Inline Planer Meter MC Pro 2500
Complete Installation Guide

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Introduction

The Finna Sensors In-line Planer Meter; The MC Pro 2500 Installation Manual is designed to assist first time users with the planning, installation and testing of their system.

Contents of Shipment

| System Components	Options and Spares
- Main Control Unit (MCU) Cabinet - Sensor Head Unit 50' x Sensor Cable ¼" Mounting Plate 4 x Mounting Bolt (1"x⅜") 4 x Mounting Nut (1") 4 x Adjustment Bolt (1"x6") 4 x Lock Washer (⅜") 4 x Flat Washer (⅜") 1-⅞" x 2-⅝" Calibration Piece - User Manual	10 Gallon Paint Tank - Paint Spray Gun & Valve 50' x Air Line for Painter (⅛") - Air Coupler & Plug - C Junction Box - Push Lock Fitting "T" 2 x Butt Splice - Kiln Tally System (Keypad) 100' x 2 Pair Cable - Spare Parts. Including: - Opto22 Interface Card - Opto22 Output Module - Opto22 Input Module - Displacement Sensor - MC Sensor Digital Pulse PCBA - Power Supply - Infeed Photoeye - Controller Card 4 Channel A to D Card - Rabbit Card - Adjustable 250mm Sensor - Serial Display - Ribbon Cable - Temperature Sensor

MCU Installation

- Choose a convenient location just outside the planer room.
- Be sure the MCU is protected from lumber and excessive vibration.
- MCU should be within a 50-foot cable run of the meter.
- Run ¾" conduit from the MCU to the location of the meter.
- Run Cat5 communication cable from the MCU to the location of the reporting computer, or to the network router you wish to have the Moisture Meter on (300 ft max).
- If using a painter, run min 16AWG Teck cable to painter junction box from the MCU.
- If a keypad was purchased, run conduit to location of keypad at the tilt hoist.

- Run communications cable to PLC or grading machine (12 Conductor if Discreet I/O, 2 Pair if Serial).
- Supply 110-volt clean power.
- Run wires for alarms. Two 14AWG wires to PLC, or one to location of an alarm light.

Mounting Keypad (If Purchased)

- Mount the keypad in a convenient location near the tilt hoist operator.
- Be sure that the enclosure is free from excessive vibration.
- The keypad must be within 300 ft of the MCU enclosure.
- Run 3/8 conduit from the keypad to the MCU enclosure.
- Pull the supplied 2 pair cable from the MCU to the Keypad.
- Wire the keypad as per the wiring diagram inside the door of the cabinet.
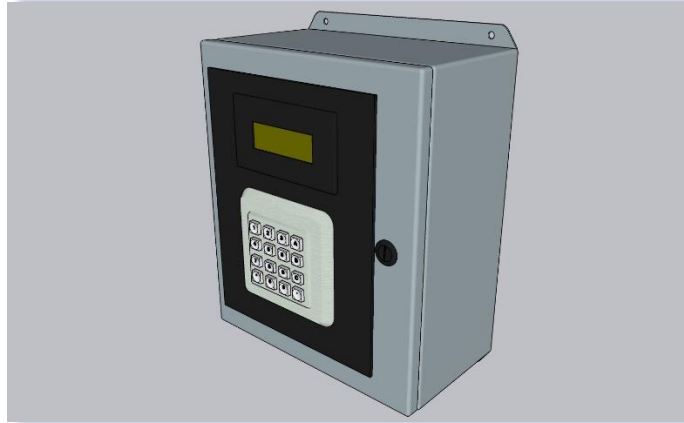
To accurately rebuild the bundles in the Finna kiln charge tracking, it may be necessary to install a remote enter button at the planer infeed:

- You can use any momentary switch.
- Place the button in a convenient location for the planer feeder.
- Run any two-conductor cable from the MCU to the remote enter button.
- Connect the cable in the MCU, as represented on the diagram on the inside door of the MCU. One side of the button will be hooked up to +12V and the other side will feed the button signal to Opto22 input #4.

