

# PDU34A

## Datasheet



**The PDU34A is a high-performance solid state power distribution unit with a total of 34 powered output channels and maximum current capacity of 200A.**

**This includes 10 flexible output drivers which may be configured as high side, low side, or high side PWM, with the ability to soft start electrical loads with closed loop current limitation.**

**Using logical or numerical inputs from its 16 analogue inputs or from any of 3 CAN buses the PDU34A is calibrated using a clear graphical interface with full logic simulation ability and live monitoring.**

**The PDU34A is able to operate in a low power standby state, drawing <math><2\text{mA}</math>, with configurable activation based on physical or CAN input.**

**Additionally, the PDU34A may be paired with a Life Racing ECU to expand input and output functionality through the 'slave-link' feature.**

**The PDU34A is available as 12V or 24V variants as detailed in the 'Ordering Information' section.**

## Features:

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- Lightweight and small dimensions
- Schematic based calibration including logic simulation tool
- Numerical arithmetic including handling of analogue inputs
- Fully custom CAN across 3 buses including mux frames and retransmission (gateway), configured with the help of a graphical display and import/export tool
- Low power state woken on physical input, CAN activity, or specific CAN frame
- Optional I/O slaving to an LR ECU

## Outputs:

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- 34 main Power Outputs
  - 10 multifunction high side, low side, high side PWM (fixed 20kHz) outputs (20A continuous, soft-start inrush limiting 40A, hard-start inrush 60A)
  - 20 high side outputs (20A continuous, hard-start inrush 60A)
  - 4 high side outputs (15A continuous, hard-start inrush 17.5A)
- Output linking ('teaming') to support very high current devices
- All outputs short circuit and thermally protected with multi-stage in-rush control
- Combined diagnostic output with reset input
- 128 scaleable CAN ('soft') outputs
- Custom datastream (CAN) – i.e. customisable channel current, channel state and device information

## Inputs:

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- 16 physical switch / analogue sensor inputs including software selectable 3k ohm pull-up resistors and 4x inputs capable of programmable "wake up" functionality
- Analogue inputs may be transformed into engineering units for use in schematic
- Dedicated wake pin
- 128 CAN 'soft' inputs with configurable scaling, validation and debounce time

## Interfaces:

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- 2x 100Mbit/s full duplex Ethernet (can be used as Ethernet switch)
- 3x CAN 2.0B – fully flexible
- *Option for galvanically isolated CAN bus (custom projects only)*
- *RS232C serial interface (custom projects only)*
- *LIN Bus (custom projects only)*

## Power Supply:

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- 6V to 20V input voltage (12V option) or 6V to 30V input voltage (24V option)
- Dedicated logic power input
- Regulated 5V sensor supply output with full circuit protection

## Sleep State:

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- Low power standby state with configurable wake options:
  - Wake by voltage signal (1.6mA)
  - Wake by any CAN activity (CAN1 only) (2mA)
  - Wake by specific CAN frame (two frames required, CAN1 only) (2mA)
  - Wake by CAN specific CAN frame with low latency (one frame required, CAN1 only) (10mA)

## ECU Slaving:

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- Allows a Life Racing ECU to “claim” unused pins across a dedicated CAN bus utilising the following PDU I/O:
- Outputs 1..10 with additional functionality including H-Bridge pairing and configurable PWM frequencies
- Low Outputs 11..14 with configurable PWM frequencies
- All 16 inputs, including 8 frequency capable (4 optionally bipolar), and all with software selectable 3k ohm pull-up resistors

## Physical:

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- 3 Deutsch Autosport connectors with a total of 87 pins
- Deutsch Autosport Power Stud
- Machined Aluminium enclosure
- 190x90x43mm (including connectors)
- 690 grams
- Operating Temperature -40C to +85C

## Ordering Information:

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Description	Part number
PDU34A	PDU-A03
PDU34A 24V	PDU-E07
PDU34A Connector Kit	CON-A10

## Wiring Information:

### Power Stud

Mating connector: ASD6141-S-N-C25

Pin	Gauge	Signal Name	Signal Notes
1	16-35mm <sup>2</sup>	+12V Supply	Positive battery supply

