

The A7585/DT5485 series is a family of high-performance, ultra-low ripple bias power supplies designed specifically for Silicon Photomultiplier (SiPM) applications. With high precision, temperature compensation, and multiple control interfaces (USB, UART, I2C), these modules ensure optimal SiPM performance across scientific, medical, and industrial applications. As part of the control suite, the ZEUS software and C/Python libraries are available, for easy management of the unit.

Key Applications:

- PET scanners and medical imaging
- Particle detectors and physics experiments
- LIDAR systems
- Low-light-level photon counting

Features

- **Output Voltage Range:** 20 V to 85 V
- **Max. load current :** 10 mA
- **Fine Voltage setting:** 1mV steps
- **Low ripple noise*:** 0.2 mVpp typ.
- **Temperature stability:** 1.25 mV/°C
- **Built-in Temperature Compensation** with programmable coefficients
- **Interfaces:** UART, I2C, USB
- **Software support:** ZEUS GUI and C/Python libraries
- **Compact Footprint:** SMD and Desktop modules

* DT5485PB with no load, 10 μ s integration time, USB disconnected



Absolute Maximum Ratings

Parameter	Symbol	Condition	Value	Unit
Supply Voltage	V _s		28	V
Operating temperature	T _o	No dew condensation	-10 to 60	°C
Storage temperature	T _s	No dew condensation	-20 to 80	°C
Humidity		No dew condensation	20 to 80	%

Note: exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings

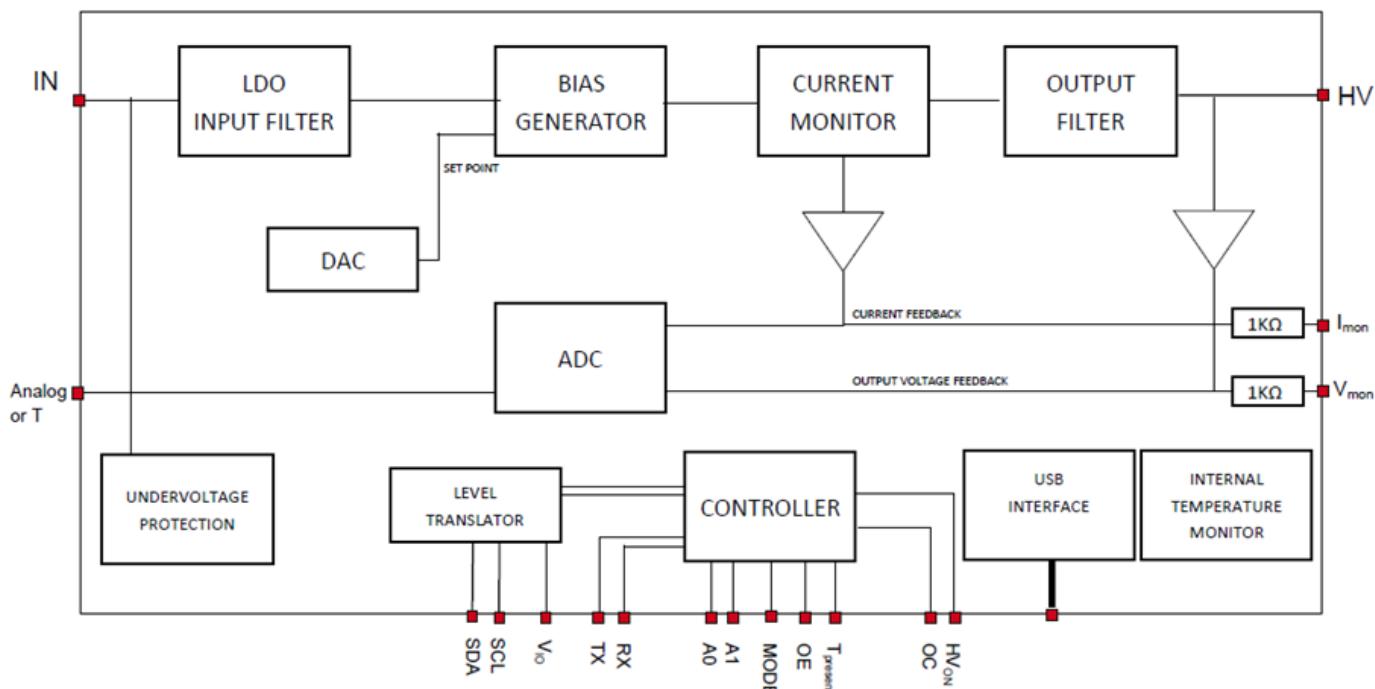
Recommended operating conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	V _s		6	12		V