Painter Installation (If Purchased)

- Install the paint gun in a protected location 6 – 12" above the lumber and at least 8' downstream from the out-feed of the moisture meter.
- Mount the gun on ½" shaft or redi rod which extends across the out-feed belt.
- Mount a small junction box within 20" of the paint gun.
- Mount the Paint tank at a convenient location within 15' of the painter junction box.
- Run 16AWG teck cable from MCU to the painter junction box.
- Run supplied paint and air lines from tank out to paint gun. The paint line goes to the front of the gun, and the air line to the back.
- Supply mill air to paint tank.
- Wire the painter as per wiring diagram inside the MCU enclosure.

Installing Moisture Meter

Choosing a Location

Choose a location either on the out-feed of the planer or grading machine with the following in mind:

- It is recommended to install after the grading machine due to minimal board movement.
- The unit must be guarded from direct impact with lumber. It is recommended you build a special guard to accomplish this. Finna Sensors can provide examples.
- Mount the system close coupled to the planer or grading machine to limit the amount of lumber movement. A guide or roller may minimize the vertical movement of the boards.
- Secure the mounting plate such that there is as little vibration or movement as possible.
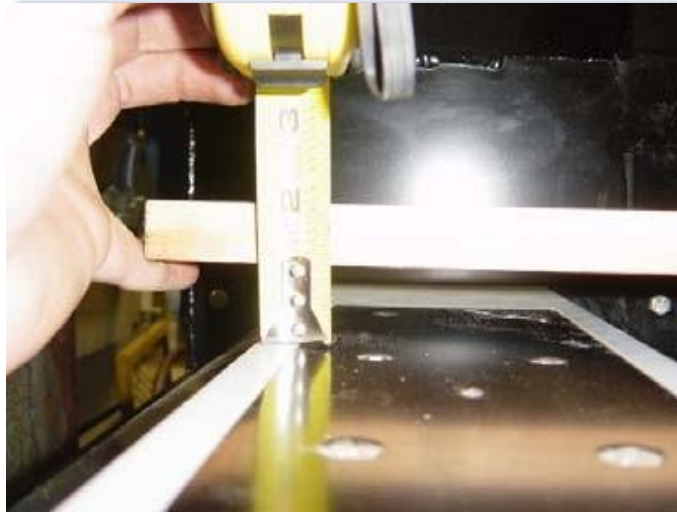
**Building a Stand for the Mounting Plate**

The mounting plate will be installed with the 1" screw jacks. Be sure to leave roughly 1" of thread showing on top of the mounting plate to allow for leveling and fine adjustments.

Keep in mind that the bottom of the lumber must be 1" from the bottom sensing plate.

The mounting plate must be square to the lumber line and the lumber line must be exactly 9" from the very back of the sensor head.
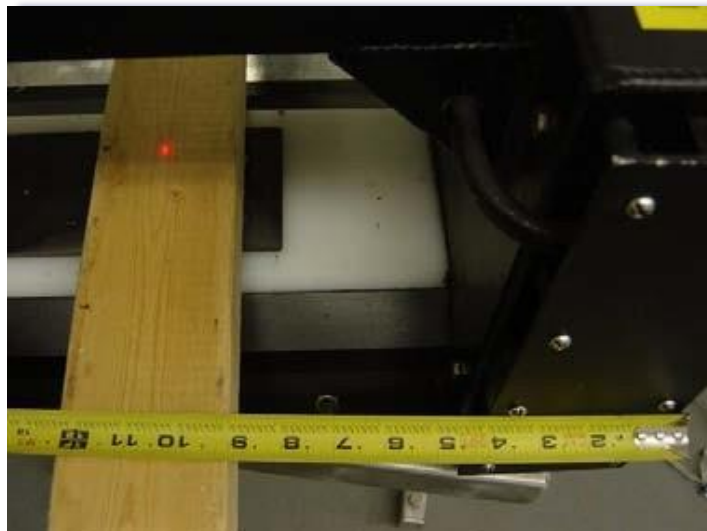
Guarding the Sensor

- Once you have built your stand to mount the sensor head it is time to build a guard for the sensor.
- We recommend building a steel "funnel" that can withstand a direct hit from a stray board, that will re-direct the wood to the middle of the sensor head.
- Below is an example of what we would like to see. You will notice that a board traveling up, down or side to side, will be re-directed by an angled piece of steel, to the middle of the sensor.

Mounting the Sensor

- Now that the stand is built and the guard is in place, it is time to bolt the sensor down and verify measurements (9" from back plate and 1" off base plate).
- The unit gets bolted down using 3/8" bolts, flat washers, and lock washers.


