

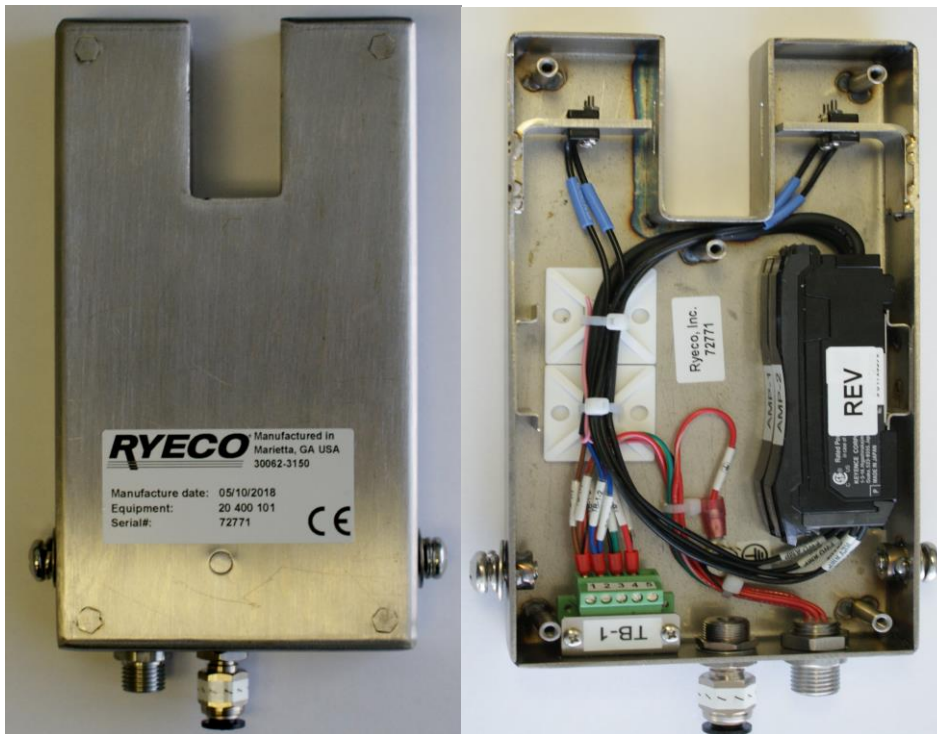
SECTION 3.24 Infrared Edge Tracking Module (ETM-1100™)

Overview

What is its function?

- This module always ensures that the RYECO System is located on the material's sheet edge.
 - It does this by utilizing two syncing amplifiers, one for forward sensing and the other for reverse sensing, that ensure the web edge is always located between the two sensors. As the web wanders, the affected amplifier provides a PNP signal to the system's PLC, which will drive the actuator in the appropriate direction until the web edge is located between the two sensors again. This routine is active as long as the "System Acquire Web Edge" input is high.

What does it look like?



External View

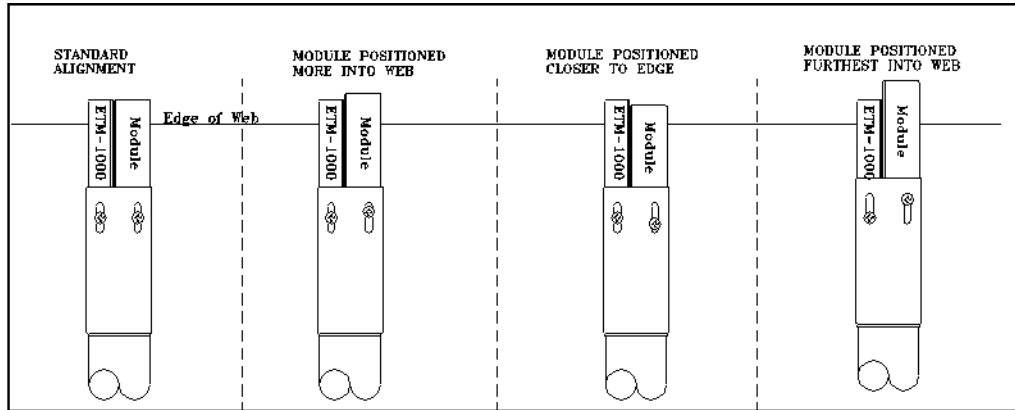
Internal View

- The modules dimensional size is 7" x 4" x 1" (L x W x D).
- The housing and lid are made from stainless steel (SS) material.
- It's commonly secured to a transition box utilizing a pair of 1/4-20 stainless steel (SS) screws that come with the module.
- It utilizes an air purge design that keeps the internal components of the module cool and dust and debris away from the inside of the module and optics.
- Air Purge pressure for the ETM is 20-30 PSI (25 PSI Typical) or 1.379-2.068 bar (1.723 bar Typical) These values can be raised or lowered depending on the environment of the installation.

Operation

What are the operational variables?

- The position of the Edge Tracking Module, with respect to other module(s) in the transition box, can be changed. See examples below.



Module Alignment Examples

Why would I change the operational variables?