Mechanical & Packaging

Model	Package Type	Connectors	Dimensions (mm x mm x mm)
A7585D	SMD	-	35.6 x 42.1 x 5.4
A7585DU	Through-hole	MicroUSB	44 x 44.5 x 13.3
DT5485P	Desktop (power over USB)	MicroUSB, HVout, T-IN	84 x 71.7 x 19
DT5485PB	Desktop (AC/DC power)	USB-B, AC/DC power, HVout, T-IN	126 x 106.1 x 33.6

Block diagram



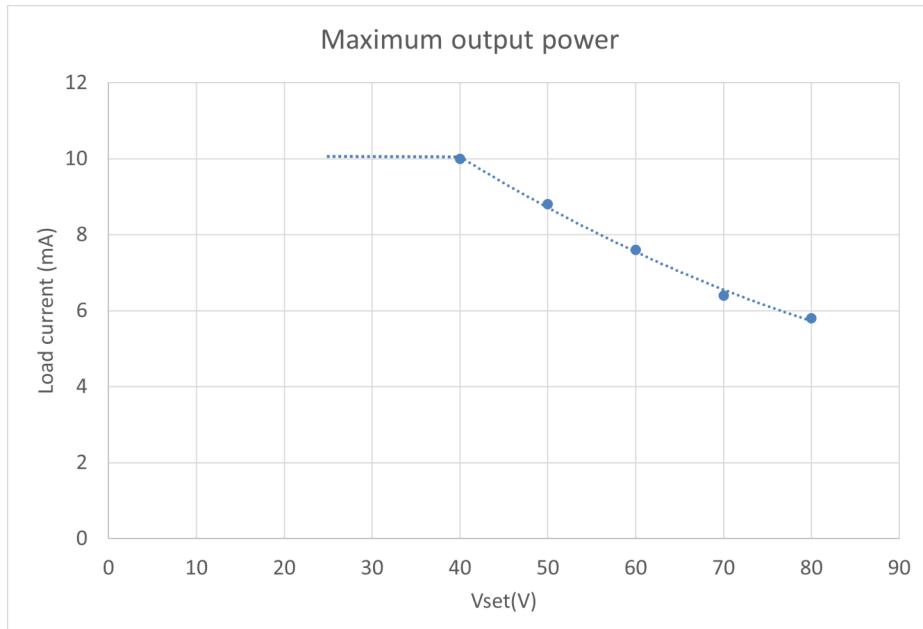
Electrical characteristics (typ. $T_a=25$ °C, measured with DT5485P, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	V _s		6	12	15	V
Current Consumption	I _{cc}	V _o = 50V, no load, V _s =6V		39		mA
Output voltage	V _{out}		20		85	V
Voltage setting resolution				1		mV
V _{out} vs. V _{set} precision		No load		0.05%+30		mV
Voltage Monitor	V _{mon}		0		85	V
V _{mon} vs. V _{out} precision		No load		0.1%+20		mV
Output Current	I _o	V _s =6V	0		10	mA
Current Monitor resolution		Low range	100			nA
		High range				
Output power				0.5W ± 10%		
Ramp up/down (nominal value)		Depending on load	0.1		10000	V/s
Ramp up/down step				1		mV/s
Ripple noise		DT5485PB - V _o = 70V, no load, 10 μs integration time, USB disconnected		0.2		mVpp
I _{mon} vs. I _{out} accuracy		Low range	±0.2%±2μA			
		High range				
Temperature Stability		T _a = 25 ± 10 °C		1.25		mV/°C
Output Impedance	R _o			10		Ω
Digital Input	V _i -IL		0		0.5	V
	V _i -IH		3		5	V
Digital Output	V _o -IL			4.5	4.6	V
	V _o -IH			0		V

