Revisions

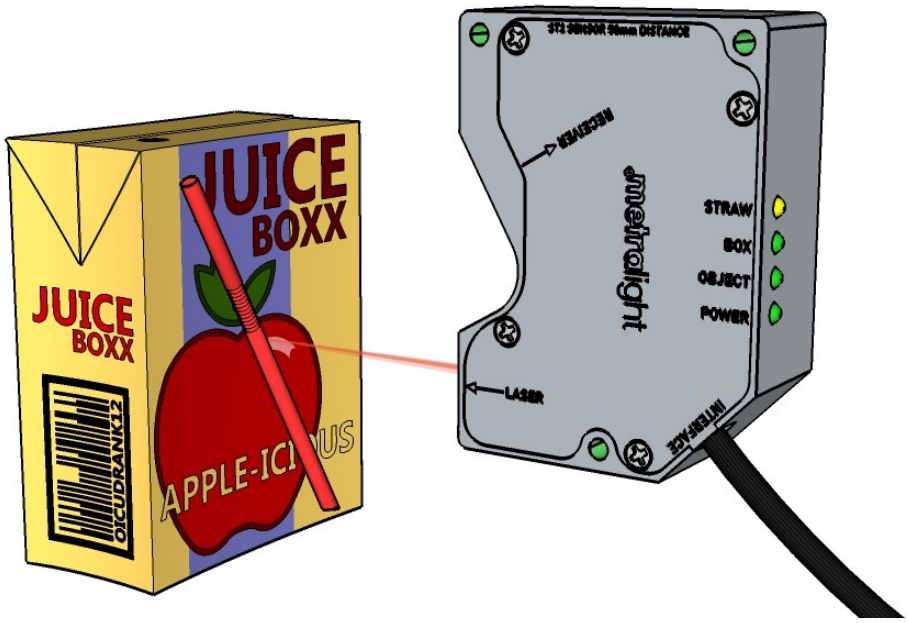
Revision	Date	Description
#1	July 2012	first revision
#2	November 2014	#STRAW signal timing change (reset to default state at begin of next box, see page 6)

Introduction

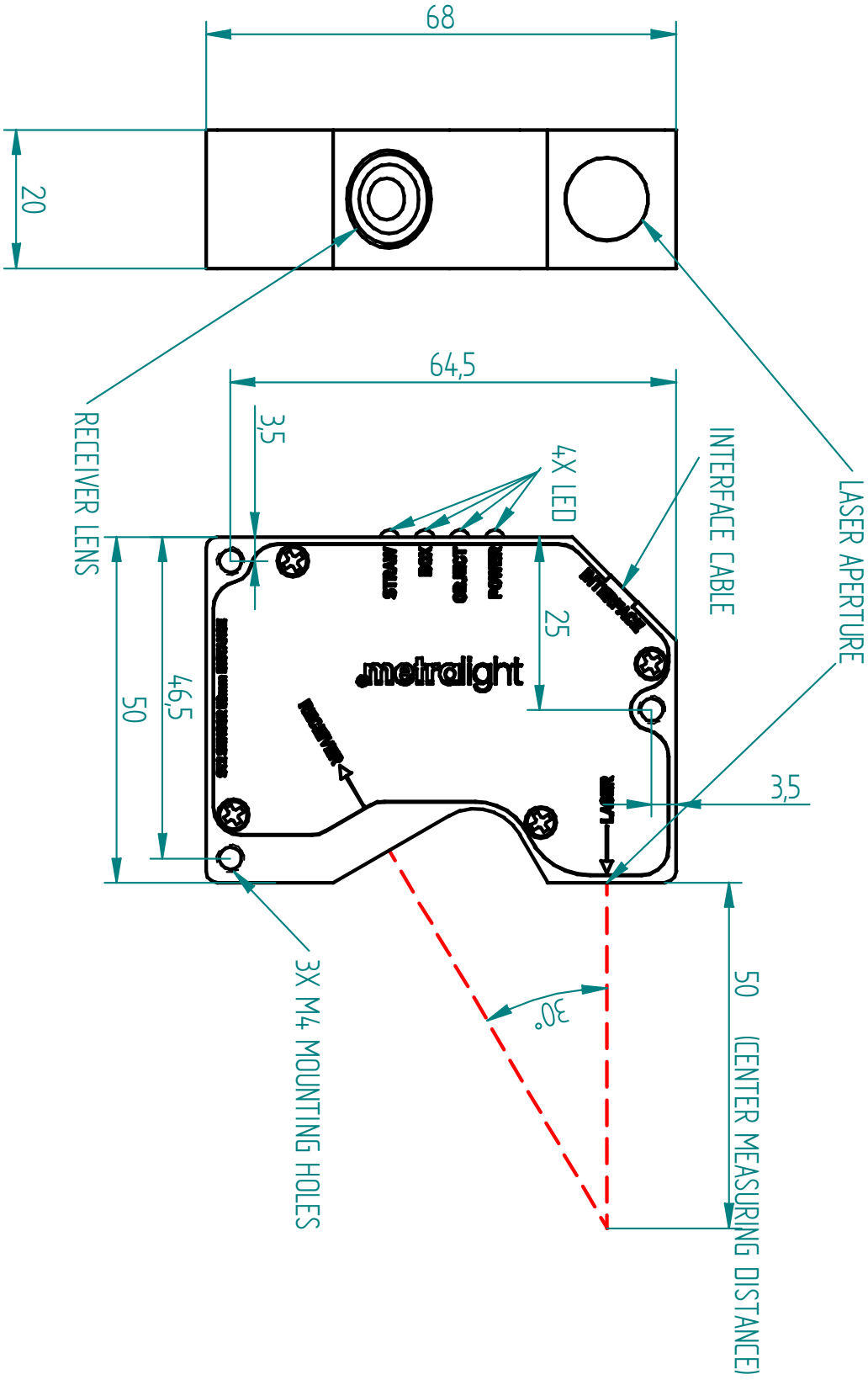
ST2 Sensor is primary designed for detection of straw presence on TETRAPAK and other packages. It's non contact optical device working on triangulation principle.