- Check the unit for level, both front to back, and side to side. If unit is not level, use the screw jacks to accomplish this, keeping in mind that the lumber must travel 1" above the bottom sensor plate.

Photo Eye Set-Up

Programming Infeed Photo Eye

1) Press and hold the button for 2 seconds until the amber light flashes slowly.

2) Place a board in front of the photoeye, about ¾ of the length down the system. The laser of should be in the center of the board.

3) Press the photoeye button and the amber light will flash.

4) Remove the board and press the button again. A green light will flash confirming the photoeye is programmed.

5) Move the board in and out of the photoeye sight and confirm the amber light illuminates when seeing the piece, no further than ¾ of the way down the system. If not satisfied with the range of the photoeye vision, reprogram using the steps above.
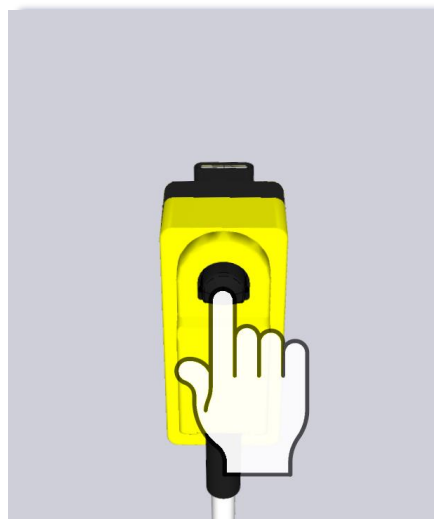
Aligning and Adjusting Main Photo Eye

1) Place full size lumber in sensor, at both the height and distance it will sit while running.

2) Adjust main photo eye up and down until it is seeing about ¾" into the top side of the piece.

3) If needed, adjust sensitivity using black adjustment screw on top of photo eye. Photo eye should see piece when it is sitting right on bottom plate, but not see anything when there is no wood in the system.
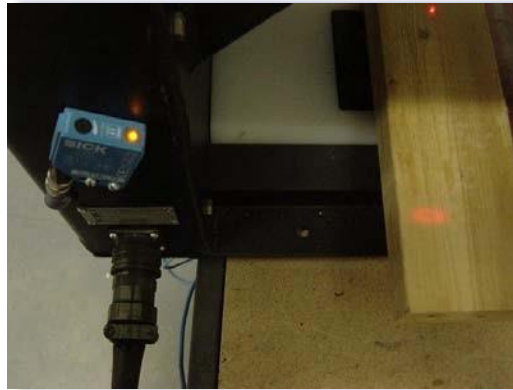
4)   When the photo eye is in desired location, drill a 7/64" hole in the second (slotted) mounting hole.

5) Tap the hole with a 6-32 tap.

6) Install a second screw to hold the photo eye in position, using Red Loctite to hold the screw in place.

Calibrating the Distance Sensor

1) Using the LCD display in the MCU, press "Mode" until you see "Distance Cal".

2) Press "Select" to activate.

3) Place the calibration piece so obstructing the laser so that the concave face is facing down. (1.875)

4) Press "Select" on the LCD screen to continue.

5) Flip the calibration piece on its side so that it rests on one of the smaller faces. (2.625)
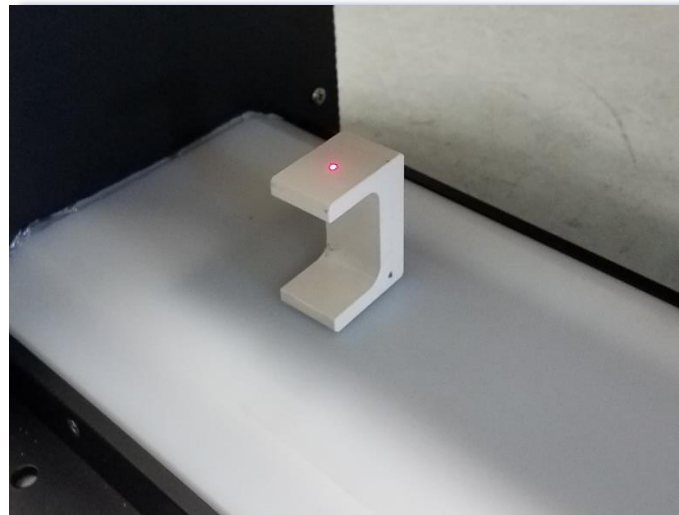
6) Press "Select" on the LCD screen to finish.