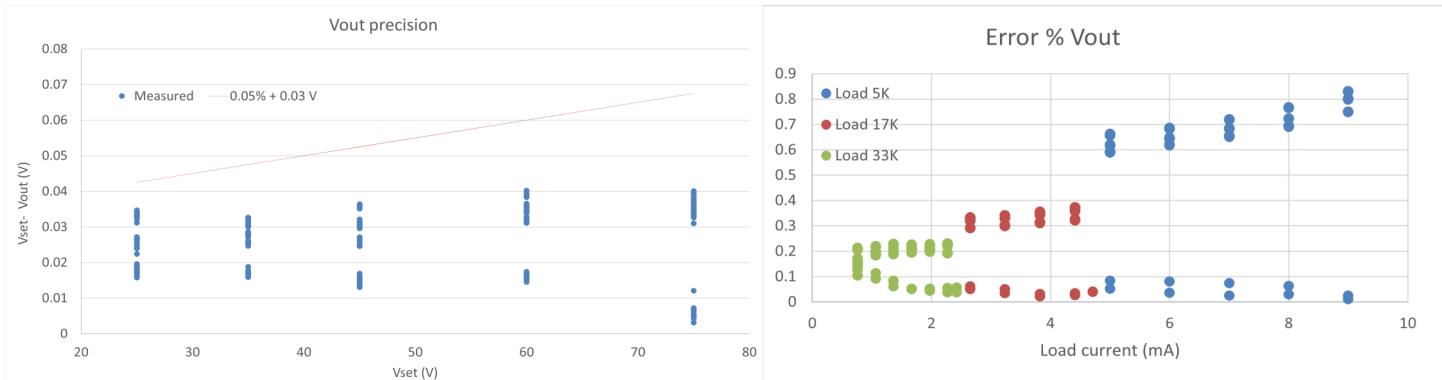


WARNING! HV output produces extremely hazardous high voltages at a potentially lethal current level; never connect or disconnect the HV OUTPUT with the module powered ON; always switch OFF and wait at least 30s before connecting or disconnecting any load or cable

