OptoFidelity
HAT-Optical-Sensor-01

Quick Reference

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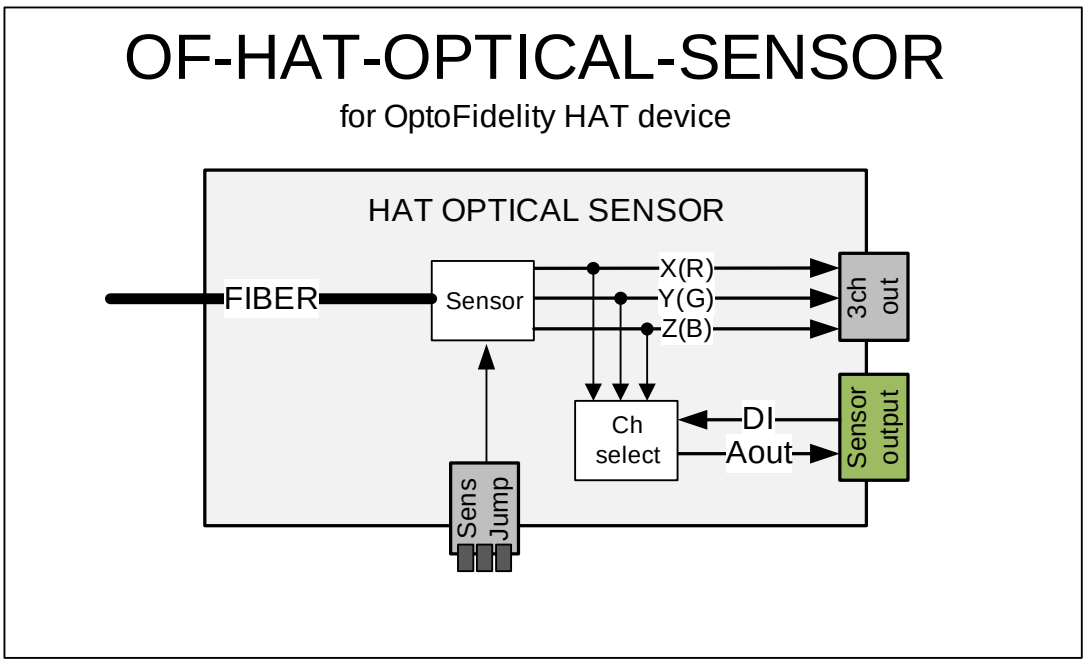
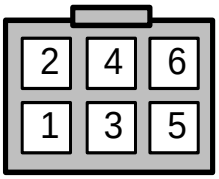
OptoFidelity

The *HAT Optical Sensor* can be used for detecting colors or light changes from the display of the device under test (DUT) by connecting it to sensor inputs of HAT device. The sensor has two working modes depending on how it is connected to the HAT device. The sensor can be connected by using either one or three sensor inputs of the HAT device. All three color channels can be measured simultaneously if three inputs are used. With one sensor input only one channel can be measured at time. The measured channel can be selected via software. The sensor has eight sensitivity modes, which can be selected with three jumpers. Optical fiber is used to transfer light from the DUT to sensor.



FRONT AND UPPER PANEL CONNECTIONS



1 = X out
2 = Vcc +5V in
3 = Y out
4 = GND
5 = Z out
6 = GND

FIBER IN: 2 mm optical fiber input

3-sensor output: 6-pin IDC connecter

Sensor output: Use MD6 male to MD6 male cable to connect the sensor to the HAT device.

BACK PANEL CONTROLS

Sensitivity selection: Sensor sensitivity can be selected with three jumpers. There are eight different sensitivity modes available.

ELECTRICAL CHARACTERISTICS

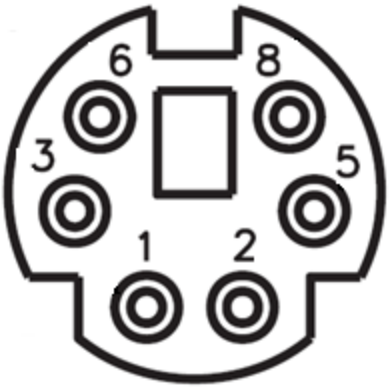
T_{amb} = 25 °C, unless otherwise specified, †

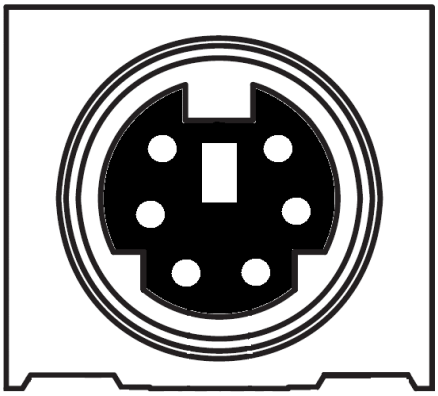
Characteristic	Symbol	Min	Typ	Max	Units
Diameter of the light sensitivity area		-	2.0	-	mm
Light sensitivity area per single color array (19 diodes)		-	0.79	-	mm^2
Typical photo sensitivity at 0 dB sensitivity	S_{max}				
λ_Z = 445 nm		-	34.9	-	$V/(\mu W/cm^2)$
λ_y = 555 nm		-	50.1	-	$V/(\mu W/cm^2)$
λ_{Xk} = 445 nm		-	18.2	-	$V/(\mu W/cm^2)$
λ_{XI} = 600 nm		-	53.2	-	$V/(\mu W/cm^2)$
Signal frequency at 0 dB sensitivity	f_{3dB}	4	6	16	kHz
Signal frequency at -58 dB sensitivity	f_{3dB}	160	300	580	kHz
Sensor A+ output voltage	AI+	0	2.40	2.40	V

† Exposure to the absolute maximum rated conditions for extended periods may affect the device reliability

NOTE: All voltages are with respect to GND

SENSOR OUTPUT PINOUT





Pin	Name	Description	Note
1	GND	Ground	
2	AI -	Sensor analog output ground	Single-ended
3	D0	Digital input	3.3 V logic
5	AI +	Sensor analog output	Single-ended
6	RESERVED	-	DO NOT CONNECT
8	VCC	Sensor voltage	

HAT SOFTWARE USAGE

Color channel selection in 1 sensor input case

The measured color channel can be selected with HAT SW control "*–sioX=[on|off|hiz]*". "X" is the sensor input number.

off = X(R) channel

hiz = Y(G) channel

on = Z(B) channel

Sensor type selection

The sensor type needs to be specified for the HAT SW when sensor is used. The correct type number for the optical sensor is **5** or **6**. Type 5 means that sensor is connected to three sensor inputs. Type 6 means that sensor is connected to one sensor input. The type is specified with HAT SW command "*-s X-6*". The "X" is the sensor input number. Note that if three sensors input mode is used, the inputs must be 1, 2 and 3.

Example command

The next command reads 10 samples from the optical sensor at 100 Hz sample rate and from Z(B) channel. The optical sensor is connected to one sensor input.

$ hat_ctrl -s 1-6 -sio1=on

When the optical sensor is connected to three sensor inputs, you can read all channels at the same time with the following command:

$ hat_ctrl -s 1-5

Another way is to use the sensor configuration file. The next command uses example sensor configuration file for the optical sensor:

$ hat_ctrl -c ../sensor_configs/config_opt_demo

DOCUMENTS AND SOFTWARE

More information and latest documentation can be found from MeeGo wiki:

http://wiki.meego.com/Quality/QA-tools/hat-control

Control software can be found from MeeGo gitorious:

http://meego.gitorious.org/meego-quality-assurance/hat-control

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