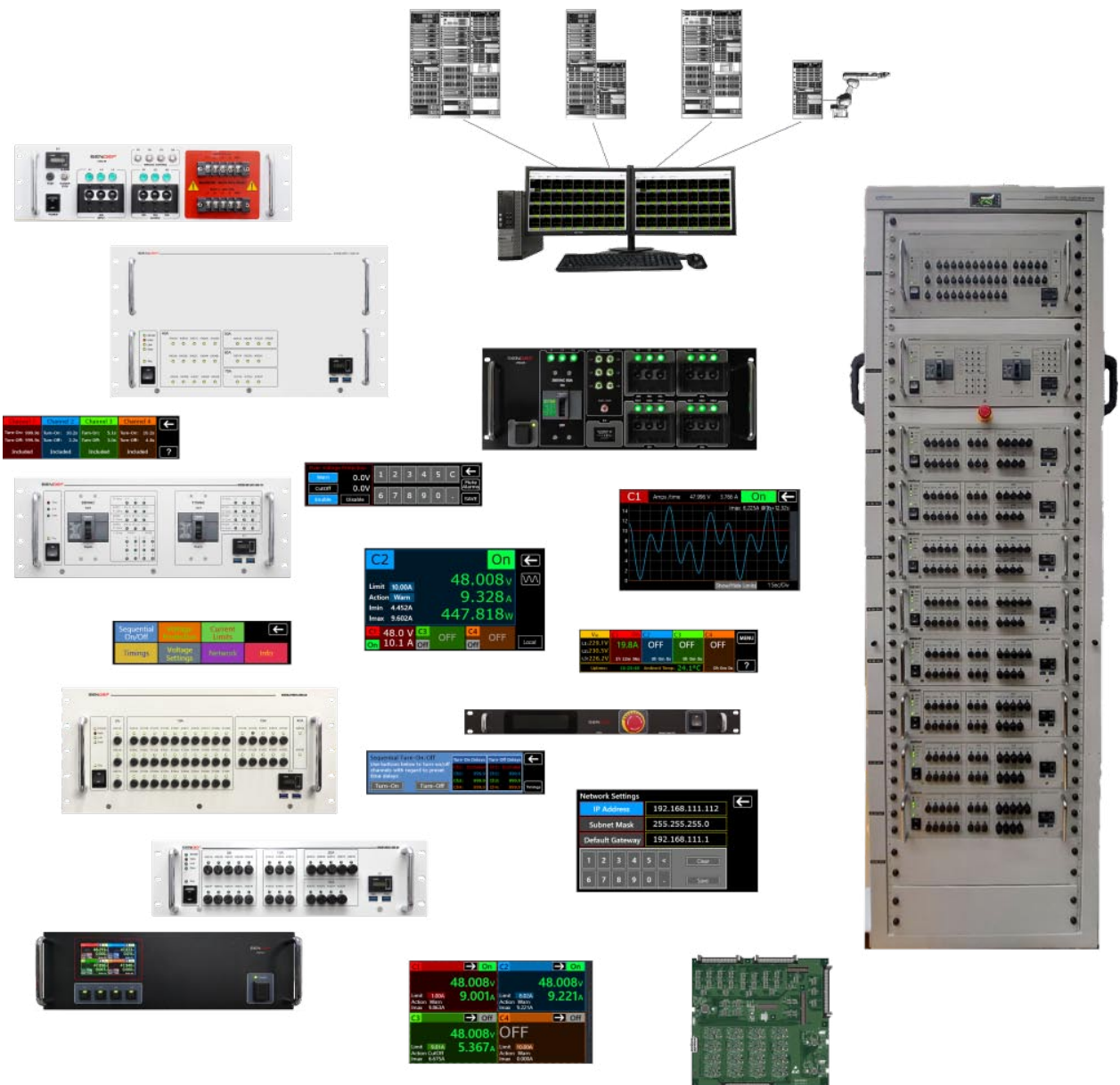


SENDEF
2023 Catalog



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SENDEF

iPDU Series Programmable AC/DC Power Distribution Units

Software Controlled
SCPI over IP

Touch Screen TFT LCD display for manual operation

Long term data acquisition

Current Limiting with Cutoff and Warn options

Over/Under Voltage protection with different Warn and Cutoff levels

19" Rack mount



SENDEF iPDU is a software-controlled, intelligent Power Distribution Unit, designed for use in industrial automation and automatic test equipments.

Units have single and three phase outputs depending on the model.

Output channels can be turned on/off sequentially at specified times. Desired channels in order can be included/excluded in/from the on-off scenario. Sequential on-off times are adjustable between 0.1 seconds and 999.9 seconds.

Units can also be managed with PDU Manager software over the 10/100 Mbits Ethernet interface. Sequential on-off scenarios created with PDU Manager software are independent of the RCU.

iPDU supports SCPI protocol. Users can integrate the units into their own environment using the SCPI protocol over the Ethernet interface.

All the settings and configurations can be made through Touch Screen TFT LCD on the Remote Control Unit (RCU). There is an Emergency Stop Button on the RCU, as well. Live status of all channels can be monitored on the RCU main screen. Please see RCU Section for more details.

There is a 105 dBA buzzer inside the PDU. Besides visual warnings, current/voltage anomalies are notified to the user audibly.

There is a real time counter (ETI) on the PDU. ETI is independent of all other components and it shows the total time that the unit has remained active.

In the front panel of the PDU, there are manual on/off switches and for standalone operation and thermal circuit breakers.

Features

- *19" Rack Mount (height depends on the configuration)*
- *Input voltage measurement*
- *Precision output current measurement for each outlet group*
- *SCPI over TCP/IP*
- *PDU Manager support*
- *Adjustable Under/Over Voltage Protection (Warning and Cut-off limits can be set independently)*
- *Adjustable Current Limit Function (Independent for each output group. With Cut/Warn options)*
- *Sequential on-off (0.1 sec – 999.9secs)*
- *Input/Output indicators*
- *Elapsed Time Indicator*
- *IEC 320 C13/C19 outputs*
- *Terminal Block Outputs*
- *Ambient temperature sensor*

→ *iPDU can be ordered in different input-output configurations according to user requirements. See Part Numbering Section.*

Mostly ordered configurations

iPDU Series	Voltage	Current	Total Power	#/Type Channels	Input	Output
iPDU-M40-1P40-3G20	380VAC	120A	26.4kW	(4) 380VAC 3~ 40A/ 1 Channel 220VAC 1~ 20A/ 3 Channels	5 Pole Terminal Block	3~ Channel: 5 Pole Terminal Block 1~ Channels: 3x6 IEC 320 C13
iPDU-M40-3G40	380VAC	120A	26.4kW	(3) 220VAC 1~ 40A/ 3 Channels	5 Pole Terminal Block	3x6 IEC 320 C13 + 3 Pole Terminal Block
iPDU-M60-3P30-3G30	380VAC	180A	39.6kW	(6) 380VAC 3~ 30A/ 3 Channel 220VAC 1~ 30A/3 Channels	5 Pole Terminal Block	3~ Channels: 5 Pole Terminal Block 1~ Channels: 3x6 IEC 320 C13
iPDU-L20-16G16	220VAC	20A	3.5kW	(16) 220VAC 1~ 16A/ 16 Channels	IEC 320 C20	16x1 IEC 320 C13
iPDU-H330-28DC	20-30VDC	330A	10kW	Bkz. iPDU-28DC	9+9 Pole Terminal Block	MIL-DTL-5015 Connectors

iPDU-M60-3G30-3P30



60 Ampere/phase inputs, 3 x 3-phase 30A and 3 single-phase 30A output groups. Each 30A outlet group comprise 6 x IEC 320 C13 outlets. In single phase channels, line and neutral are switched together. Output channels can be controlled with the manual on/off buttons on the PDU, via the RCU, through the PDU Manager software or via the SCPI interface.

iPDU-M40-1P40-3G20-TB



40 Ampere/ phase input. 1 x 3-phase 40A and 3 single-phase 20/30/40A output groups. Each 20/30/40A outlet group offers 6 IEC 320 C13 and 1 Terminal Block (optional) connections. In single phase channels, line and neutral are switched together. Output channels can be controlled with the manual on/off buttons on the PDU, via the RCU, through the PDU Manager software or via the SCPI interface.

The unit also has a non-switching, 1 input (IEC 230 C14) / 3 output (IEC 230 C13), UPS multiplexer.

iPDU-L20-16G16



This model has 16 output channels grouped into 4 groups. Although each channel can be turned on and off independently, current measurements are made on the basis of groups.

The front panel comprises a 4.3" touch screen TFT display, and an emergency stop button. Input is protected by this 20A thermal circuit breaker which is located in the front panel, too.

Channels can be controlled from the touch screen or with the buttons located on the front panel. There is an LED indicator on the relevant button that shows The relevant channel on/off status

236V				Uptime 12:33:48		15.8A		MENU
C1	C2	C3	C4	G1	8.1A			
C5	C6	C7	C8	G2	3.9A			
C9	C10	C11	C12	G3	1.2A			
C13	C14	C15	C16	G4	2.6A			

→ This model is not compatible with PDU Manager Software!

