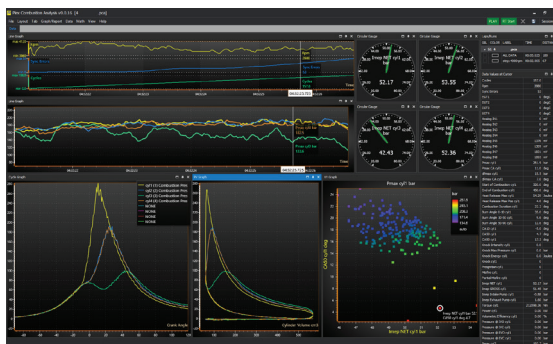


NEW PLEX PCA-2000+®

PORTABLE COMBUSTION ANALYSIS 2.0

Winner of "Data and Electronics Solution of the Year"



Description

Introducing a new, vastly improved iteration of our reputable PLEX PCA-2000® Combustion Analysis System.

The new PLEX PCA-2000plus®, which is now available for ordering, encapsulates our accumulated experience of more than a decade, in making highly versatile & intuitive portable Combustion Analysis Systems.

With fully re-designed electronics, expanded control & configuration options, enhanced functionality, and increased accuracy, the new system promises industry-leading features and capabilities at accessible pricing. Designed for any type of on-board/test-bed application, the new PCA-2000+® is suitable for Automotive, Motorcycle, Marine, Off-road or even UAV projects and compared to its predecessor, is available in upgradable versions with 4, 8 or 16 High-speed analog inputs for combustion, intake and exhaust pressure. Nevertheless, what sets the system apart is the latest PLEX PCA-WIN® 2.0 Data Analysis Software, which provides unmatched versatility, speed & customization, as well as the new PLEX Device Manager 2.0 configuration software, which offers expanded control and advanced options.

Key Hardware Features

- ▶ Ultra Compact & Light-weight (IP67) Logger
- ▶ Works with OEM crank triggers & Optical Encoders (60-2, 36-2, 36-1, 360ppr, 720ppr)
- ▶ Powerful Multi-core Processor
- ▶ Fully configurable CAN FD Rx & Tx
- ▶ Up to 16 High-speed Analog Inputs
- ▶ Up to 8 High-speed Digital Inputs
- ▶ Up to 8 Low-speed Analog/Digital Inputs
- ▶ Built-in 25Hz GNSS & 100Hz IMU modules
- ▶ Gigabit Ethernet
- ▶ 1GB built-in ultra-fast logging memory

Applications

- Automotive
- Motorcycle
- Trucks
- Marine
- Off-road
- UAVs

Technical Specifications

Inputs	
Analog/Digital 0-5V	4
Analog/Digital 0-16V	4
Thermocouple	4 Type K
High Speed Analog	4 / 8 / 16 (±2.5V to ±20V) Singled-Ended or Differential
High Speed Dig /Freq.	4 / 8 (5V/16V)
Engine Position	2 VR, 2 HALL
Outputs	
AUX High Side	2 (lim 3A)
AUX Low Side	2 (lim 0.5A)
LEDs	3 RGB
Communications	
CAN 2.0B/CAN FD	2
RS-232 Ports	1
LIN Bus Ports	1
Ethernet	1 (100Mbit/1Gbit)
Internal Sensors	
Accelerometer	3 axis (+- 16g) 100Hz
Gyroscope	3 axis 100Hz
IMU	calculated roll, pitch, yaw
GPS	25Hz Multi-GNSS
Real Time Clock	with battery backup
Device/Sensor V monitor	+12V supply/+5V sensor supply
Device Temperature monitor	Yes
Barometric Pressure Sensor	Yes

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Technical Specifications - Continued

Datalogging	
Memory	1GB (expandable)
Log Rate Max	200kHz for High Speed Channels
Engine Log	Yes
Max Data Channels	up to 512
Max Flag Channels	up to 512
Calculations	
Lap Times	Yes
Acceleration Performance	Yes
Engine Power & Torque	Yes
Math Channels	16
Trip Meters	2
Operating Conditions	
Supply Voltage Range	9-24V DC
Temperature Range	-10 to +50 degC
Physical	
Connectors	Souriau Motorsport
Dimensions	100mm x 100mm x 25/39mm
Weight	250g
Material	CNC machined aluminum
Sealing	IP67 water proof

Combustion Specific Calculations

<ul style="list-style-type: none"> ■ Pmax & Pmax CA ■ Start - End of Combustion ■ Combustion Duration ■ Torque, Power ■ Knock Intensity, Max Pressure, Energy ■ Heat Release graph % max value & max value CA 	<ul style="list-style-type: none"> ■ dPmax&dPmax CA ■ Iimp Net, Gross, Pumping ■ Burn Angles ■ Volumetric Efficiency ■ Pre-ignition and Mis-fire detection ■ MFB graph & CA50, CA90 values
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System Configuration & Options

The PCA-2000 system is available with 4, 8 or 16 high-speed data channels (for pressure sensors). The 4-CH & 8-CH versions are upgradable via a firmware purchase. An additional optional firmware & software module for Valve Motion Data Analysis suitable for Spintron machines is also available.