Features

Compact size	All processing done inside	Easy integration with PLC (Binary outputs)
Measurement Range: 50 ± 10mm	Detect Box & Straw presence	Fast 10.000 measurements/s
Optional RS232 output	Visible Laser diode 670nm (Class II)	Robust aluminum body



2. DIMENSIONS



For detailed dimensions, please download 2D drawing or 3D model from http://www.metralight.com or email at: info@metralight.com

3. SPECIFICATION

Measurement

Sensor Range	50mm ± 10mm
Measurement speed	10 kHz
Power supply	10-24VDC / 80mA
Output (1)	BOX green. Logical “0” (0V), Logical “1” (PWR), pigtail
Output (2)	STRAW yellow. Logical “0” (0V), Logical “1” (PWR), pigtail
Box moving speed	1 box/second to 30 boxes/second *
Indicators	3x Green LED (Power, Object, Box), 1x Yellow LED (Straw)
Detection Method	Laser (visible red 670nm Class II) point triangulation
Overall Dimension	68 x 50 x 20mm
Mounting holes	3x M4 Thruhole
Weight	150g
Operating Temp.	0°C to 50°C (32°F to 122°F)
Storage Temp.	-20°C to 70°C (-4°F to 158°F)

* Assuming box width 50-70mm with spacing between individual boxes at minimum 30mm.

4. OPERATIONAL

ST2 Laser sensor is intended to be used on moving production line to find presence of straw on tetra-pak or similar beverage packages.
ST2 sensor uses a point triangulation. ST2 sensor uses internal intelligent processing to find the presence of a straw. ST2 sensor automatically adapts on different conditions. Different colors, reflectivity and low to high speed of movement are no obstacles for reliable detection.
ST2 sensor has two outputs. BOX output is set when first edge of box occurs. STRAW output is set/ reset after end of box is detected.