Remote Control Unit - RCU



The Remote Control Unit, RCU, is designed to be used with iPDU series Power Distribution Units.

The RCU is a 1U high PDU control and management unit. It provides easy access for PDU monitoring and configuration operations.

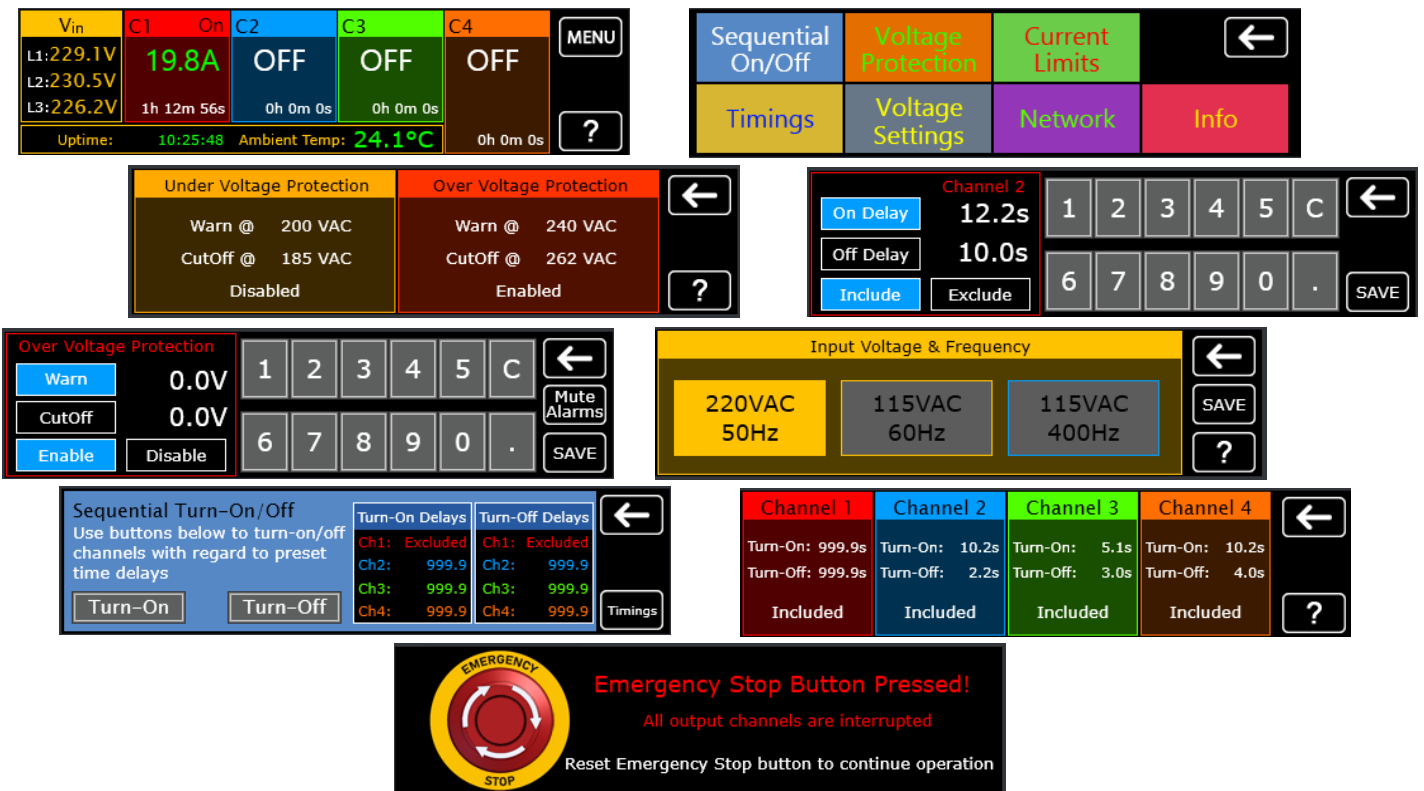
Usually, the PDU is placed at the back of the rack in automatic test systems. The RCU is used in the front, at a location that the user can access at any time easily.

Despite its simple appearance, RCU is a sophisticated remote management and control unit. It has a 3.8” touch TFT LCD screen. All configurations and settings regarding the PDU can be made through this touch screen. These include, Channel On/Off, Sequential On/Off Time Setting, Setting Current Limits and Behaviors, Voltage Protection Settings, Network Parameter Settings and more.

There is also a mechanical Emergency Stop Button on the RCU. It offers the user the opportunity to cut off the output voltage when an unexpected situation occurs in the user’s system. When pressed, all output channels, are cut off mechanically, without interaction of any electronics, processors etc.. To reset, you need to turn the button.

3.8” Touch Screen TFT LCD Display

Users can perform all operations such as management, configuration and monitoring using the multi-function touch screen.



iPDU Series DC Power Distribution Units

SENDEF iPDU Series DC Power Distribution Units (PDU) are designed and manufactured for use in industrial automation and automatic test systems. Unlike the SGDB series, iPDUs are designed to operate as standalone systems. However, management and monitoring through computer software is always possible.

Thanks to the touch screen on the front panel, units can always be managed without the need for an additional administrative software interface.

Current and voltage measurements are made with high precision for all output channels. Current limit can be set for each channel. When the specified limit is reached, it can be preferred to cutoff the channel automatically or keep it open with a audiovisual warning.

The Power Distribution Unit is designed as solid state in modular structure in BPS configuration. Each 5/6 channel is controlled by 1 microprocessor. Therefore, when it is detected that any channel has reached the set limit values, response is performed in a short time near 10 microseconds.

On the start up time a self test is executed. The main processor of the unit checks all channels and communication with submodules during to be sure that everything is working correctly. If the test is successful, it goes into normal operating mode and connects the voltage applied to the input to other internal units.

During normal operation, communication with all channels and submodules is constantly monitored. In this way, if a situation occurs where the main processor cannot control due to any malfunction, the input voltage is isolated from the output very quickly. This isolation is provided by high capacity circuit breaker(s) located at the input.

This isolation mechanism can also be triggered both by a physical Emergency Stop Button and the soft-button on the PDU Manager software. More than one PDUs can be controlled with a single Emergency Stop Button by making a chain connection through the Emergency Stop Connector on the unit. In addition, each output channel is also protected by a thermal fuse.

Besides firmware updates, basic settings like IP address, etc., can be made when necessary, via the Serial Interfaces on the front panel of the unit. In addition, detailed information can be obtained at the lower level about the status of unit's subcomponents when necessary. The start up test stages can also be monitored via those serial interfaces.

The front panel also includes a time counter (ETI) that shows how long the unit has been active; input voltage, network connection, data exchange and fault indicators, and output LED indicators directly connected to each output channel.

Features

- *Can be integrated to SGDB Series 28VDC/270VDC vs AC115/380 PDUs*
- *Can be integrated to iPDU Series PDUs and iPSU Series Power Supply Units*
- *Management via PDU Manager and long term data acquisition*
- *10 Microsecond current limit response time*
- *1% Measurement accuracy*
- *Capacity dimensioning owing to modular structure*

iPDU-H400-28DC



A standalone, 20-30VDC Power Distribution Unit, with a large 7-inch touch screen, eliminating the requirement for a computer interface or remote management unit.

There are a total of 25 output channels which can be configured in different current capacities.

Current limit can be determined for each channel. Additionally, there are “warn and continue” and “cut off” options when the channel reaches the current limit.

Sequential turn on and off options are available at user-specified time intervals. (If controlled via PDU Manager, 4 nested level on/off scenarios can be created. For details, please review the PDU Manager section of this document.)

The unit has also high/low voltage protection. Levels are determined at the production stage in line with user demand.

The screen design has the same structure as the PDU Manager screen. In this way, the user does not need to learn different interfaces. This provides ease of operation.

