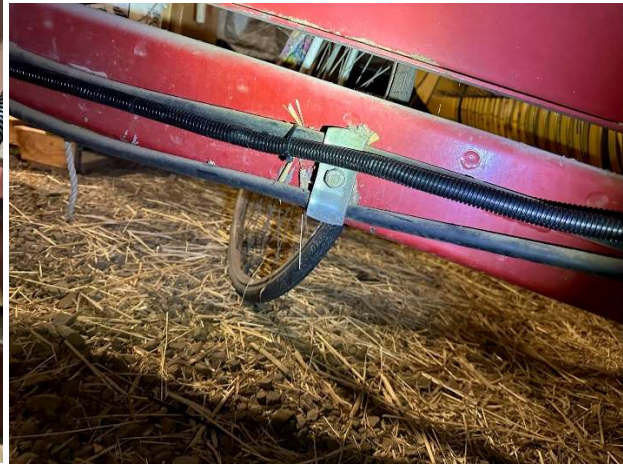




Zip tie excess small sensor wire back and forth on themselves and zip tie to other wiring near door.



Route main harness down to tongue and zip tie to swing cylinder and hoses if equipped. Attach to tongue if not equipped with hydraulic swing.



Place wire harness where it will not rub or catch on the PTO shafts and zip tie in place.



#### Step 4

Mount BPM-101 monitor with ram mount system in cab. Mount Ram Ball in a location that allows the arm to position the monitor where you want it. Ram mount ball can be mounted on a round tube or a flat surface.

#### Step 5

Connect cab harness to 3 pin tractor power outlet, place drawbar connector out the rear window. Connect the baler harness to cab harness at the hitch area.

#### Step 6

##### Install optional moisture sensors

Find a good location in the chamber as close to the end of plunger travel as possible but behind restrictor plates or wedges. Find the center of chamber height. Drill two  $\frac{25}{64}$ " holes 4 inches apart (3.5" if your pads were shipped before spring of 2021). Centered between those holes at 2" (1.75" if early pads) drill a  $\frac{1}{2}$ " to  $\frac{9}{16}$ " hole depending on what drill bits you have available.



If you are closer to  $\frac{1}{2}$ " push the ring terminals into the chamber (because the two-pin connector will not fit through the hole) and attach to two studs on separate stainless-steel bars on the pad.



Make sure all four 1/4" nuts are tight. Insert 3/8" flange head bolts into the pad, while holding the pad in one hand pull the wires back through the hole and push the 3/8" bolt through their holes. Secure with 3/8" flange nuts or nuts and washers. Connect the two-pin connector to the baler harness at LH or RH moisture.

Repeat for second sensor pad if needed. Go to step 8 to setup monitor for moisture sensors.

## Step 7

### Install optional GPS speed sensor

Find a location that provides a clear view of the sky, preferably the cab roof. Two small screws are included for mounting the sensor. If you do not want holes adhesive Velcro or something similar would be a good idea. Connect the cord to cab harness with 3-pin connector. Go to step 8 to setup monitor for GPS speed sensor.

## Step 8

### Monitor Set up Menu

Access menu by holding the shift button for 10 seconds: 0 Main Run Display, will display.

### 01 Setup Stroke Counter

Hold Shift and press the up arrow to page 1. While only holding shift: 1 Setup Stroke counter, will display.

Release shift and: Pluses/Stroke 50 will display. Use the up and down arrows to adjust to the number referred to in step 2. Some common balers are as follows:

New Holland Knotter clutch gear=39

**Be sure to verify your exact balers sprocket tooth count as it may be different than listed.**

After the number is set hold shift and press the up arrow to go to the next page.

### For GPS speed sensor go to page: 02 Calibrate Speed Sensor.

Release shift and Pluses/mile 16000 will display.

**For miles per hour:** set to 200,000 with arrow keys.

**For kilometers per hour:** set to 124,274 with arrow keys.

Hold shift and use arrows to go to the next page.

### For Moisture sensors go to page: 05 Setup Moisture Sensors

Release shift and use arrows to set the number of sensors to None, Left Only, Right Only, or Both.

### For Moisture sensor sensitivity go to page: 06 Setup Moisture Read Display

This sets how quickly the moisture feature displays changes in readings on the sensors. Options are Slow, Medium and Fast. Slow is default and recommended.

### To get back to main run page: 0 Main Run Page

Hold Shift and use the arrows to get to 0 Main run Page release shift and arrows and the display will show the run page.

## **Operating Monitor**

When the display is on the main run page the operator can use the arrow buttons to increase or decrease the backlight. This is helpful for changing from night or day baling. Default is 70 and can be changed in steps of ten from 0 to 100. Higher is better for daytime and lower numbers are better for night.