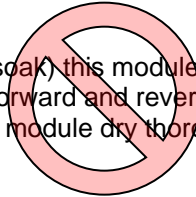
- Changing the alignment of the Edge Tracking Module in the transition box allows the other module(s) to function at different locations in the cross direction on the sheet edge.

How can I check its operation?

- While the RYECO System is in full automatic operational mode and tracking the sheet edge, place the actuator control box AUTO/MANUAL switch in the MANUAL position. Hold the actuator control box FWD/REV switch in the REV position and move the tracking module away from the sheet edge (**Do not move the system in reverse all the way to the home position**). After moving the tracking module away from the sheet edge release the FWD/REV switch and the system will stop at that position. Place the AUTO/MANUAL switch back into AUTO mode and the tracking module will attempt to reacquire the sheet edge.
- An alternative method for checking operation is as follows:
 - With the actuator station control box placed in automatic mode and the "System Acquire Web Edge" signal received, the RYECO System will attempt to move forward after the initial prime dye routine is complete. Once the system is moving forward, the operator can insert a piece of paper in the jaw of the tracking module and move it back and forth to simulate paper wander. The tracking module should follow the back and forth simulation.
- While the tracking module is away from the sheet edge ensure the air purge is operating properly by placing your hand over the optical ports. You should feel air flow coming out of the ports.
- While installed in an extension tube, connect the extension tube to a RYECO Marker Test Station. Use a piece of paper in the ETM jaws to check that both sensors are working correctly using the two LEDs on the Marker Test Station door.

Maintenance

- Before moving forward in the maintenance section please note the following information:
 - Do not immerse (soak) this module in any type of liquid.
 - Do not clean the forward and reverse amplifiers/optics with solvents.
 - After cleaning this module dry thoroughly before applying power.



How do I check its' function?

- The module produces outputs that can be checked in the following manner.
 - With 24 vdc applied to the five-pin molded cable (24 vdc at position 1, 0 vdc at position 2), the technician can check the signals with a digital meter and a sample sheet to simulate the web.
 - The FORWARD SENSE signal is on pin 3 and the REVERSE SENSE Signal is on pin 4.
- The technician can also check the condition of the output status via the red LED on the amplifier face.
 - FWD amplifier should be outputting when no sample is in the jaw and REV amplifier should not be outputting.
 - REV amplifier should be outputting when a sample is placed in the jaw and FWD amplifier should not be outputting.
- For modules interfaced to a **RYECO** Operator Station, the outputs can be seen on the mini-controller input section.
 - They will be seen as FORWARD SENSE and REVERSE SENSE.
 - With the system in off-sheet mode, you can insert a piece of paper all the way in the jaws and observe the mini-controller LEDs reversing condition.

What periodic maintenance is needed?

- Periodically wipe debris from the apertures in the module jaw. If the module has been operated without air for a period of time, the module interior and optics may need cleaning.
- If oil or drying agents (desiccant) have been introduced into the air system, the module may need cleaning.

What setup changes and adjustments can I make?

- You can adjust the position of the module in the transition box to control the marker location in respect to the edge of the web. (Marking on the sheet more or on the sheet less)
- The ETM is adjusted with the module off-sheet and connected to the electrical fitting.
- The ETM needs to be removed from the actuator via the 1/4x20 S/S screw on the top of the module and the lid opened (via five Phillips head 6-32 screws) for access to the photo-amplifier sensors.

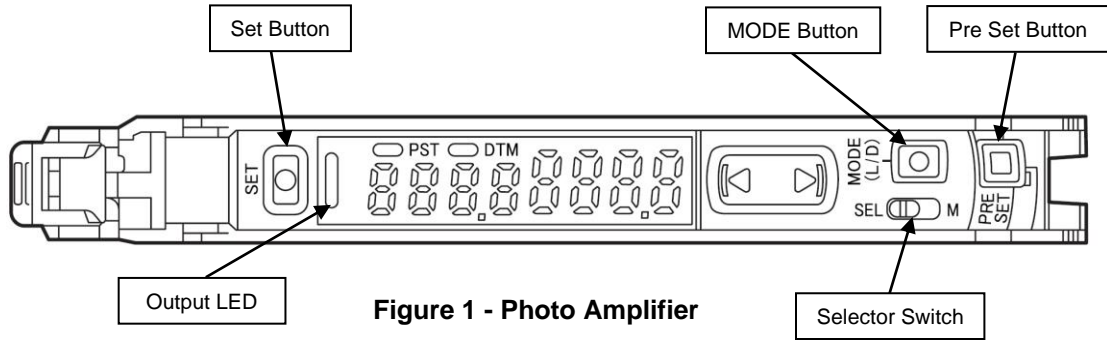


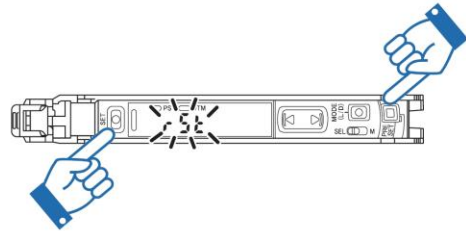
Figure 1 - Photo Amplifier

Factory Amplifier Setup

1. Reset Both Amplifiers

Press and hold the [SET] and [PRE-SET] buttons simultaneously for 3 seconds or more.