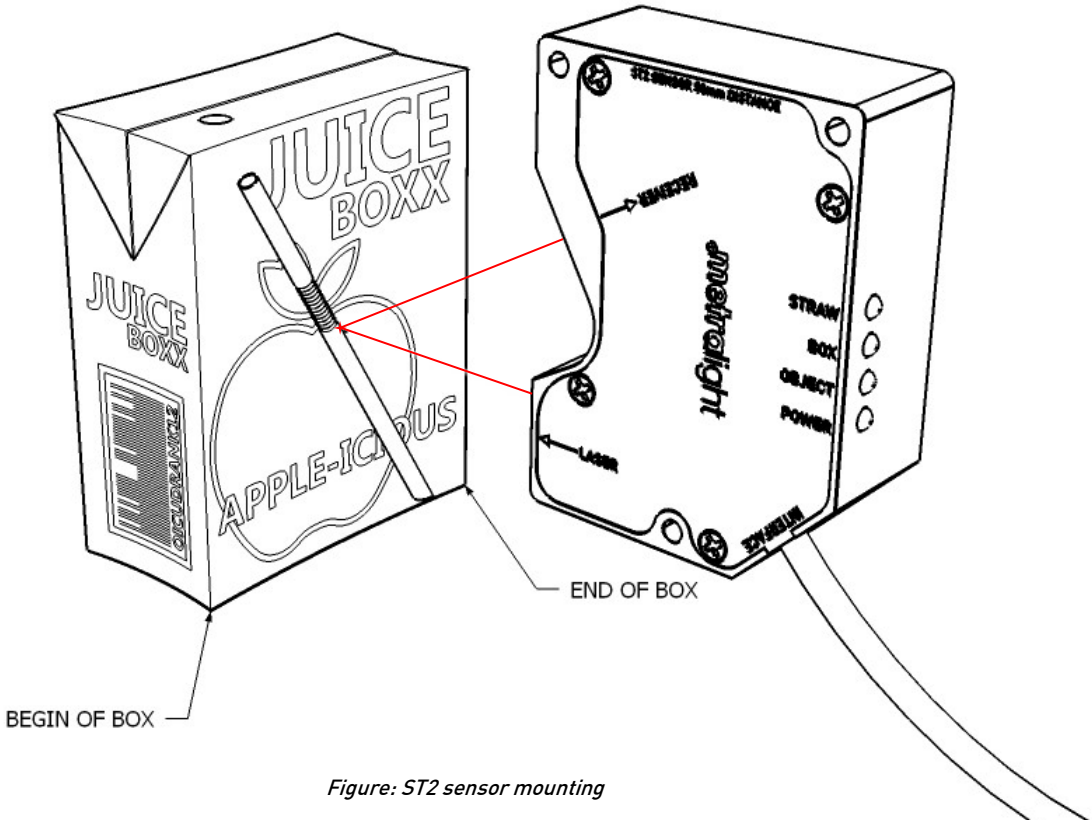


Figure: ST2 sensor mounting

Mounting

For best results sensor should be mounted as on Figure. Orientation of sensor is important for best performance. Distance between sensor front face and box face with straw should be 50mm. For sensor mounting use M4 mounting threaded holes on sensor.

Internal output circuit

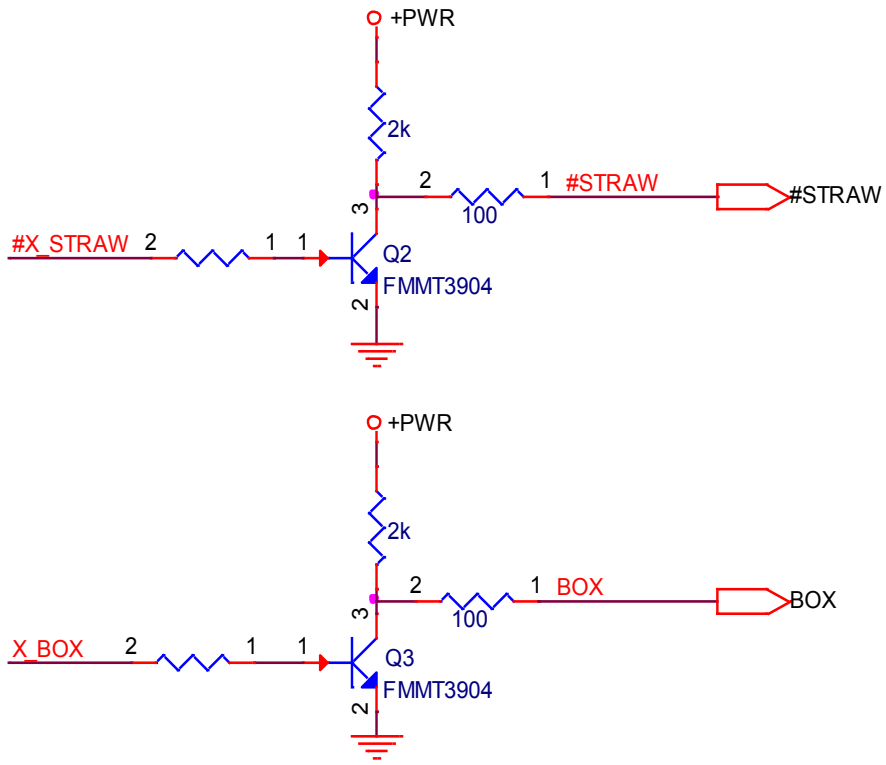


Figure: Internal output circuit

There are 2 binary outputs: BOX and #STRAW.
BOX signal is set whenever box is present in detection range (see timing chart).