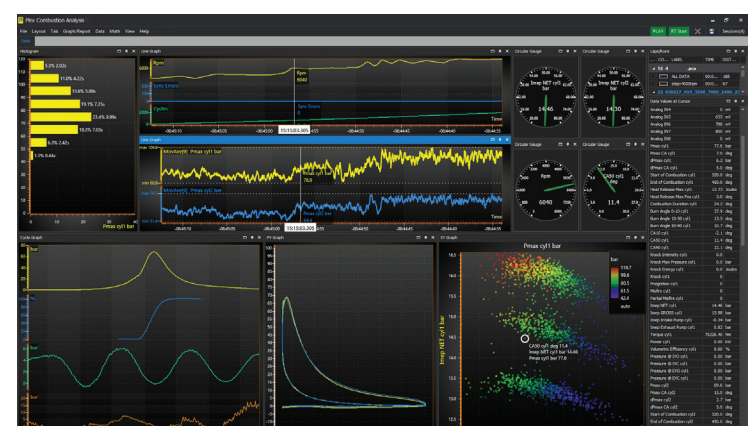
Compatible Sensors

PCA-2000+ logger is compatible with all types of piezoelectric & optical pressure sensors (in-cylinder & modified spark plug), intake & exhaust pressure sensors & any other engine or chassis sensor. AVL and Kistler sensors require external amplifiers. PLEX TUNING only resells the Optrand and Kulite sensors. AVL or Kistler have to be purchased directly by the customers from the corresponding vendors.



Accompanying Software

- **PLEX DEVICE MANAGER V2.0**
Free software for PCA-2000 logger configuration (I/Os, CAN BUS, etc)
- **PLEX PCA-WIN V2.0**
Bundled SW for high-level Combustion Data analysis
- **PLEX PCA-WIN-SPN V2.0**
Optional software module for high-level Valve Motion Data analysis



Key Analysis Software Features

- ▶ Customizable UI & fast keyboard shortcuts
- ▶ Easy file comparison with live file updating
- ▶ Live data updating
- ▶ Smart tuning maps
- ▶ Multiple data graphs & reports
- ▶ CSV data import & export
- ▶ Video file sync