PDU_28_GK1 K051A 28.7v 0.2A DC LIMIT 5.0 A ON NORMAL	PDU_28_GK1 K051B 28.7v 3.1A DC LIMIT 5.0 A ON NORMAL	PDU_28_GK1 K051C 28.7v 1.3A DC LIMIT 5.0 A ON NORMAL	PDU_28_GK1 K051D 28.7v 2.2A DC LIMIT 5.0 A ON NORMAL	PDU_28_GK1 K051E 28.7v 4.5A DC LIMIT 5.0 A ON NORMAL	ON
PDU_28_GK1 K101A 0.1v 0.1A DC LIMIT 10.0 A OFF NORMAL	PDU_28_GK1 K101B 0.1v 0.1A DC LIMIT 10.0 A OFF NORMAL	PDU_28_GK1 K101C 0.1v 0.0A DC LIMIT 10.0 A OFF NORMAL	PDU_28_GK1 K101D 28.7v 7.2A DC LIMIT 10.0 A ON NORMAL	PDU_28_GK1 K101E 28.7v 9.5A DC LIMIT 10.0 A ON NORMAL	LIMITS
PDU_28_GK1 K201A 28.7v 0.2A DC LIMIT 20.0 A ON NORMAL	PDU_28_GK1 K201B 28.7v 6.8A DC LIMIT 20.0 A ON NORMAL	PDU_28_GK1 K201C 0.1v 0.0A DC LIMIT 20.0 A OFF NORMAL	PDU_28_GK1 K201D 0.1v 0.1A DC LIMIT 20.0 A OFF NORMAL	PDU_28_GK1 K201E 0.2v 0.1A DC LIMIT 20.0 A OFF NORMAL	TIMINGS
PDU_28_GK1 K301A 0.1v 0.1A DC LIMIT 30.0 A OFF NORMAL	PDU_28_GK1 K301B 28.7v 3.6A DC LIMIT 30.0 A ON NORMAL	PDU_28_GK1 K301C 0.2v 0.1A DC LIMIT 30.0 A OFF NORMAL	PDU_28_GK1 K301D 28.7v 11.2A DC LIMIT 30.0 A ON NORMAL	PDU_28_GK1 K301E 0.1v 0.1A DC LIMIT 30.0 A OFF NORMAL	AUTO
					NETWORK
					INFO
					HELP

The unit supports 15 LP (up to 10 amps) and 10 HP (up to 30 amps) output channels and can be ordered in different configurations according to user requirements. For example:

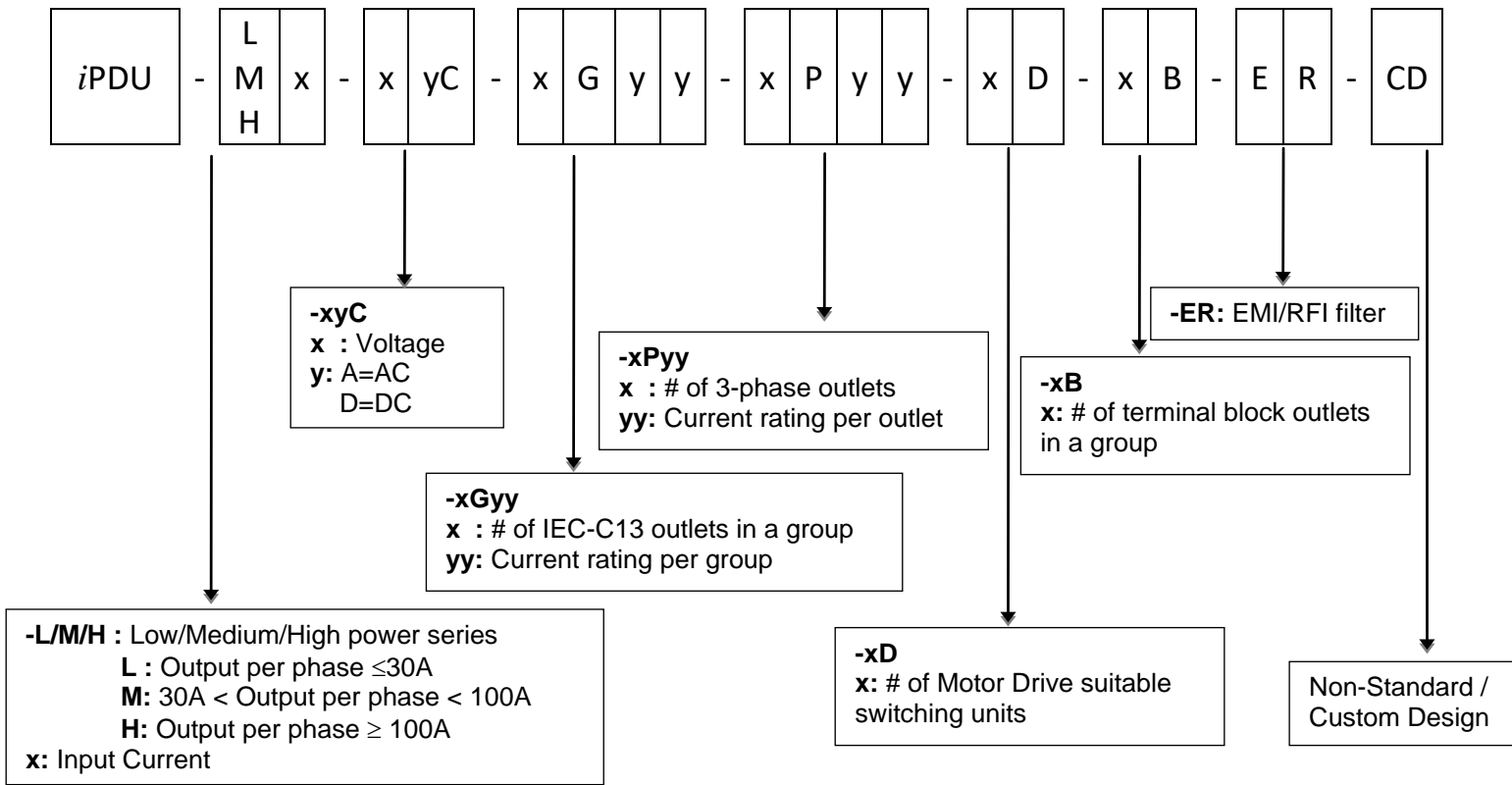
- 25x10A, a total of 250A
- 10x5A, 5x10A, 5x20A, 5x30A, a total of 350A
- 15x10A, 10x20A, a total of 350A
- 15x10A, 5x20A, 5x30A a total of 400A,

are some of the alternative configurations.

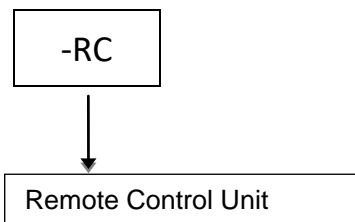
iPDU-270DC

iPDU series 270VDC Power Distribution Unit, **iPDU-270DC** is under development

iPDU Series Power Distribution Units Part Number Guide



* Some of the options are mutually exclusive. e.g. a DC unit can not be configured with 3-phase outputs. Please check before ordering.

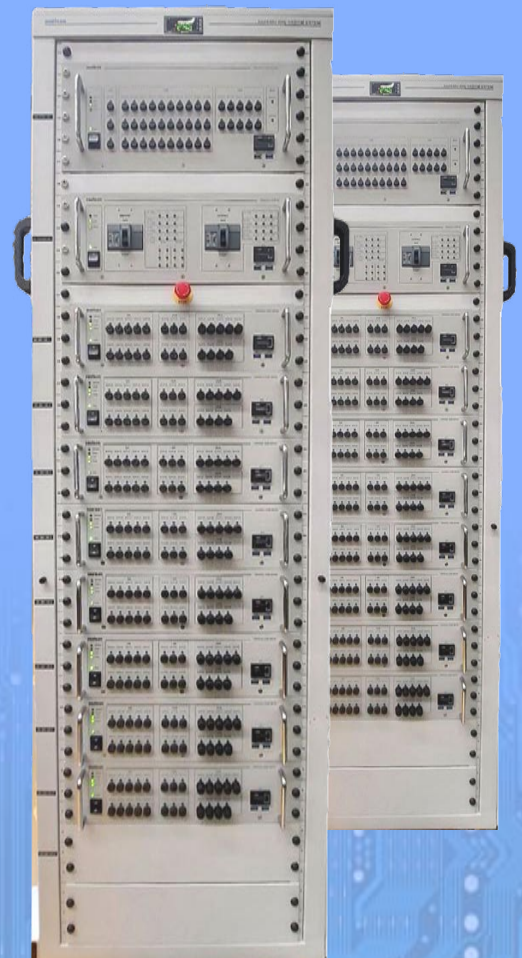


SENDEF

SGDB Series

Programmable AC/DC Power Distribution Units

- Software controlled
- TCP/IP connection
- Long term data acquisition
- Current limiting with cutoff and warn options
- 19" Rack Mount



SENDEF SGDB Series Power Distribution Units (PDU) are designed and manufactured for use in industrial automation and automatic test systems. PDUs are completely software controlled. Current and voltage measurements are made with high precision for all output channels. Current limit can be determined for each channel. When the specified limit current is reached, it can be preferred to turn-off the channel automatically or keep it open and warn the user.

These Units are designed as solid state in modular structure and in BPS configuration. Each 5/6 channel is controlled by 1 microprocessor. Therefore, when a channel has reached the set limit value, programmed reaction is performed in a short time around 10 microseconds.

The unit's main processor continuously monitors all channels and communications with submodules during normal operation. In this way, if a situation that cannot be controlled due to any malfunction (component, etc.) occurs, the input voltage is isolated from the output very quickly. This isolation is provided by high capacity circuit breaker(s) placed at the input.

This isolation mechanism can also be triggered both by the physical Emergency Stop Button and the soft-button on the PDU Manager software. More than one PDU can be controlled with a single Emergency Stop Button by making a chain connection with the Emergency Stop Connector on the unit. In addition, each output channel is also protected by a thermal fuse.

IP address and similar basic settings can be made when necessary, via the Serial Interfaces on the front panel of the unit. In addition, embedded software updates can also be made with these interfaces, and low level detailed information is obtained about the status of unit's subcomponents when necessary. PDU tests itself during startup. These test stages can also be monitored via those serial interfaces.