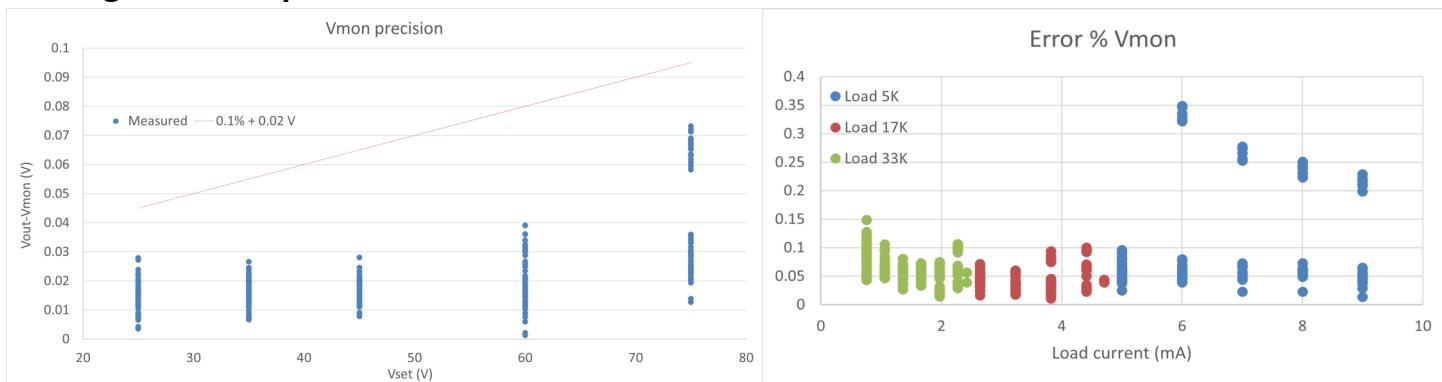
Max. output power



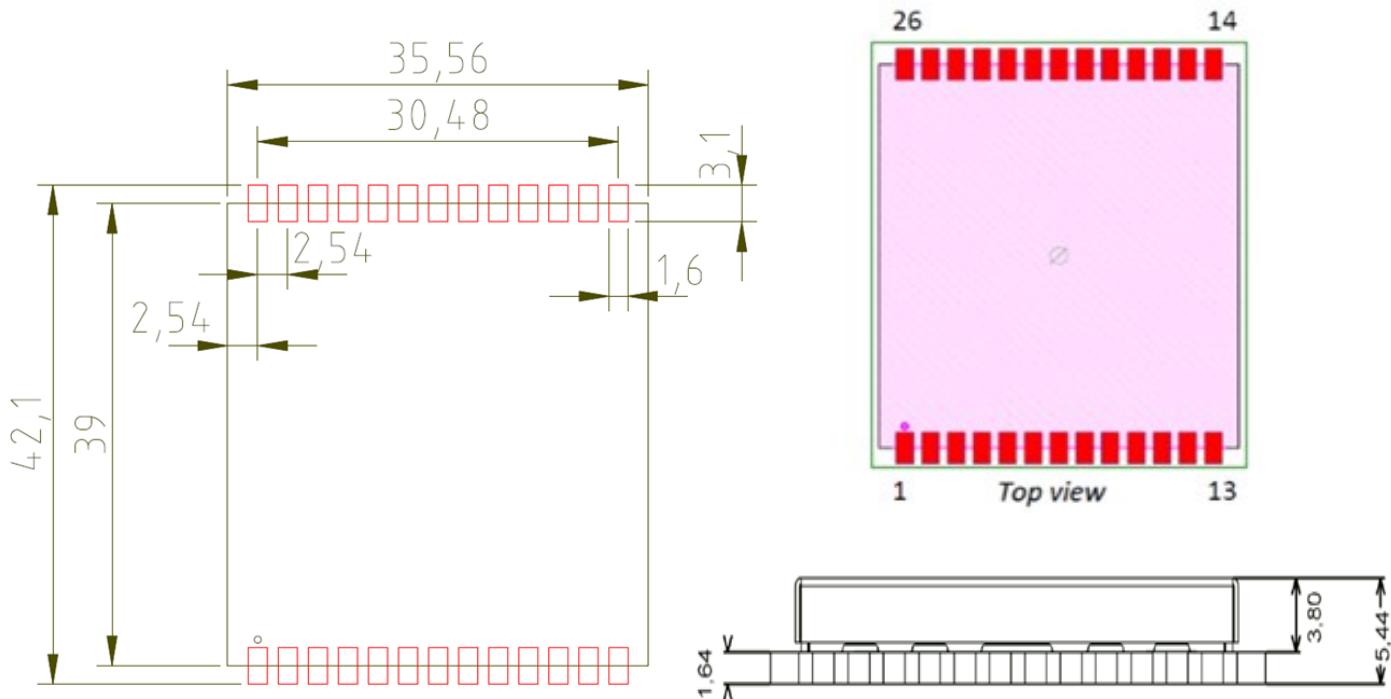
Output Voltage precision and error



Voltage monitor precision and error



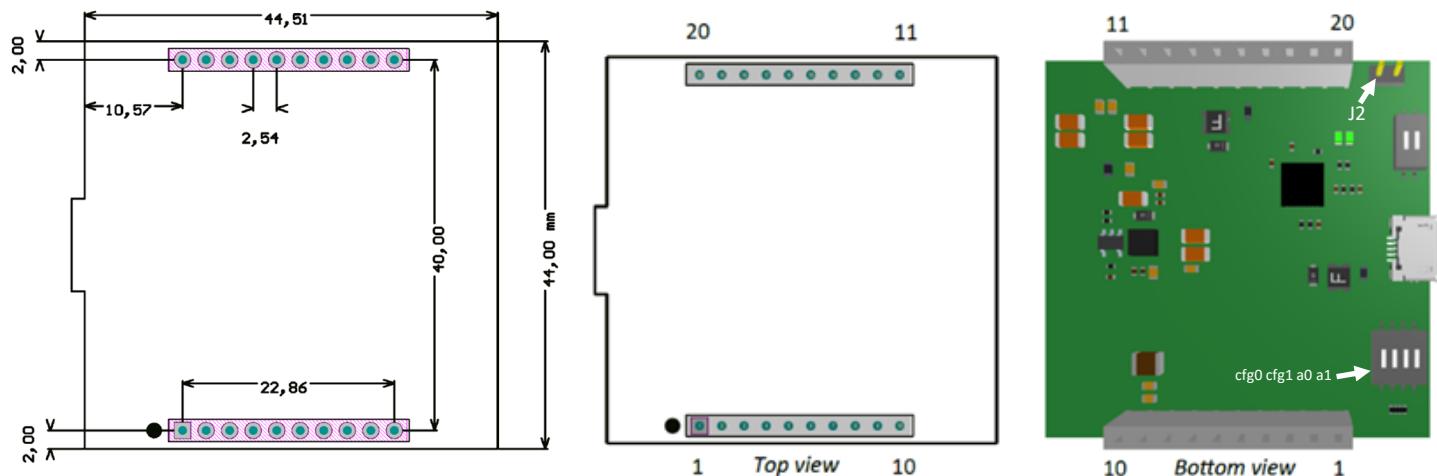
A7585D dimensional outline (unit: mm) and pin assignment



Packaging: SMD

N.	NAME	TYPE	DESCRIPTION
1,16,26	GND		Ground
2	OUTPUT STATUS	OUT	Indicates the presence of HV power on output pin When logic-high the HV output is enabled, when low the HV is off.
3	OVER-CURRENT	OUT	Module has been shut down due to overcurrent protection. The overcurrent protection is digitally programmable. When logic-high the unit is in overcurrent status
4	TEMP SENSOR CONNECTED	IN	When high (+3.3 to +5V) the temperature measurement is enabled
5,6,7	NC		No connection. These pins should not be connected to any terminals
8	MODE SELECT	IN	Select control mode (pin must be stable on power on): 0 = <i>Digital Control Mode</i> , 1 = <i>Analog Control Mode</i>
9	POWER CONTROL	IN	Output enable pin: <i>Analog Control Mode</i> : when logic-high(1) Vout=ON, when logic-low(0) Vout= OFF <i>Digital Control Mode</i> : On power on, when logic-high(1) Vout=ON , when logic-low(0) Vout=OFF; during operation: 0→1 transition, Vout is enabled / 1→0 transition, Vout is disabled