### Connector 1

Mating connector: AS620-16PN-HE

Pin	Gauge	Signal Name	Signal Notes
A	16AWG	Output 1	High Side, Low Side, High Side PWM (20kHz), Soft start 20A SLAVED: Half Bridge, Full Bridge paired with Output 2, Low Side, Variable frequency PWM
B	16AWG	Output 2	High Side, Low Side, High Side PWM (20kHz), Soft start 20A SLAVED: Half Bridge, Full Bridge paired with Output 1, Low Side, Variable frequency PWM
C	16AWG	Output 3	High Side, Low Side, High Side PWM (20kHz), Soft start 20A SLAVED: Half Bridge, Full Bridge paired with Output 4, Low Side, Variable frequency PWM
D	16AWG	Output 4	High Side, Low Side, High Side PWM (20kHz), Soft start 20A SLAVED: Half Bridge, Full Bridge paired with Output 3, Low Side, Variable frequency PWM
E	16AWG	Output 5	High Side, Low Side, High Side PWM (20kHz), Soft start 20A SLAVED: Half Bridge, Full Bridge paired with Output 6, Low Side, Variable frequency PWM
F	16AWG	Output 6	High Side, Low Side, High Side PWM (20kHz), Soft start 20A SLAVED: Half Bridge, Full Bridge paired with Output 5, Low Side, Variable frequency PWM
G	16AWG	Output 7	High Side, Low Side, High Side PWM (20kHz), Soft start 20A SLAVED: Half Bridge, Full Bridge paired with Output 8, Low Side, Variable frequency PWM
H	16AWG	Output 8	High Side, Low Side, High Side PWM (20kHz), Soft start 20A SLAVED: Half Bridge, Full Bridge paired with Output 7, Low Side, Variable frequency PWM
J	16AWG	Output 9	High Side, Low Side, High Side PWM (20kHz), Soft start 20A SLAVED: Half Bridge, Full Bridge paired with Output 10, Low Side, Variable frequency PWM
K	16AWG	Output 10	High Side, Low Side, High Side PWM (20kHz), Soft start 40A SLAVED: Half Bridge, Full Bridge paired with Output 9, Low Side, Variable frequency PWM
L	16AWG	Output 11	High Side 20A
M	16AWG	Output 12	High Side 20A
N	16AWG	Output 13	High Side 20A
P	16AWG	Output 14	High Side 20A
R	16AWG	Output 15	High Side 20A
S	16AWG	Power Ground	Negative battery supply

## Connector 2

Mating Connector: AS620-16PA-HE

Pin	Gauge	Signal Name	Signal Notes
A	16AWG	Output 16	High Side 20A
B	16AWG	Output 17	High Side 20A
C	16AWG	Output 18	High Side 20A
D	16AWG	Output 19	High Side 20A
E	16AWG	Output 20	High Side 20A
F	16AWG	Output 21	High Side 20A
G	16AWG	Output 22	High Side 20A
H	16AWG	Output 23	High Side 20A
J	16AWG	Output 24	High Side 20A
K	16AWG	Output 25	High Side 20A
L	16AWG	Output 26	High Side 20A
M	16AWG	Output 27	High Side 20A
N	16AWG	Output 28	High Side 20A
P	16AWG	Output 29	High Side 20A
R	16AWG	Output 30	High Side 20A
S	16AWG	Power Ground	Negative battery supply

## Connector 3

Mating Connector: AS616-35SN-HE

Pin	Gauge	Signal Name	Signal Notes
1	22AWG	INPUT #01	Analogue 0-5V, 3k $\Omega$ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, -5V to +5V, 3k $\Omega$ programmable pullup to 5V, variable frequency voltage thresholds
2	22AWG	INPUT #02	Analogue 0-5V, 3k $\Omega$ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, -5V to +5V, 3k $\Omega$ programmable pullup to 5V, variable frequency voltage thresholds
3	22AWG	INPUT #03	Analogue 0-5V, 3k $\Omega$ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, -5V to +5V, 3k $\Omega$ programmable pullup to 5V, variable frequency voltage thresholds
4	22AWG	INPUT #04	Analogue 0-5V, 3k $\Omega$ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, -5V to +5V, 3k $\Omega$ programmable pullup to 5V, variable frequency voltage thresholds
5	22AWG	INPUT #05	Analogue 0-5V, 3k $\Omega$ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, 3k $\Omega$ programmable pullup to 5V Fixed frequency voltage thresholds at 1.25 and 3.75V
6	22AWG	INPUT #06	Analogue 0-5V, 3k $\Omega$ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, 3k $\Omega$ programmable pullup to 5V Fixed frequency voltage thresholds at 1.25 and 3.75V
7	22AWG	INPUT #07	Analogue 0-5V, 3k $\Omega$ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, 3k $\Omega$ programmable pullup to 5V Fixed frequency voltage thresholds at 1.25 and 3.75V
8	22AWG	INPUT #08	Analogue 0-5V, 3k $\Omega$ programmable pullup to 5V SLAVED: Analogue or frequency; 0-5V, 3k $\Omega$ programmable pullup to 5V Fixed frequency voltage thresholds at 1.25 and 3.75V