The front panel also includes a time counter that shows how long the unit has been active. Besides, the LED indicators for; input voltage, network connection, data communication and erroneous situations, are also on the front panel. There are also output LED indicators which are directly connected to each output channel.

With the PDU Manager software supplied with the unit, the output channels of one or more PDUs can be included in different turn-on/off scenarios. With the 4-level scenario structure, many channels and sub-scenarios can be created/included within each other.

PDU Manager software keeps detailed measurement records at 1/3 seconds intervals as well as the turn-on/off times of channels. Thanks to this data collection capability, it is possible to retrospectively examine how much the systems fed from the PDU, draw current at any given moment. For more detailed information about the PDU Manager software, please see the PDU Manager section of this document.

Features

- *SGDB Series 28VDC/270VDC and AC115/380 Power Distribution Units can work fully integrated*
- *SGDB Series can work integrated with iPDU Series Power Distribution Units and iPSU Series Power Supplies*
- *Management and long-term data collection with PDU Manager*
- *10 Microseconds current limit detection and cut-off*
- *1% measurement accuracy*
- *Capacity dimensioning owing to modular structure*
- *19" Rack mount*

SGDB-28DC-330-25



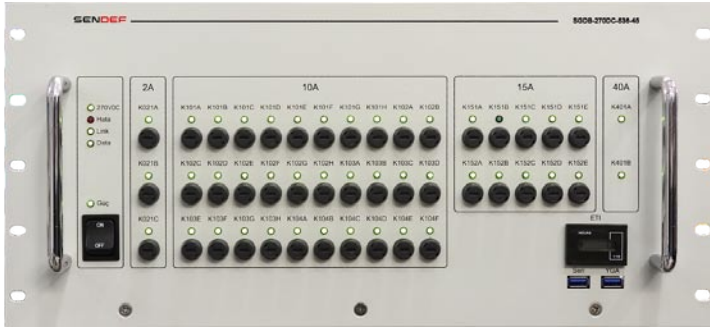
PDU		
1. Input Voltage	V	19.5-30VDC
2. Switching Capacity	A	330 (Upto 400 amps depending on the configuration)
3. Output Channels	---	25
4. Output Channel Currents	A	5A/10 Channels 10A/6 Channels 20A/5 Channels 30A/4 Channels
5. Total Power	W	10.000
6. Measurement Accuracy	%	1 (at max value of channel)
7. Current Limit Response Time	µS	~10
8. Output Connectors	---	MIL-DTL-5015
9. Input Connectors	---	9 Pole Terminal Block
10. Aux Power Input	V	85-265VAC
11. Protection Contactor Interrupt Current	A	500
12. LAN	Mbit	10/100
13. Serial Communication	---	USB 2.0
14. Cooling	---	Convection
15. Dimensions	mm	482(W) x 133(H) x 600(D)

The unit supports 15 LP (up to 10 amps) and 10 HP (up to 30 amps) output channels and can be ordered in different configurations according to user requirements. For example:

- 25x10A, a total of 250A
- 10x5A, 5x10A, 5x20A, 5x30A, a total of 350A
- 15x10A, 10x20A, a total of 350A
- 15x10A, 5x20A, 5x30A a total of 400A,

are some of the alternative configurations.

The unit has also high/low voltage protection. Levels are determined at the production stage in line with user demand.



PDU		
1. Input Voltage	V	240-300VDC
2. Switching Capacity	A	536
3. Output Channels	---	45
4. Output Channel Currents	A	2A/3 Channels 10A/30 Channels 15A/10 Channels 40A/2 Ka Channels nal
5. Total Power	kW	161
6. Measurement Accuracy	%	1 (at max value of channel)
7. Current Limit Response Time	μS	~10
8. Output Connectors	---	MIL-DTL-5015
9. Input Connectors	---	9 Pole Terminal Block
10. Aux Power Input	V	85-265VAC
11. Protection Contactor Interrupt Current	A	600
12. LAN	Mbit	10/100
13. Serial Communication	---	USB 2.0
14. Cooling	---	Forced Air Cooling
15. Dimensions	mm	482(W) x 222(H) x 600(D)

The unit has also high/low voltage protection. Levels are determined at the production stage in line with user demand.



PDU		
1. Input Voltage V1: V2:	V	380VAC 50Hz 115VAC 400Hz
2. Switching Capacity	A	768
3. Output Channels	---	18
4. Output Channel Currents	A	16A/220V 50Hz 1~ /12 Channels 32A/380V 50Hz 3~ / 3 Channels 32A/115V 400Hz 3~ /3 Channels
5. Total Power	kW	185
6. Measurement Accuracy	%	1 (at max value of channel)
7. Current Limit Response Time	mS	~50
8. Output Connectors	---	MIL-DTL-5015
9. Input Connectors	---	5+5 Pole Terminal Block
10. Aux Power Input	V	85-265VAC
11. LAN	Mbit	10/100
12. Serial Communication	---	USB 2.0
13. Cooling	---	Convection
14. Dimensions	mm	482(W) x 177(H) x 600(D)

SGDB-28DC-1200-25 High Power



PDU		
1. Input Voltage	V	19.5-30VDC
2. Switching Capacity	A	1190
3. Output Channels	---	25
4. Output Channel Currents	A	40A/15 Channels 50A/4 Channels 60A/3 Channels 70A/3 Channels
5. Total Power	W	33320
6. Measurement Accuracy	%	1 (at max value of channel)
7. Current Limit Response Time	μS	~10
8. Output Connectors	---	MIL-DTL-5015
9. Input Connectors	---	BusBar
10. Aux Power Input	V	85-265VAC
11. Protection Contactor Interrupt Current	A	600 x2
12. LAN	Mbit	10/100
13. Serial Communication	---	USB 2.0
14. Cooling	---	Forced Air Cooling
15. Dimensions	mm	482(W) x 266(H) x 600(D)

The unit has also high/low voltage protection. Levels are determined at the production stage in line with user demand.

SENDEF

iPSU Series Constant Voltage Programmable DC Power Supplies

- Software Controlled
- IP connectivity with SCPI support
- Touch Screen TFT LCD for monitoring and manual operation
- Long term data acquisition
- Current limiting function with cutoff and warn options
- 19" Rack Mount (Full/Half Rack) / Bench top
- Single/Multi Channel options



SENDEF iPSU series Power Supplies are constant voltage, 1-4 channel, software controlled, high-tech and cost-effective solutions, developed for use in industrial automation and automatic test systems.

Output channel(s) can be monitored/managed via SCPI or PDU Manager software as well as the touch screen or buttons on the front panel. With SCPI, users can quickly integrate iPSU Power Supplies into their environment. At the same time, PDU Manager software enable users to manage, iPSU Power Supplies, iPDU and SGDB Power Distribution Units from a single point.

The turn-on/off times of the channels, current limits and what to do when the limit is reached can be configured and monitored remotely.

Long-term data acquisition with both the SCPI interface and the PDU Manager software.

The TFT touch screen on the front panel provides an environment where all the operational activities such as management, configuration and monitoring can be carried out quickly.*¹

The current and voltage readback accuracy of iPSU Series Power Supplies is 0.05%.

Features

- *DC constant voltage*
- *1-4 output channels*
- *Manual/Software controlled*
- *SCPI supported IP connection*
- *Multifunctional TFT touch screen* *¹
- *Long-term data acquisition with SCPI and PDU Manager software*
- *Adjustable current limit for each channel with “Cut” and “Warn-Continue” options*
- *Sequential turn-on/off in multi-channel models (0.1 second resolution)*
- *Current and voltage measurement for each channel (0.05% accuracy)*
- *Wide input voltage range (85-265VAC)*
- *Local/Remote management option*
- *Last settings memory*
- *19” Rack mount/Desktop (full/half rack depending on model)*
- *Input/output indicators*
- *PDU Manager Software*

All features of the 4 Channel 48VDC power supply (iPSU-M60-48-4C) are given below as example.

**¹ Touch Screen is available on multi-channel models*

→Specifications and features mentioned here may be mutually exclusive and may change according to the configuration. Please check before ordering.

SENDEF™ and *iPDU* are Trade Marks of Sendef Savunma Inc.



48VDC 3kW, 4 independent channels

4.3" Dokunmatik Ekran

Users can perform management, configuration, monitoring and similar operations using the multi-function touch display.

The screenshots illustrate the following interface features:

- Monitoring Dashboard:** Displays real-time voltage and current for all four channels (C1-C4). C1 and C2 are 'On', while C3 and C4 are 'Off'. Values include 48.008V and 9.001A for C1, and 48.008V and 9.221A for C2.
- Channel Detail View:** Shows a close-up of Channel 2 (C2) with 'On' status, 48.008V, 9.328A, and 447.818W. It also shows limits (10.00A) and action settings (Warn).
- Waveform Graph:** Displays a graph for Channel 1 (C1) showing current over time. The graph shows a fluctuating current with a peak of 6.225A. The x-axis is labeled '1 Sec/Div'.
- Configuration Menu:** 'Set Current Limits and Action' for Channel 1, showing a limit of 9.88A and options for 'CutOff' or 'Warn&Cnt'.
- Delay Configuration:** 'Set Delay Times for Sequential Turn-On/Off' for Channel 1, showing 'On Delay' and 'Off Delay' both set to 999.9s.
- Auto Run Settings:** 'Auto Run' configuration showing 'Turn-On Delays' and 'Turn-Off Delays' for all channels (C1-C4) set to 999.9s.