The "rSt" display flashes.



Press the [MODE] button.

Press the  button to display "in it".





Press the [MODE] button.

After the settings are initialized, the screen displays "oL", which is then replaced with the current received light intensity.



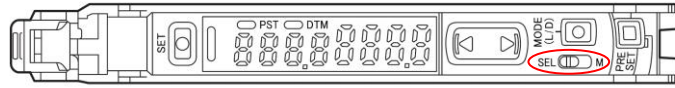
Note: It may be necessary to unlock the amplifier to perform this step.

Press and hold the [MODE] button and  (or ) simultaneously for 3 seconds or more.

The screen displays "unL", enabling key operation.



2. Ensure the Selector Switch is Set to the “SEL” Position



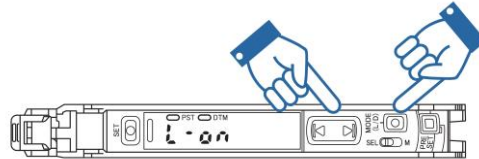
3. Set the Reverse Amplifier to “D-ON” (Dark-On) Mode

- Press the “L/D ON” button
- Use the “←→” button to select “d-on” on the display



4. Ensure that the Forward Amplifier is in “L-ON” (Light-On) mode

- If not, follow the previous step to set the amplifier to “L-on” mode





5. Amplifier Configuration (Applies to Both Amplifiers)

Step:	Navigate	Start Display	Final Display:
A	Press and hold the MODE <input type="checkbox"/> button for 3 seconds or more		Confirm Display
B	Press the MODE <input type="checkbox"/> button		Press to display
C	Press the MODE <input type="checkbox"/> button		Press to display "-70P"
D	Press the MODE <input type="checkbox"/> button		Confirm Display
E	Press the MODE <input type="checkbox"/> button		After 3 seconds the amplifier will return to normal use.
F	Press the PRESET button	The display values will shift from a 0-4095 scale to a 0-100 scale and the green PST LED will illuminate.	
G	Press the SET button	The green threshold value will change from 50 to 30.	

4. Lock Both Amplifiers

The key lock function disables all key operation to prevent unauthorized use.

Activating key lock

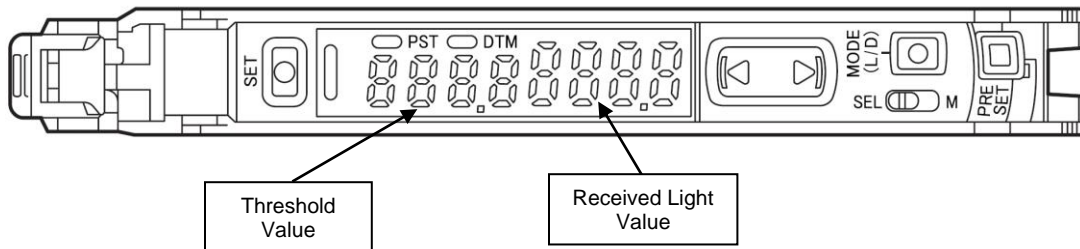
Press and hold the [MODE] button and  (or ) simultaneously for 3 seconds or more.

The screen displays "Loc", disabling key operation and displaying the current received light intensity.



Teaching/Testing the ETM

The ETM's amplifiers have been configured to automatically set the output threshold 70 percent below the received light value (value displayed in red) when the **SET** button is pushed. The threshold value will be displayed in green and should be 30 when the optics are clean and there is no paper in the ETM jaws.



1. Open the amplifier dust cover with a small screwdriver.
2. Press the "SET" button on the amplifier once. The display will blink "set" once then the calculated threshold (green value) will display.
3. Place the thinnest/lightest grade of material in the jaws of the tracking module. The sample must block enough light to lower the received light value (red value) below the calculated threshold value (green value) in order for the amplifier to output. The output LED should change from OFF to ON for the REV amplifier and from ON to OFF for the FWD amplifier.

If the sample does not block more light than the calculated threshold, try decreasing the percent value (default -70P) to a lower value (-50 to -30P).

How do I replace the subassembly?

- The Edge Tracking Module is replaced by removing the 1/4-20 SS screw from the top of the actuator transition box.
- Slide out the Edge Tracking Module from the front of the transition box in order to release the two connections on the back of the module.
- Disconnect the electrical connection by unscrewing the cable from the back of the ETM.
- The air supply tube can be removed from the fitting by pressing in on the green ring and releasing the tubing.

Specifications

Operating Temperature	150°F Max
Operating Humidity	35%-85% RH
Size	7.0"X4.0"X1.0" (178mm X 102mm X 25mm)
Signal Output	24V 100mA
Sensor Type	Infrared
Construction	316L Stainless Steel

Drawings

- ETM Internal Wiring
- ETM Internal Tubing