## **Resetting the Bale counter**

Hold the alt button and then press and hold the up arrow for five seconds to clear the bale count.

## **Using Moisture Sensor(s)**

The optional moisture sensors can measure from 6% to 30%. If moisture is below 6% or sensors not configured display reads: - - - until moisture becomes higher. If the reading is 30% or higher the crop is possibly much higher than what the display reads. This is because the monitor max reading varies from approximately 33-43% so it could be really 60% but the display will only read 33%. If the unit always reads more than 30% make sure wires are connected as described in step 6. When using both left and right sensors the display alternates from the left reading to the right reading every 3 seconds and shows an L or a R next to the number displayed.

## **Using the Flake counter**

Knowing the bale flake count allows an operator to have a flake count target, if the target number is not correct the operator can adjust his speed accordingly. Higher flake count means the ground speed is too low, low flake count means too fast. When the ground speed of the baler is adjusted to maintain the same flake count per bale despite the hay yield (tonnage/thickness) changes in the field, the bale weight and length of each bale are consistently close to each other. This is because hay flakes of different sizes compress at different rates, small flakes compress tighter and large flakes want to spring apart. By keeping the same sized flakes, the knotter can tie at the same length and the amount of hay being compressed stays the same leading to consistent bale weight.

If you don't have a flake count target in mind an easy way to determine one is to pick a flake size of 2-4 inches and divide your bale length by the flake size. Example: 36-inch bale length/ 3-inch flake size=12 flakes per bale another example is: 45/3=15. The target doesn't have to be exactly what was calculated but within 1-2 flakes is good.

Another benefit of using flake counters is it helps keep balers more productive. This is accomplished by keeping the flakes per bale the same even though the tonnage per acre changes. If the field is producing 2-ton per acre in one area but only 1 ton in another you can double your ground speed in the 1-ton area to keep your flake count the same and your tons per hour the same and double your acres per hour. By not overfeeding the baler you can also increase your productivity by not braking twine or knots. When hay is overfed into the baler it can cause the twine to come out of the twine holder making the knotter mistie. Or if the bales are too springy from overfeeding for conditions it can cause tension breaks in the twine. Bales of



low flake count tend to be soft and loose, making for poor stacking. The less bales you have to re-bale or the less times you must unplug your baler the more productive you will be. Flake counters are a great tool for new baler operators and experienced operators like the convenience of not counting manually.

As the monitor displays the flake count of the current bale being made; the count increases each time the plunger strokes. When the knotters tie the bale, the final number is shifted to the right allowing you to see the previous bale's count while the current count increases for the new bale being made. The previous bale counts are displayed for the last four complete bales, this feature is for seeing if the flake count is trending up or down to know if ground speed adjustments are needed. This prevents you from having to watch for each flake count to display and then keep mental notes of the last few bales.

When baling it's important to not react every time the flake count is not on target, if it's slightly different don't change anything for two or three bales and just watch to see if it's consistently going up or down. If you get a few bales with that are 2-3 flakes off target change your ground speed to correct it. If the flake count is flipping back and forth from too many or too few by only 1-2 flakes you can keep it right where it is. If it bounces up and down 3-4 flakes or more slow down to keep the target number about the max number (it's better to go a little slower than too fast). After making a ground speed adjustment don't make another adjustment till you have made at least one bale without the speed changing in the middle of the bale being made (if the count is way too high and the bale hasn't tied yet go ahead and speed up). Take note of the windrow size/appearance and try to correlate it with the flake count, sometimes windrows are deceiving, but try use it to anticipate the flake count changing and adjust speed as needed.

While baling take note of your ground speed and windrow size/appearance when the target flake count is achieved. You can do this with your tractors display or with the optional GPS speed sensor connected to the monitor. Use this info to change ground speed when conditions change and to get back to the same speed when making headland turns.

For most baling you will want to keep your baler at max PTO speed and adjust the transmission to get the correct flake count or as close as you can. If your crop becomes very low tons per acre, you can slow the PTO speed down and shift into a higher gear to reach the target or get as close to the target as possible. Don't operate the baler at less than 75% of the rated PTO speed for light windrows, doing so can cause problems with the balers hydraulic tension pump and make the bales loose. Balers rated at 100 SPM would be 75 SPM with a 25% reduction. Balers rated at 80 SPM would be 60 SPM.

The monitor also displays the strokes per minute rate of the plunger this is useful to know if the tractor PTO speed is correct, and to make sure the slip clutch is not slipping too much. It can be used to operate a baler (or fleet of balers) at reduced speeds in light crops when the flake count is way too high. It's handy for checking the efficacy/settings of engine or hydro drive (commonly found on 3-tie) balers.

The flake counter also can keep count of your total bale count and can be reset at any time. So, if you want to keep track of totals for a field, the day or the season you can use it how you see fit.