Specifications (iPSU-M60-48-4C)

OUTPUT RATING		
1. Rated output voltage	V	48
2. Total rated output current	A	60
3. Number of output channels	---	4
4. Rated output current per channel	A	18A/Ch1&Ch2, 12A/Ch3&Ch4
5. Rated output power(*1)	W	3200

INPUT CHARACTERISTICS		
1. Input voltage/freq. (*2)	V	85~265VAC, continuous, 47~63Hz, Single Phase
2. Maximum Input current at 100% load (100/200 VAC)	A	27A/14A
3. Power Factor (Typ)	---	0.98 @ 100VAC 0.94 @ 200VAC, rated output power.
4. Efficiency at 100 Vac/200VAC, rated output (*3)	%	81/83
5. Inrush current	A	80A

CONSTANT VOLTAGE		
1. Max. Line regulation	---	0.02% of rated output voltage
2. Max. Load regulation	---	0.02% of rated output voltage +2mV
3. Ripple and noise (p-p, 20MHz)(*4)(*5)	mV	40mV max
4. Ripple r.m.s. 5Hz~1MHz (*3)(*4)	mV	15mV
5. Temperature coefficient	%/°C	0.02%/°C
6. Temperature stability	---	0.02% of rated Vout
7. Remote sense compensation/wire	V	0.3
8. Transient response time	mS	Time for output voltage to recover within 0.5% of its rated output for a load change 10~90% of rated output current. Output set-point: 10~100%, Local sense. Less than 8mS.
9. Start up delay	Sec	Less than 4 Sec
10. Hold-up time	mS	20ms typical, rated output power

PROTECTIVE FUNCTIONS		
1. Over Current Protection	---	Programmable current limit. Over 10A switch channel OFF and ON to reset protection
2. Over-voltage protection (OVP)	---	Output shut-down. Reset by AC input recycle

READBACK		
1. Voltage readback accuracy	%	0.05% at 48V
2. Current readback accuracy	%	0.05% at 10A (channel max load)
ÇIKIŞ KARAKTERİSTİKLERİ		
1. Çıkış gerilimi	V	48
2. Toplam çıkış akımı	A	60
3. Çıkış kanal sayısı	---	4
4. Kanallara göre çıkış akımları	A	18A/Ch1&Ch2, 12A/Ch3&Ch4
5. Toplam güç(*1)	W	3200

Specifications (iPSU-M60-48-4C) (cont.)

FRONT PANEL		
1.Front Panel Buttons Indications	---	Output channel ON/OF push buttons and status leds
2.Touch Screen Display	---	Output channel ON/OFF
	---	Output voltage by channel
	---	Output current by channel
	---	Current Limit and limit behavior adjustment
	---	Sequential On/Off timer adjustment
	---	Zoom into preferred channel
	---	Live current graph with 1/10, 1, 10 seconds resolution
	---	IP network parameter adjustment

ENVIRONMENTAL CONDITIONS		
1.Operating temperature	---	-10~60°C
2.Storage temperature	---	-30~85°C
3.Operating humidity	%	20~90% RH (no condensation).
4.Storage humidity	%	10~95% RH (no condensation).
5.Altitude	---	Operating: 2000m

MECHANICAL		
1.Cooling	---	Forced air cooling by internal fans. Air flow direction: from sides to power supply rear
2.Weight	kg	22kg
3.Dimensions (WxHxD)	mm	428 x 133 x 556 (Without handles, connectors and busbars)

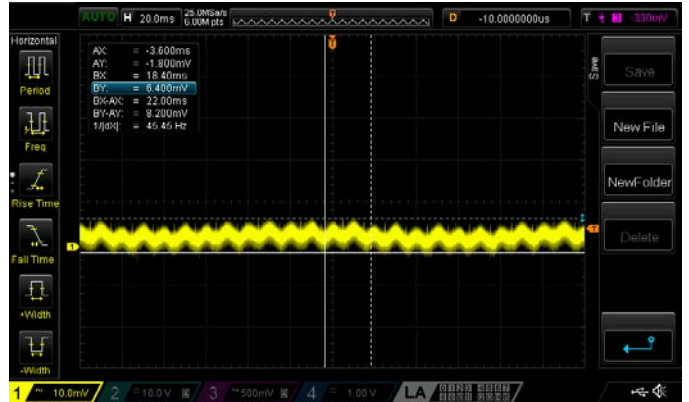
SAFETY/EMC		
1. Applicable standards: Safety	---	IEC 62368-1
1.2. Withstand voltage	VAC	Output to ground 500 for 1 minute, Input to ground 2,000, Input to output 2,000
1.3. Insulation resistance	MOhm	>100 at 25°C, 70%RH & 500Vdc
2. Conducted emmission	---	EN55032-B
3.Radiated emission	---	EN55032-B
4. EMC compliance	---	
4.1. ESD	---	EN61000-4-2, Air ± 8kV and contact ± 4kV
4.2. Radiated Susceptibility	---	EN61000-4-3, 80M -1GHz: 10V/m , 1.4 - 2.0GHz: 3V/m, 2.0 - 2.7GHz: 1V/m
4.3. Electrical Fast Transient Burst	---	EN61000-4-4, ± 2kV
4.4. Surge	---	EN61000-4-5, Normal ± 2kV, Common ± 4kV
4.5. Conducted Susceptibility	---	EN61000-4-6, 10Vrms
4.6. Magnetic Fields	---	EN61000-4-8, 30A/m

- *1. Total output power is limited to 2880 Watts by software. 3200 Watts output is achievable in air conditioned environments.
- *2. For cases where conformance to various safety standards (UL, IEC etc.) is required, to be described as 100-240Vac (50/60Hz).
- *3. At 100/200V input voltage and maximum output power.
- *4. The ripple is measured at 100% output current.
- *5. Measured with JEITA RC-9131A (1:1) probe.