7) Calibration numbers should be close to factor = -10200, offset = -4200. If so press "Select" to accept.

Alarm Setup

The alarms can be setup several different ways. The nicest way to do it is to run the alarm outputs into your PLC and display them on an LED display panel (customer supplied). You can also run the alarm outputs to a light that will light up when there is an alarm on the moisture meter.

Alarm to PLC

- Run two 14AWG wires from the MCU to the desired PLC inputs.
- Connect the MCU side of the wires to the alarm outputs, which are labeled on the diagram on the inside of the MCU door.
- Program PLC so that the Inline's system alarm is active low (Signal goes low when alarm is turned on) and photo eye alarm is active high (Signal goes high when alarm is turned on).

Alarm to Light

- Since the alarms run opposite polarity, you can either choose to run two separate lights, or you can hook up a relay that will turn on an output to a single light.
- Run two 14AWG wires from the alarm outputs, labeled on the inside of the MCU door, to the relay.
- Run one wire from the relay to your alarm light. Select the gauge of wire that will run your alarm light.

Connecting to Automatic Grader

Serial

- Run a 22AWG two pair cable from the MCU, to the auto grader.
- Connect the cable in the MCU to the Inline's serial 5 port (also displayed on the diagram on the inside of the MCU door).
- Connect the cable to the serial card of your auto grader.
- Once the Inline is powered up and ready to run, you will have to select which mode your auto grader needs. The different modes output the following:
    - Full Mode: Every MC reading, Bundle number, Average reading, Peak reading, and which readings were deleted in our algorithm.
    - Peak/Average Mode: Peak MC reading, Average MC reading.
    - Peak/Average/Bundle Mode: Peak MC reading, Average MC reading, Bundle number.

Discreet I/O

- Run 7 wires from the MCU to the auto grader's I/O card.
- 6 wires will be the reading bits, 1 wire will be the toggle bit, telling the grader when to watch for a new reading.
- Connect the wires as labeled on the diagram on the inside of the MCU door. Decide which output will work for you (Average, Peak, Every Reading).
  - Average: Outputs only the average MC of that board.
  - Peak: Outputs the peak MC reading of that board.
  - Every Reading: Outputs every MC reading the 2500T took on that board.

IP Configuration

- If you are running the MCU on your network, you will have to set the IP address of the controller.
- On the MCU press Mode until you see "View Net Info" and press Select.
- Press Select again to get into the set IP screen.
- Use the Select button to change the number and the Mode button to move to the next number.
- To store the new IP press Mode until you are all the way past the subnet mask, and it will ask you if you want to save it. Press Mode to save.
- Press the reset button on the controller board inside the cabinet.
- Move the ethernet cable back to the controller board.
- Open the windows reporting software.
- It will say connecting to controller until it times out and says error connecting to controller. This is because your pointer is still set to our default IP address.
- Click OK.
- Click system setup.
- Click setup controller network information.
- Set the top IP address to the IP you just set.
- Click OK.
- Close the software and re-open it.
- It should now say connected to controller.

Testing Components

The following steps should take place inside the Inline software installed on a PC connected to the controller via network:

- In the main menu, open the "**Tools**" tab and click the "**Static Test**" option under the Diagnostics category.
- Click Yes.
- Test Backgrounds.
    - With nothing in the system watch the delta in the left of the screen. It should be close to zero (+/-2).
    - Click the Force Background button in the bottom right of the screen.
    - You should notice the delta jump up and then quickly settle very close to zero. The moisture reading will sit at our minimum of 6%.
- Test Photo Eyes.
    - Have someone block both photo eyes while you watch the static screen and verify that they are changing.
- Test Moisture/Temperature/Distance Sensors.
    - Have someone put their hand under the distance sensor and move it up and down.
    - Watch the temperature change as they put their hand in place.
    - Watch the moisture move up and down.
    - Watch the distance reading go up and down.
- Verify Meter is Reading.
    - Exit the Static Test.
    - Open the "**Live Data**" tab and click on the "**Monitor**" option.
    - Block the main photo eye and unblock it and verify that it ran a piece.