PPG-2TF-660
Transmittance SpO$_2$ Module

Works with the AECG100 main console or SECG 5.0 AIO Multi Vital Sign Simulator as the first transmittance SpO$_2$ performance tester designed for R&D in oximeter manufacturers

Outputs R and IR analog signals to test heart rate and blood oxygen saturation (SpO$_2$) functions
Individually adjustable AC, DC, and PI parameters of R/IR, and equipped with raw data playback function
Suitable for the development of transmittance PPG products such as finger clip oximeters and patient monitors

• Works with the AECG100 main console or SECG 5.0 AIO Multi Vital Sign Simulator to test heart rate, PPG, PWTT, and SpO$_2$ functions
• Adjustable SpO$_2$ parameters, such as AC, DC, and PI values of R/IR, to confirm the accuracy of oximeters
• Built-in 14 types of ambient light signals and respiratory variation simulation – add-on signals for more authentic testing
• Equipped with Auto Sequence function – sorts the parameters of different test items into a designated order for automated testing while eliminating the need to develop automated testing programs
• Raw data playback – plays recorded raw data or customized waveforms for repeated verification to facilitate the development process
• Provides SDK supporting multiplatform for users to flexibly develop automated testing programs
• Equipped with MCX to BNC ports to connect to an oscilloscope – outputs amplified and stable signals for viewing the voltage of AC analog signals of R/IR, optical signals received by the PPG-2TF-660, and the switch status of R/IR LED of oximeter
• Adjustable PPG waveform characteristic points, such as the Systolic Peak (SP), Dicrotic Notch (DN), and Diastolic Peak (DP), in a wide range and precise values for flexible test settings [1]
• Exclusive Auto Test SpO$_2$ Mode [2] – automatically calculates the DUT's DC value of R/IR and fills in the SpO$_2$ table to rapidly build the R curve, bringing convenience for testing the consistency of quality on oximeters [1]
• Built-in 6 transmission rates – simulates 5 finger types varying in color brightness and thickness, and neonatal foot test mode for measuring newborns to optimize algorithms [1]

Note: (1) Only available when paired with the AECG100.
(2) This mode is mainly for developers to quickly test for reference, not for after-sales calibration and testing on oximeters. If users require development tests on SpO$_2$ parameters and specifications, please use the SpO$_2$ Mode.

• PPG-2TF-660 Testing Scenario

DUT LED

PPG-2TF-660 Test Position

DUT PD

USB Connection

AECG100

(The image illustrates the testing scenario of the PPG-2TF-660 and AECG100.
Please refer to the user manual for detailed installation and instructions when using PPG-2TF-660 with AECG100 or SECG 5.0 AIO.)

• Specifications

Parameters	Specifications	
Heart Rate	Setting Range	10 ~ 300BPM
	Minimum Step Size	1BPM
	Accuracy	±1BPM
LED DC Level Reference Output	Setting Range [1]	30 ~ 3000mV
	Minimum Step Size	1mV
LED AC Level Reference Output	Setting Range [1]	0.75 ~ 30mV
	Minimum Step Size	0.01mV
PI (AC level / DC level) [2]	Setting Range	0.025% ~ 30% (AC / DC, varies with AC or DC level)
	Accuracy	NA
LED1 Absolute Irradiance (100%)§	Intensity	2.36mW / m^2
	Accuracy	±15%
LED2 Absolute Irradiance (ambient light)§	Intensity	0.25mW / m^2
	Accuracy	±15%
LED Scan Rate	Rate	50 ~ 40kHz (Normal mode / Standalone mode) [3] 10kHz (Raw data mode)
	Accuracy	±5µs
PD Sample Rate	Rate	250kHz (Single channel)
	Accuracy	±5µs
PD Response Time	Rising	1µs Typical [4]
	Falling	1µs Typical [4]
SpO2 % SpO2 parameter specifications [5]	Setting Range	1% ~ 100%
	Minimum Step Size	1%
	Accuracy	91% ~ 100%: ±1% + specified accuracy of the DUT 81% ~ 90%: ±2% + specified accuracy of the DUT 71% ~ 80%: ±3% + specified accuracy of the DUT Below 70%: with unspecified accuracy
MCX LED Voltage	Amplitude	AC level x 100
	Accuracy	±5%

§ Data Collection Method : To connect the spectrometer with a 2-inch integrating sphere, and fix the integrating sphere on the DUT to measure the absolute irradiance of the LED of the DUT.

Note:
(1) The AECG100 and SECG 5.0 AIO test systems adjust AC/DC output according to the linearity of LED electro-optical conversion.
(2) The PI value may vary according to the different calculation methods of each manufacturer.
(3) When used with the AECG100, it supports normal mode, standalone mode, and raw data mode; when used with the SECG 5.0 AIO, only the raw data mode is applicable.
(4) PD response time varies with the light intensity of the DUT.
(5) The SpO2 parameter specifications apply to SpO2 Test Mode.

• Ordering Information

SpO2 Module

Part No.	Description	Quantity
100-AE00007	**Model No.**: PPG-2TF-660 **Model Name**: Transmittance SpO2 module (two MCX (RF) male to BNC cables included)	1

Compatible Products

Part No.	Description	Quantity
100-AE00001	**Model No.**: AECG100 The main console unit for ECG testing.	1
100-EC00002	**Model No.**: SECG 5.0 AIO **Model Name**: Multi Vital Sign Simulator The standalone ECG simulator with 12 leads (RA, LA, LL, N, V1 - V6) output for ECG performance tests.	1

Optional Accessories

Part No.	Description	Quantity
K29-0300601	MCX (RF) male to BNC cable (30cm)	1

Optional Calibration Service and Warranty Extension

Part No.	Description
YY0007	**Model No.**: C3 Provides (3) years of calibration service coverage. WhaleTeq equipment can be calibrated to original performance on the basis of (1) year interval.
YY0008	**Model No.**: R3 Extends the limited warranty from (1) year to (3) years.