Ripple

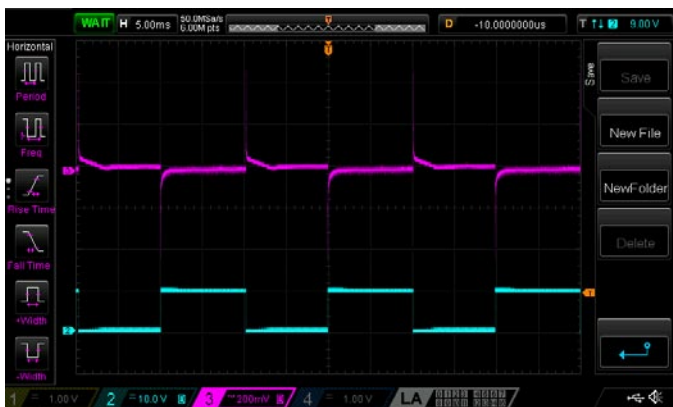


Channels 1/2

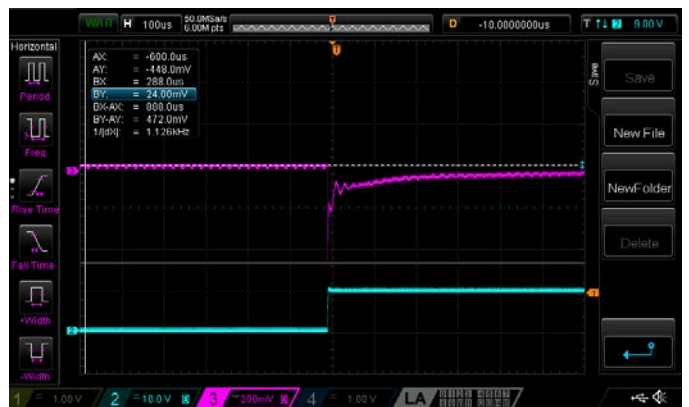


Channels 3/4

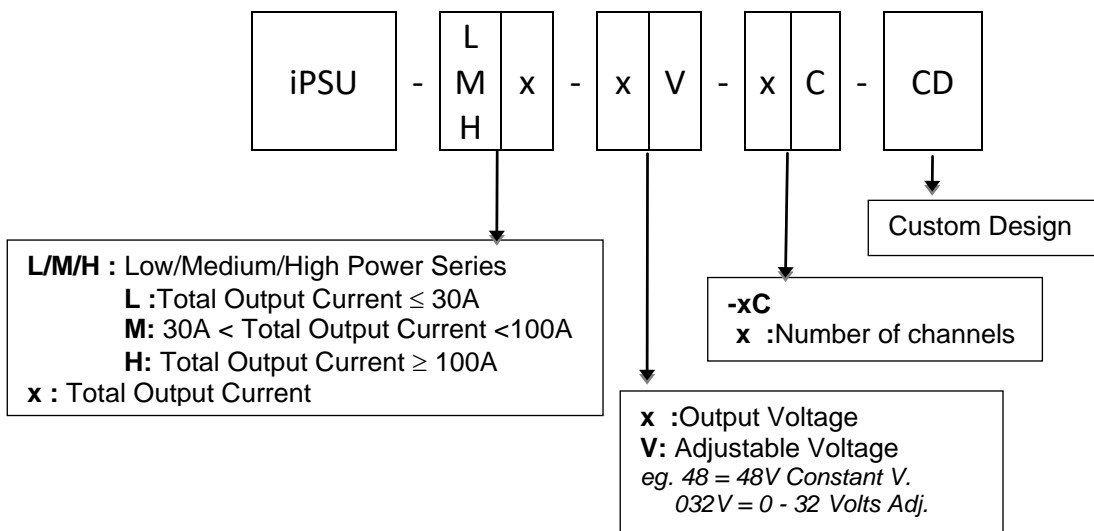
Transient Response



All Channels



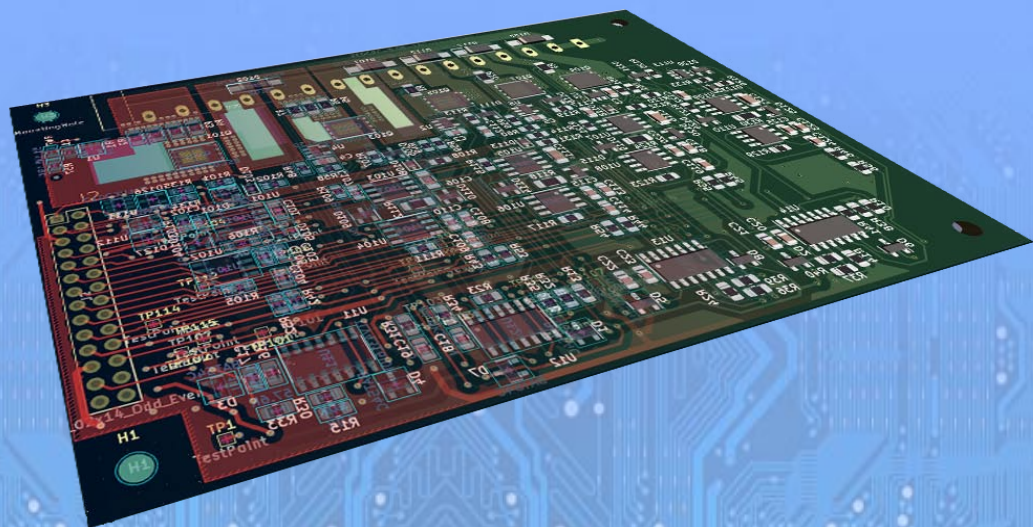
iPSU Series Power Supplies Part Number Guide



SENDEF

SATB Series
Programmable Generic ATE Test Boards

Fully Programmable Generic Architecture
SCPI over USB
Power Switching with Current Measurement
SPI, I2C, PWM, GPIO and more



SENDEF SATB Boards are fully programmable, generic ATE test boards designed to meet the power switching and digital control signal requirements of units to be tested for function and life in Automatic Test Systems. SATB is controlled by SCPI protocol via USB connection. SATB can send the desired signals to the systems tested with SPI and I2C. The boards also have PWM and GPIO outputs. It can be ordered in various capacities, from 1 to 16 channels, according to user needs.

By using the libraries provided with the board, users can program their SATB boards easily, according to their own infrastructure and needs.

SATB boards are controlled by SCPI over USB.

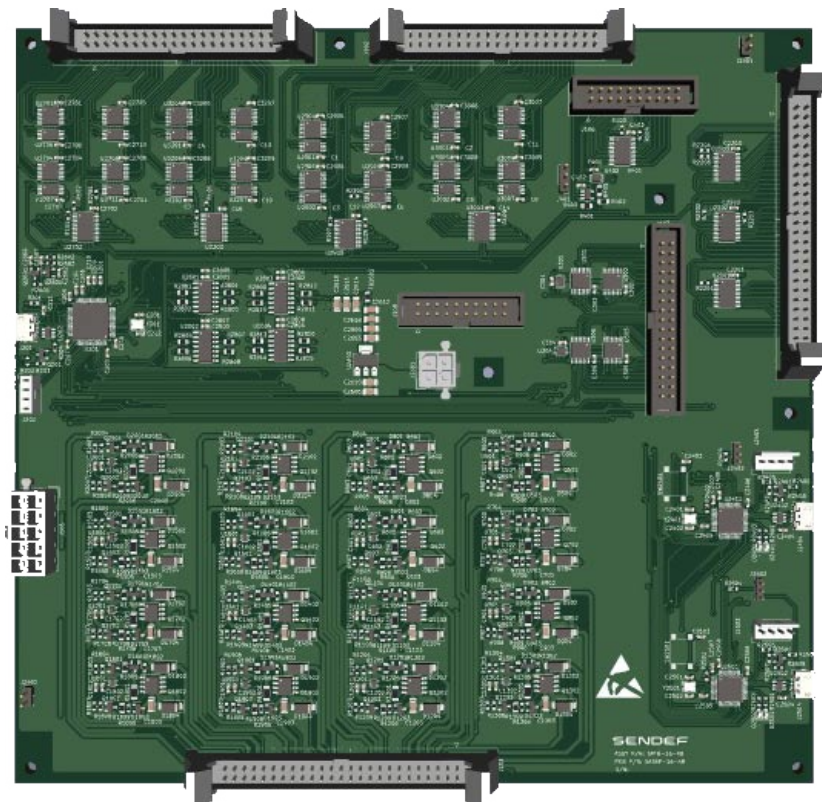
Features

- *Fully programmable generic architecture*
- *Controlled via SCPI over USB*
- *Easily programmable to suit all kinds of infrastructure and needs with the included libraries*
- *Configurable PWM outputs with 10ns phase difference*
- *Power switching and current measurement*
- *Current measurement with 1mA precision*
- *48 GPIO (GPIO numbers vary depending on the model)*
- *SPI and I2C outputs*

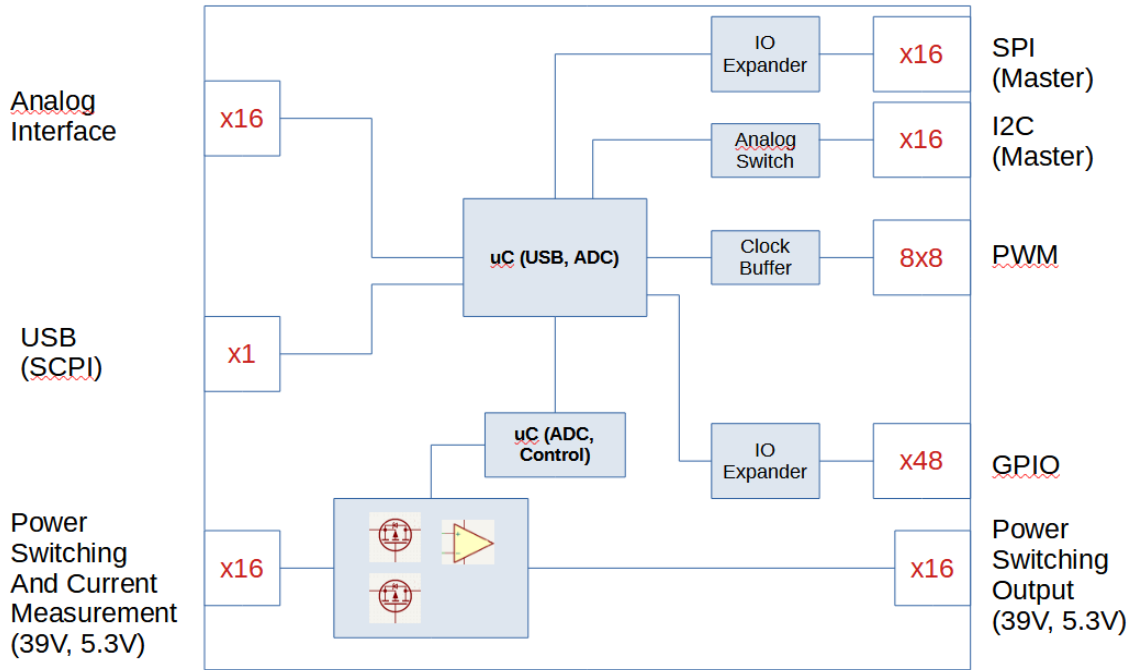
SATB-16

SATB-16 has 16 channels 60V dual channel switching capability, also has the necessary hardware to read the channel current with high precision.

The board comprise 12-bit ADCs to convert the signal applied to 16 analog inputs into digital.



Block Schema



Specifications

Feature	# of Channels	Description
I2C	16	Speed: 100k, 400k, 1M, Configured through SCPI Output Level: 0/3.3V
SPI	16	Speed: 40, 20, 10, 5, 2.5, 1.25, 0.625, 0.3125 Mbps, Configured through SCPI Output Level: 0/3.3V
PWM	8x8	8 main channels. Each channel is multiplexed by 8 Max Speed: 10 Mbps. 8 main channels can be configured by 10ns resolution phase shift Output Level: 0/3.3V
Power Switching / Current Measurement	2x16	Dual 16 channel switching Current: the first of the dual 1.6A, the second 0.3A Current Measurement Precision: 1mA (current is measured for the first pairs of dual channels)
GPIO	48	48 x bi-directional GPIO Output Level: 0/3.3V
Analog Measurement	16	16 x 12-bit ADC Input Level: 0/3.3V

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SENDEF

PDU Manager Software

Full Control over Sendef Power Distribution Units and Power Supplies from a Single Point
Long Term Data Acquisition
Full Automation



PDU Manager is a management software developed for Sendef Power Distribution Units and Power Supplies. It is possible to manage one or more PDUs and Power Supplies from a single computer. In this way, combined and fully automatic power management and control becomes possible.