Determination of straw on the box is quite different. The algorithm in ST2 sensor waits for end of box and then #STRAW signal is set accordingly (if straw was present then 0V is set otherwise +PWR). In other words #STRAW signal is always updated on end of the box.

Cable pigtail

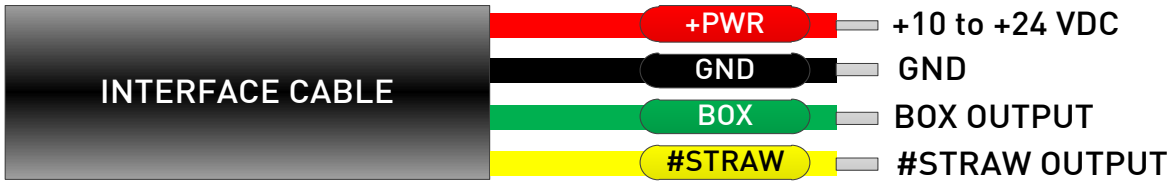
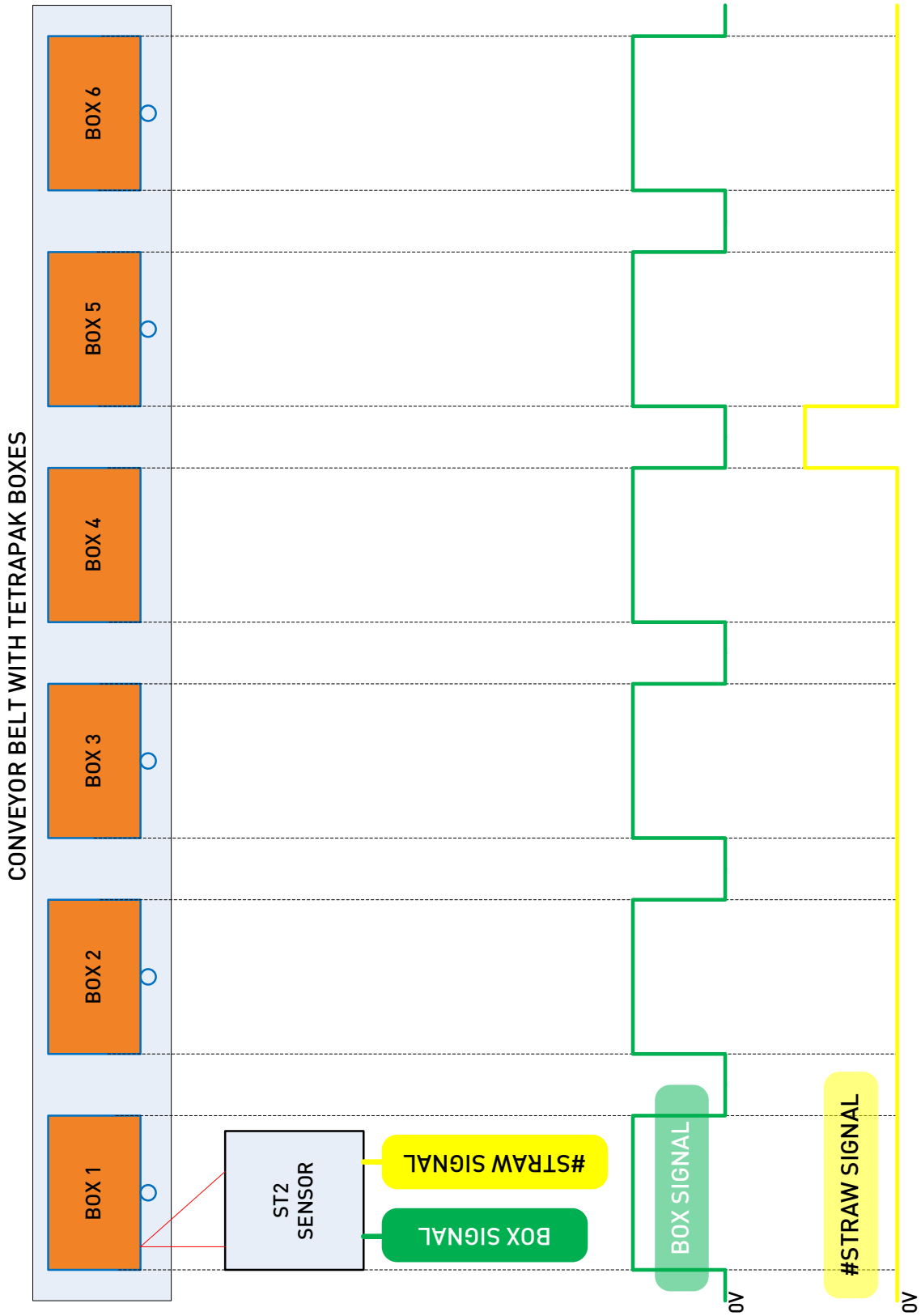