10	MODULE RESET	NC	Module hardware reset. Normally logic-high. Logic-low = reset command
11	I2C ADDRESS 1	IN	I2C Address bit 1. Internally pull-up INTERNALLY INVERTED
12	I2C ADDRESS 0	IN	I2C Address bit 0. Internally pull-up INTERNALLY INVERTED
13	ANALOG IN	IN	Analog Control Mode: Reference voltage to regulate output voltage; Digital Control Mode: Thermometer input
14,15	Vout	HV	HV Output
17	VMON	OUT	Analog V monitor output. Proportional to the output voltage in the range 0÷5V
18	IMON	OUT	Analog I monitor output. Proportional to the output current in the range 0÷5V
19	UART RX	IN	UART RX pin. 115200 bps,8,1,n. 5V ONLY
20	UART TX	OUT	UART TX pin. 115200 bps,8,1,n. 5V ONLY
21	I2C SDA	IN/OUT	Serial Data pin of I2C slave bus.
22	I2C SCL	IN	Serial Clock pin of the I2C slave bus
23	I2C VDD	POWER	Input pin to power the I2C voltage translator. 1.8V to 5V
24,25	Vs	POWER	6V to 28V

A7585DU dimensional outline (unit: mm) and pin assignment



Note: the A7585DU is provided with the 2.54 mm strips unsoldered. Two male and two female strips are provided within the kit, together with a jumper.