PDU Manager records the current and voltage measurement information of each channel in all units registered to it, 3 times per second. In this way, users can make power planning by recording and observing the long-term current profiles of the devices fed through these channels.

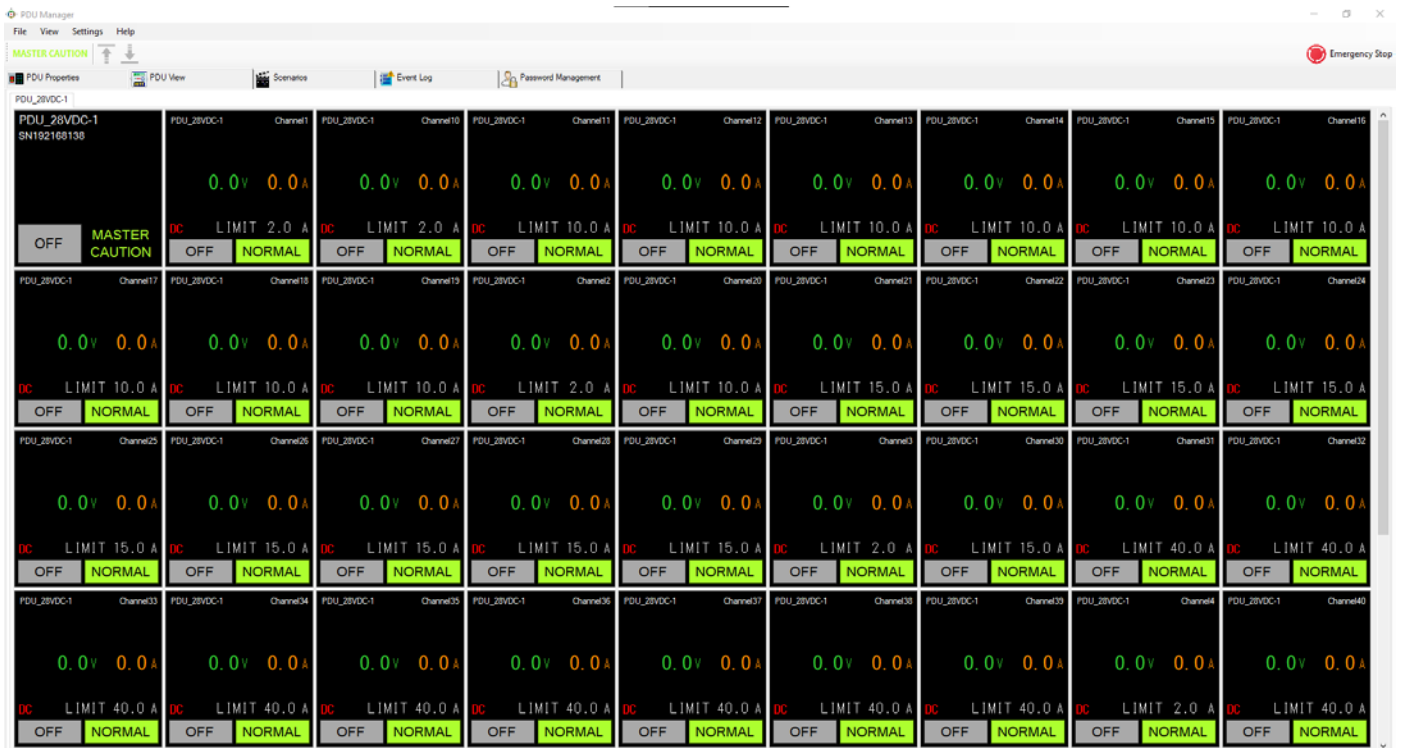
Thanks to 4-level, nested on and off scenarios, the user can program in real time in what order and when to turn on and off each connected device. Each scenario can be run in a separate window. In this way, power usage of different areas can be monitored on one or more screens, if desired.

PDU Manager offers two levels of access. Users with administrative authority can introduce and delete new Power Distribution Units and Power Supplies to the system, create new scenarios and perform all other operational operations. Operators can turn on and off channels in connected units, run scenarios created by the administrator, and view measurement records.

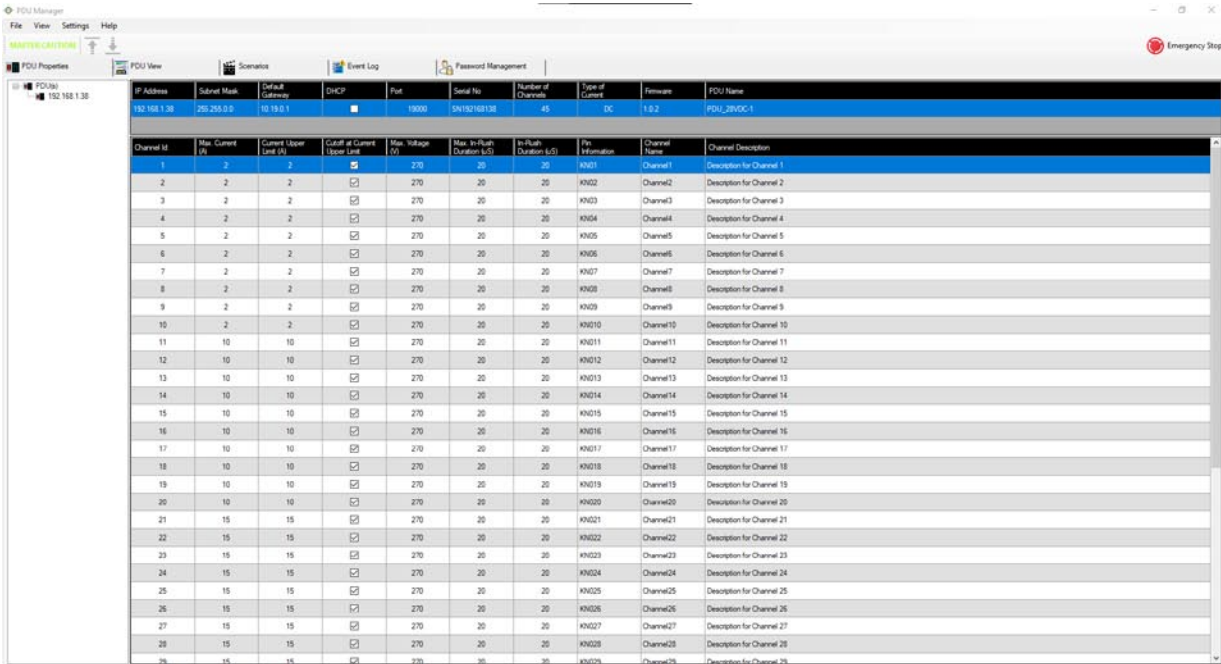
Units and channels can be assigned names in the software. Additionally, there are also description fields on the Configuration Window, to enter more detail. Monitoring the units fed by Sendef Power Distribution Units and Power Supplies in this way provides additional ease of operation.

PDU Manager - Control Window

It is possible to continuously monitor all desired output channels on this window, which can be created separately for each scenario. In addition to current and voltage measurements, the PDU/PS name, the channel name given by the user, and the channel limit values are displayed instantly. Units can be reset one by one via this screen, or all channels on all units defined in the software can be interrupted at the same time via the "Emergency Stop" soft button in the upper right corner.