## Connector 3

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Pin	Gauge	Signal Name	Signal Notes
9	22AWG	INPUT #09	Analogue 0-5V, 3kΩ programmable pullup to 5V
10	22AWG	INPUT #10	Analogue 0-5V, 3kΩ programmable pullup to 5V
11	22AWG	INPUT #11	Analogue 0-5V, 3kΩ programmable pullup to 5V
12	22AWG	INPUT #12	Analogue 0-5V, 3kΩ programmable pullup to 5V
13	22AWG	INPUT #13	Analogue 0-5V, 3kΩ programmable pullup to 5V, Wake <sup>(1)</sup>
14	22AWG	INPUT #14	Analogue 0-5V, 3kΩ programmable pullup to 5V, Wake <sup>(1)</sup>
15	22AWG	INPUT #15	Analogue 0-5V, 3kΩ programmable pullup to 5V, Wake <sup>(1)</sup>
16	22AWG	INPUT #16	Analogue 0-5V, 3kΩ programmable pullup to 5V, Wake <sup>(1)</sup>
17	22AWG	SENSOR GND	Protected sensor ground
18	22AWG	SENSOR GND	Protected sensor ground
19	22AWG	WAKEUP	Dedicated Wake <sup>(1)</sup>
20	22AWG	5V OUT	Regulated 5V sensor supply rail
21	22AWG	CAN #03 HI	CAN communication port 120Ω software selectable termination
22	22AWG	CAN #03 LO	CAN communication port 120Ω software selectable termination
23	22AWG	POWER GROUND	Negative battery supply
24	22AWG	12V OUT	Power stud voltage out
25	22AWG	LOGIC POWER IN	+12V Battery supply; recommended independent logic supply <0.5A
26	22AWG	Output 31a	High Side (pin share 37) 15A
27	22AWG	Output 32a	High Side (pin share 38) 15A
28	22AWG	Output 33a	High Side (pin share 39) 15A
29	22AWG	Output 34a	High Side (pin share 40) 15A
30	22AWG	LIN	NOT CURRENTLY IN USE
31	22AWG	CAN #02 HI	CAN communication port 120Ω software selectable termination ECU Slave - when paired with LR ECU (terminated)
32	22AWG	CAN #02 LO	CAN communication port 120Ω software selectable termination ECU Slave - when paired with LR ECU (terminated)
33	24AWG	ETHERNET2 RX+	Ethernet communication port 2
34	24AWG	ETHERNET2 RX-	Ethernet communication port 2
35	24AWG	ETHERNET2 TX+	Ethernet communication port 2
36	24AWG	ETHERNET2 TX-	Ethernet communication port 2
37	22AWG	Output 31b	High Side (pin share 26) 15A
38	22AWG	Output 32b	High Side (pin share 27) 15A
39	22AWG	Output 33b	High Side (pin share 28) 15A
40	22AWG	Output 34b	High Side (pin share 29) 15A
41	22AWG	WARNING AND RESET SW	Warning output for an LED to ground. Short to ground for manual reset.
42	22AWG	RS232 TX	RS232 transmit
43	22AWG	RS232 RX	RS232 receive
44	22AWG	COMMS GROUND	Protected communication ground
45	22AWG	CAN #01 HI	CAN communication port 120Ω software selectable termination
46	22AWG	CAN #01 LO	CAN communication port 120Ω software selectable termination