Packaging: Through-Hole

N.	NAME	TYPE	DESCRIPTION
1	ANALOG IN	IN	Analog Control Mode: Reference voltage to regulate output voltage; Digital Control Mode: Thermometer input
2	I2C ADDRESS 1	IN	I2C Address bit 1. Internally pull-up INTERNALLY INVERTED
3	I2C ADDRESS 0	IN	I2C Address bit 0. Internally pull-up INTERNALLY INVERTED
4	POWER CONTROL (cfg1)	IN	Output enable pin: <i>Analog Control Mode</i> : when logic-high(1) Vout=ON, when logic-low(0) Vout= OFF <i>Digital Control Mode</i> : On power on, when logic-high(1) Vout=ON , when logic-low(0) Vout=OFF; during operation: 0→1 transition, Vout is enabled / 1→0 transition, Vout is disabled
5	MODE SELECT (cfg0)	IN	Select control mode (pin must be stable on power on): 0 = <i>Digital Control Mode</i> , 1 = <i>Analog Control Mode</i>
6,9,20	GND		Ground
7	IMON	OUT	Analog Imon output. Proportional to the output current in the range 0÷5V
8	VMON	OUT	Analog Vmon output. Proportional to the output voltage in the range 0÷5V
10	Vout	HV	HV Output
11	I2C VDD	POWER	Input pin to power the I2C voltage translator. 1.8V to 5V
12	I2C SCL	IN	Serial Clock pin of the I2C slave bus
13	I2C SDA	IN/OUT	Serial Data pin of I2C slave bus.
14	UART TX	OUT	UART TX pin. 115200 bps,8,1,n. 5V ONLY
15	UART RX	IN	UART RX pin. 115200 bps,8,1,n. 5V ONLY
16	Vs	POWER	USB disconnected: power supply USB connected: Vs > 6V module powered from Vs, otherwise USB powered.
17	TEMP SENSOR CONNECTED	IN	When high (+3.3 to +5V) the temperature measurement is enabled
18	OVER-CURRENT	OUT	Module has been shut down due to overcurrent protection. The overcurrent protection is digitally programmable. When logic-high the unit is in overcurrent status
19	OUTPUT STATUS	OUT	Indicates the presence of HV power on output pin. When logic 1 the HV output is enabled, when 0 the HV is off.

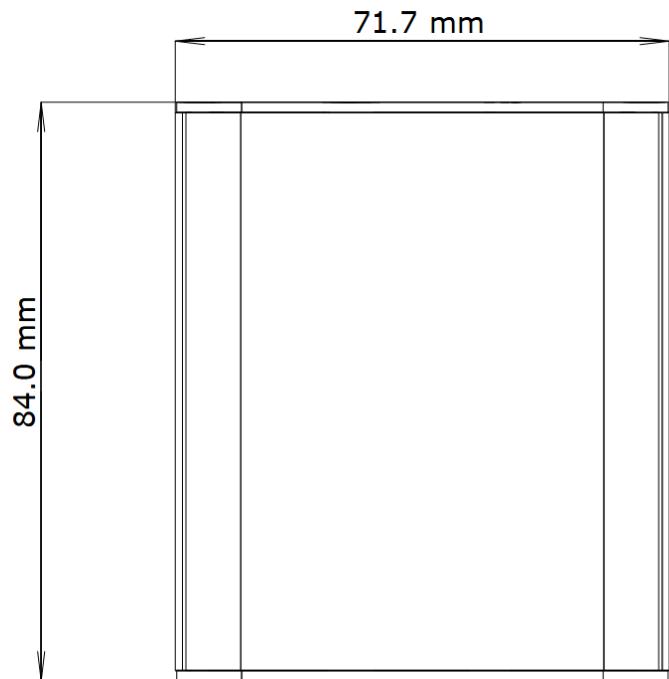
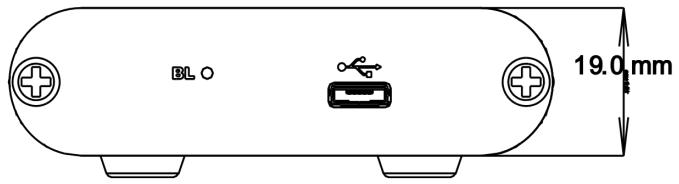
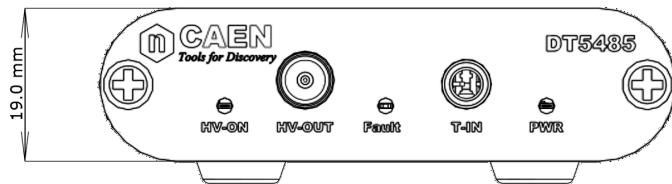
Connectors, jumpers and switches