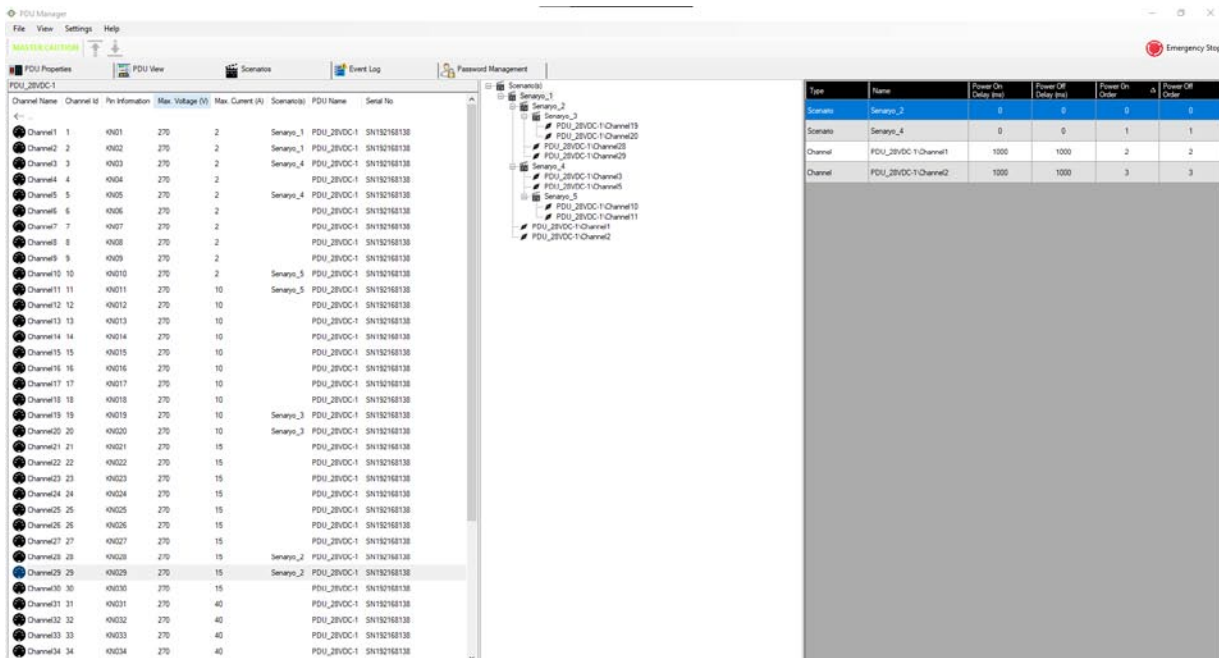


This is the screen where new units are added and removed, names are given to units/channels, descriptions for each channel, limit values and the action to be shown when the limit is reached are defined.



PDU Manager - Scenario Management Window

On-off scenarios are defined on the scenario management window. Scenarios can be defined in 4 levels. In other words, any scenario may contain other scenarios as sub-scenarios. A previously defined on/off scenario for any channel of any unit can be included under the same scenario. The user can energize the units to be included in the automation in any order he wishes by classifying them as units, racks, clusters, etc.



PDU Manager - Measurements Log Window

PDU Manager takes current and voltage measurements on a channel basis from the units defined to it, 3 times per second, and saves them to its local disk. In this way, users can have information about the power characteristics of their own units. Additionally, in case of an anomaly, retrospective analysis can be made through these log files. In both test systems and automation environments, this data always offers important opportunities to the user in planning and solving problems.

Index	Type	Date / Time Generated	Source	Message
19643	Information	30/11/2022 15:40:14	PDU	9@Pdu28_751631: Turning Off
19642	Information	30/11/2022 15:40:13	PDU	9@Pdu28_751631: Turning Off
19641	Information	30/11/2022 15:39:33	PDU	9@Pdu28_751631: Turned On
19640	Information	30/11/2022 15:39:33	PDU	9@Pdu28_751631: Turning On
15639	SuccessAudit	30/11/2022 15:36:19	PDU Manager	Administrator logged in
19638	Information	30/11/2022 15:36:19	PDU Manager	PDU Manager started.
19637	Information	30/11/2022 15:35:51	PDU Manager	PDU Manager stopped.
19636	Information	30/11/2022 15:32:20	PDU	9@Pdu28_751631: Turned Off
19635	Information	30/11/2022 15:32:20	PDU	9@Pdu28_751631: Turning Off
19634	Information	30/11/2022 15:32:19	PDU	10@Pdu28_751631: Turned Off
19633	Information	30/11/2022 15:32:19	PDU	10@Pdu28_751631: Turning Off
19632	Information	30/11/2022 15:32:08	PDU	9@Pdu28_751631: Turned On
19631	Information	30/11/2022 15:32:08	PDU	9@Pdu28_751631: Turning On
19630	Information	30/11/2022 15:32:07	PDU	10@Pdu28_751631: Turned On
19629	Information	30/11/2022 15:32:07	PDU	10@Pdu28_751631: Turning On
19628	Information	30/11/2022 15:31:27	PDU	10@Pdu28_751631: Turned Off
19627	Information	30/11/2022 15:31:26	PDU	10@Pdu28_751631: Turning Off
19626	Information	30/11/2022 15:31:25	PDU	10@Pdu28_751631: Turned On
19625	Information	30/11/2022 15:31:25	PDU	10@Pdu28_751631: Turning On
19624	Information	30/11/2022 15:24:29	PDU	16@Pdu28_751631: Turned On
19623	Information	30/11/2022 15:24:29	PDU	16@Pdu28_751631: Turning On
19622	Information	30/11/2022 15:24:28	PDU	11@Pdu28_751631: Turned On
19621	Information	30/11/2022 15:24:28	PDU	11@Pdu28_751631: Turning On
19620	Information	30/11/2022 15:24:27	PDU	6@Pdu28_751631: Turned On
19619	Information	30/11/2022 15:24:27	PDU	6@Pdu28_751631: Turning On
19618	Information	30/11/2022 15:24:26	PDU	18@Pdu28_751631: Turned On
19617	Information	30/11/2022 15:24:26	PDU	18@Pdu28_751631: Turning On
19616	Information	30/11/2022 15:24:24	PDU	22@Pdu28_751631: Turned On
19615	Information	30/11/2022 15:24:24	PDU	22@Pdu28_751631: Turning On
19614	Information	30/11/2022 15:24:24	PDU	17@Pdu28_751631: Turned On
19613	Information	30/11/2022 15:24:24	PDU	17@Pdu28_751631: Turning On
19612	Information	30/11/2022 15:24:23	PDU	12@Pdu28_751631: Turned On

Quality and Configuration Management

ISO 9001:2015

Quality and Configuration Management

Sendef obtained got ISO 9001:2015 quality certificate and fulfils all the documented procedures without exeption while manufacturing its products

In addition, an AS9100 compliant system is used to protect and track the functional and physical properties of the produced units/PCBs throughout their life cycle.

The system is implemented by technical and administrative units within Sendef, without exception.

All details of each unit produced, changes made during production or at user facilities, are recorded throughout the life cycle of the product.

Such traceability provides:

- Delivering the same products in every order,
- Meeting the remote maintenance and support needs of delivered products quickly and accurately.
- Ensuring that quick and accurate changes can be made to the product whenever necessary

SERTİFİKA

CERTIFICATE

KALİTE YÖNETİMİ / *QUALITY MANAGEMENT*
SENDEF SAVUNMA ANONİM ŞİRKETİ

kuruluşunun,
company,
Macun Mah. 177 Cad. No: 28 İç Kapı No: 67
Yenimahalle / Ankara / Türkiye
adreslerinde,
at address,

KENDİNE ÖZEL FONKSİYONU OLAN ELEKTRİKLİ MAKİNE VE CİHAZLARIN
İMALATI, YÜKLÜ ELEKTRONİK KART İMALATI, TELEKOMÜNİKASYON
ŞEBEKE VE AĞLARININ BAKIM ONARIMI
*MANUFACTURING OF ELECTRICAL MACHINES AND DEVICES WITH SPECIAL
FUNCTIONS, MANUFACTURING OF INSTALLED ELECTRONIC CARDS, MAINTENANCE
AND REPAIR OF TELECOMMUNICATION NETWORKS*
kapsamında
at scope

kalite yönetim sistemi yürürlüğe koyduğu,
perform the quality management system,
ISO 9001: 2015
standard taleplerinin yerine getirilği belirlenmiştir.
the complex of the standard was determined.

İlk Yayın Tarihi / *Date First Registered* : 05.07.2023
Yayın Tarihi / *Date Certificate Issued* : 05.07.2023
Geçerlilik Periyodu / *Period of Registration* : 3 yıl / years
Geçerlilik Tarihi / *Date Certificate Expires* : 04.07.2024
Sertifika Numarası / *Certificate No* : 01/13980/01



KALİTE YÖNETİMİ SİSTEMİ
TS EN ISO 9001:2015
AB - 2008 - YS



TÜRKAK BDS NO
YS-6E55-5E01

Onay:
Approved by:





Bu sertifikanın geçerliliği, yılda en az bir kez yapılacak gözlem denetiminin başarıya geçmesine bağlıdır. Bu durumda belge yeniden düzenlenecektir.
The Validity of this certificate, subject to successful completion of surveillance audit which will take place at least once a year. In this case, the document will be revised.

ASB Uluslararası Belgelendirme Gözetim Denetim ve Eğitim Hiz. Ltd. Şti. / ASB International Certification Surveillance, Auditing and Training Services Ltd. Company
Yatılıca Mh. Akalın Sok. Saray Residence No:70 Daire:13 Kat:08 Ümrangazı - İstanbul / TÜRKİYE. Tel: +90 212 526 10 04. Faks: +90 212 526 20 91 e-mail: bilgi@asbcert.com.tr
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The Validity shall remain in force as long as the corporation follows instructions of ASB. Certificates status can be checked at www.asbcert.com.tr



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SENDEF

References

aselsan

SENDEF is a supplier of Aselsan. iPDU, iPSU, SGDB and SATB series units, which are designed and manufactured by SENDEF, have been used in Aselsan's domestic and international projects since 2020.

SENDEF

Contact

Sendef Savunma Inc.

Macun Mahallesi 177. Cad. No:28/67 Yenimahalle 06105 Ankara Türkiye

0312 544 0220

contact@sendef.com.tr

www.sendef.com.tr