Figure: Sensor interface pigtail

6. SIGNALS DESCRIPTION



| USE APPROPRIATE MOUNTING SCREWS (SEE MECHANICAL DRAWING)

| AVOID DIRECT SUNLIGHT !!! AND ALL OTHER LIGHT SOURCES WITH WAVELENGTH CLOSE TO 670nm (see Optical filter transmittance on figure below).

| ALWAYS KEEP OPTICAL WINDOWS CLEAN, FREE FROM DUST AND FINGERPRINTS, AVOID SCRATCHES ON THE OPTICAL WINDOWS.

| USE CORRECT VOLTAGE - SEE ELECTRICAL SPECIFICATION

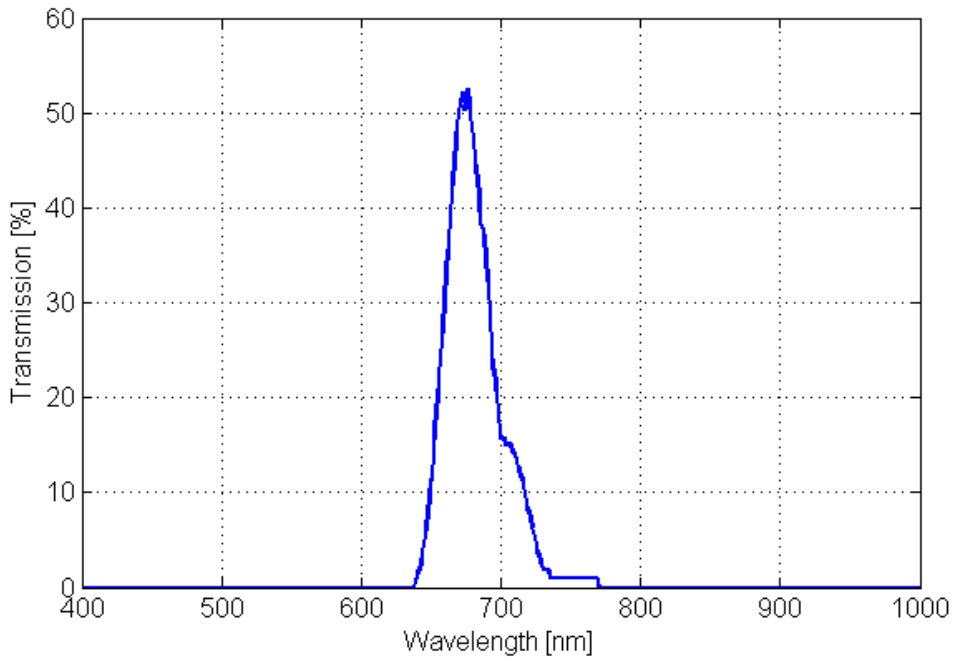


Figure: Ambient light optical filter

Laser Safety

ST2 Sensor is classified as Class 3R Laser device (Laser power < 3mW according to IEC 60825-1 or ANSI Z136.1).
A Class 3R laser is considered safe if handled carefully, with restricted beam viewing.

Figure: Class 3R Laser safety labels

8. WARRANTY

Warranty

METRALIGHT provides a **ONE YEAR** manufacturer's limited warranty against defective materials and workmanship. Please do not attempt to open the unit, as this will void all warranties.

Contacts

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