USB	Micro USB; USB connection and power supply input
J1	Bootloader jumper for firmware update (refer to User Manual). Inserted = bootloader mode
cfg0	= Mode select. See description above. ON = logic-low state (0)
cfg1	= Power Control. See description above. ON = logic-low state (0)
a0	= I2C ADDRESS 0. See description above. ON = 1
a1	= I2C ADDRESS 1. See description above. ON = 1

DT5485P dimensional outline



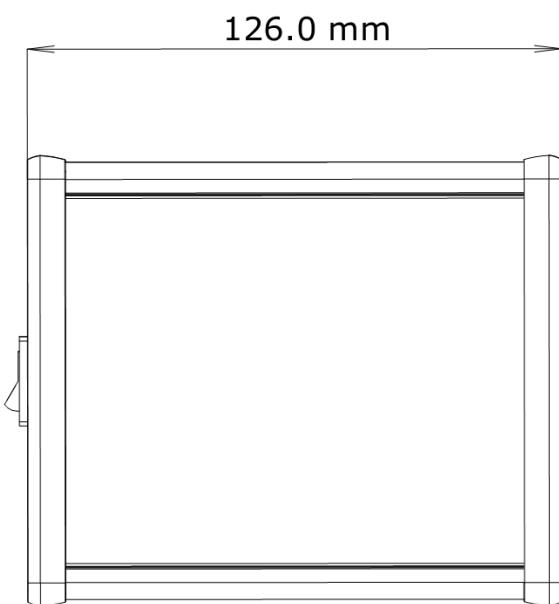
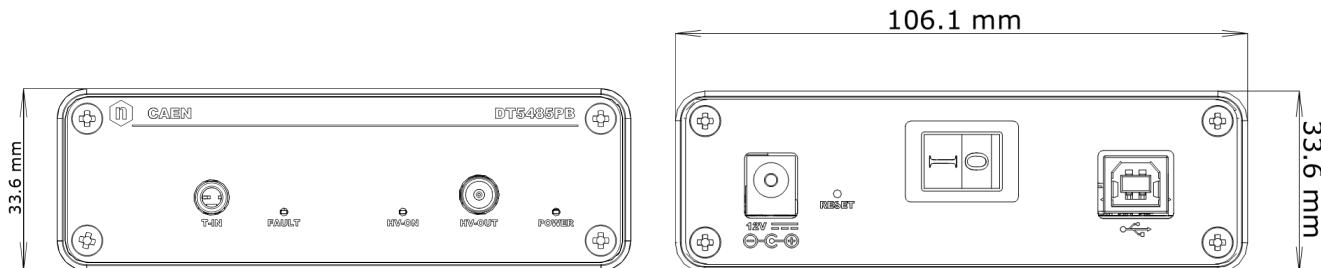
Panels description	
HV-OUT	Voltage output—LEMO 00 connector
T-IN	Temperature probe input—3.5mm socket
USB	Micro USB; USB connection and power supply input
BL	Boot Loader press-on contact; used for firmware update (refer to User Manual)
LEDs	Power: lit when unit is on; HV-ON: lit when output is enabled; Fault: lit when alarm is detected



DT5485PB dimensional outline



Panels description	
HV out	Voltage output—LEMO 00 connector
T-IN	Temperature probe input—3.5mm socket
USB	USB communication - B type
12V	2.0 mm DC Power Jack— +12V DC Input
RESET	Boot Loader press-on contact; used for firmware update (refer to firmware documentation)
LEDs	Power: lit when unit is on; HV-ON: lit when output is enabled; Fault: lit when alarm is detected



Ordering Option

Ordering code	Description
WA7585DXAAA	A7585D - Digital Controlled Power Supply for Sipm +85V 10mA
WA7585DUXAAA	A7585DU - USB Controlled Power Supply for Sipm +85V 10mA
WDT5485XPAAA	DT5485P - Digital Controlled Power Supply for SiPM +85V 10mA
WDT5485PBXAA	DT5485PB - Digital Controlled Power Supply for SiPM +85V 10mA, external power