### Connector 3

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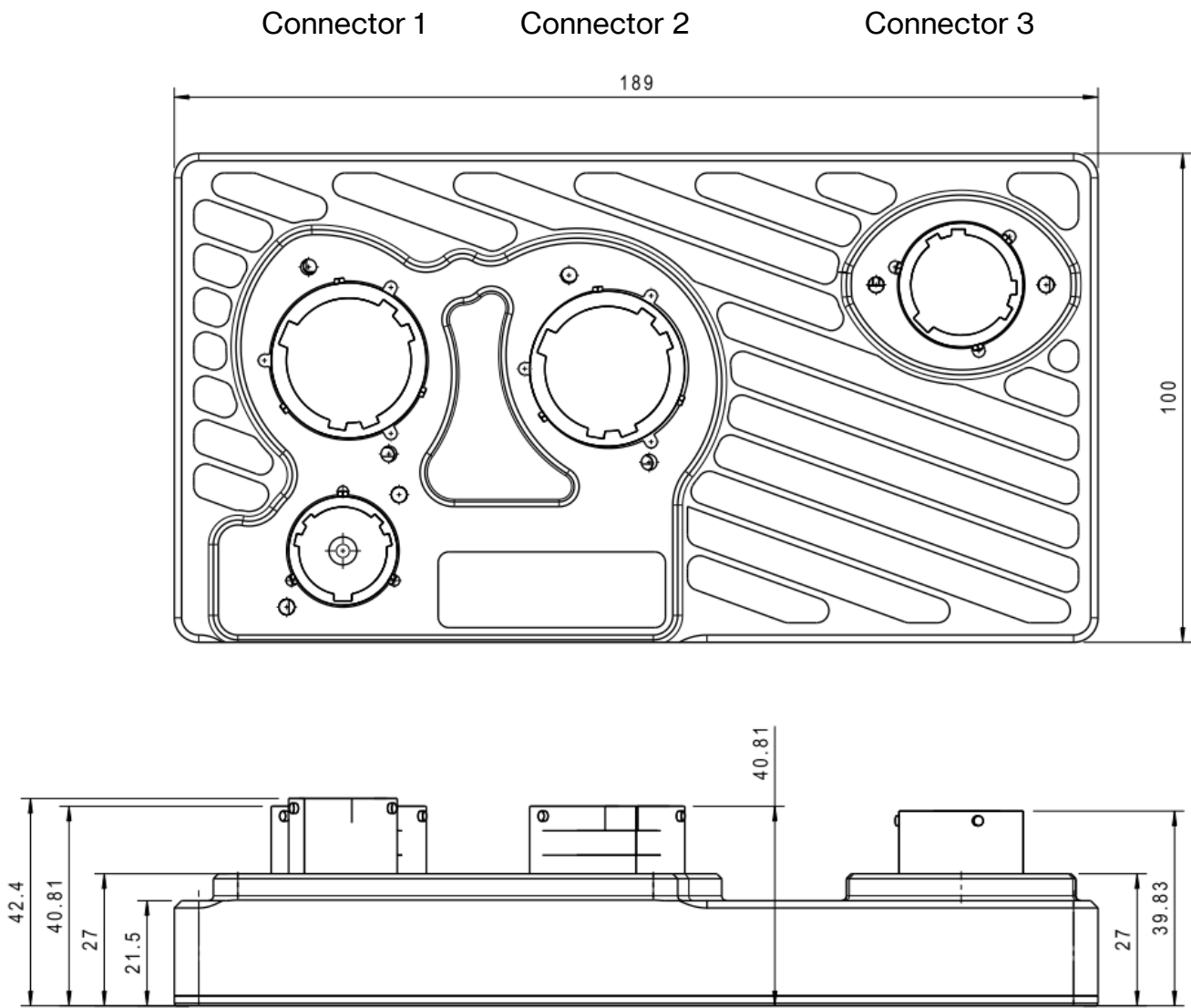
Pin	Gauge	Signal Name	Signal Notes
47	24AWG	ETHERNET1 RX+	Ethernet communication port 1
48	24AWG	ETHERNET1 RX-	Ethernet communication port 1
49	24AWG	ETHERNET1 TX+	Ethernet communication port 1
50	24AWG	ETHERNET1 TX-	Ethernet communication port 1
51	22AWG	DIGITAL GROUND	Protected digital ground
52	22AWG	POWER GROUND	Negative battery supply
53	22AWG	POWER GROUND	Negative battery supply
54	22AWG	POWER GROUND	Negative battery supply
55	22AWG	POWER GROUND	Negative battery supply

#### Footnotes:

<sup>(1)</sup>Can be calibrated to bring unit out of sleep mode when driven high.

## Dimensions:

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## Warranty and Servicing:

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- 1 year limited warranty when used within supplied specification.