PIN Functions - Connector A (RED) - SOURIAU 8STA6-14-35SN

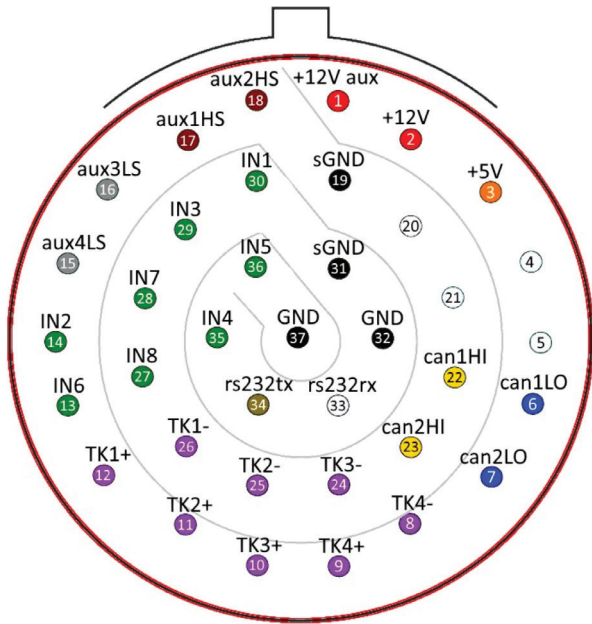
#	Label	Description	Notes
1	+12V AUX	Power supply for AUX1 and AUX2. 9-18V. Max 6A.	Connect to a switched +12V power source
2	+12V	Power supply for the device. 9-18V. Max 0.5A	Connect to a switched +12V power source
3	5V	Regulated 5V sensor supply output. Max 200mA	Current and thermal limit. Shared supply with pin B17
4	NOT USED		
5	NOT USED		
6	CAN BUS 1 LO	250kbit – 1.333Mbit CAN2.0, up to 5Mbit CAN FD	selectable 120R termination
7	CAN BUS 2 LO	250kbit – 1.333Mbit CAN2.0, up to 5Mbit CAN FD	selectable 120R termination
8	TK4-	Type-K thermocouple input 4, negative	
9	TK4+	Type-K thermocouple input 4, positive	
10	TK3+	Type-K thermocouple input 3, positive	
11	TK2+	Type-K thermocouple input 2, positive	
12	TK1+	Type-K thermocouple input 1, positive	
13	AN6 / DI6	Analog/Digital input 0-16V	
14	AN2 / DI2	Analog/Digital 0-5V,selectable pull up 3.3KOhm	
15	AUX4 LS	Auxiliary output – Low Side 0.5A max	ON/OFF or PWM.Sinks current to GND
16	AUX3 LS	Auxiliary output – Low Side 0.5A max	ON/OFF or PWM.Sinks current to GND
17	AUX1 HS	Auxiliary output – High Side 3A max	ON/OFF or PWM.Sources current from pin A1
18	AUX2 HS	Auxiliary output – High Side 3A max	ON/OFF or PWM.Sources current from pin A1
19	SGND	Ground supply output for sensors	
20	NOT USED		
21	NOT USED		
22	CAN BUS 1 HI	250kbit – 1.333Mbit CAN2.0, up to 5Mbit CAN FD	selectable 120R termination
23	CAN BUS 2 HI	250kbit – 1.333Mbit CAN2.0, up to 5Mbit CAN FD	selectable 120R termination
24	TK3-	Type-K thermocouple input 3, negative	
25	TK2-	Type-K thermocouple input 2, negative	
26	TK1-	Type-K thermocouple input 1, negative	
27	AN8 / DI8	Analog/Digital input 0-16V	
28	AN7 / DI7	Analog/Digital input 0-16V	
29	AN3 / DI3	Analog/Digital 0-5V,selectable pull up 3.3KOhm	
30	AN1 / DI1	Analog/Digital 0-5V,selectable pull up 3.3KOhm	
31	SGND	Ground supply output for sensors	
32	GND	Ground supply for the device	Connect both GND pins to the chassis ground
33	RS232-RX	RS232 data input	
34	RS232-TX	RS232 data output	
35	AN4 / DI4 / FR4	Analog/Digital 0-5V,selectable pull up 3.3KOhm	
36	AN5 / DI5 / FR5	Analog/Digital input 0-16V	
37	GND	Ground supply for the device	Connect both GND pins to the chassis ground

PIN Functions - Connector B (YELLOW) - SOURIAU 8STA6-14-35SA

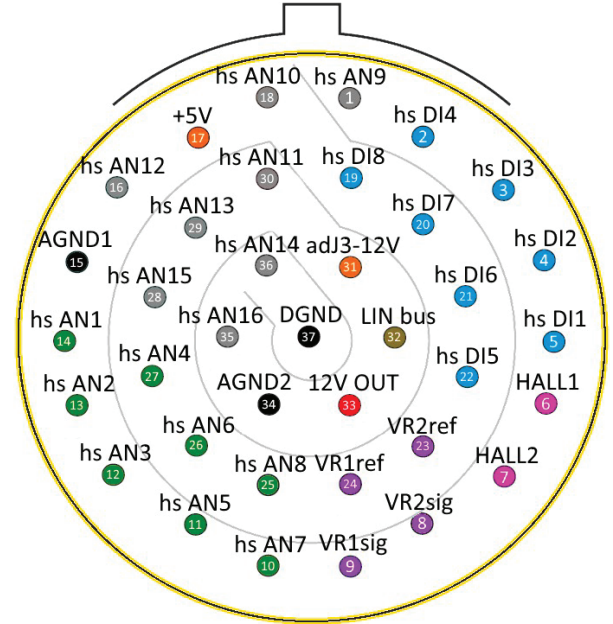
#	Label	Description	Notes
1	HS AN9/HSAN1-	High speed analog input, various ranges from 0-2.5V to dif +-20V	Alternate negative input for HSAN1 in differential mode
2	HS DI4	High Speed digital / frequency input	Configurable as a group fro 5V to 12V Signals
3	HS DI3	High Speed digital / frequency input	
4	HS DI2	High Speed digital / frequency input	
5	HS DI1	High Speed digital / frequency input	
6	HALL1	Engine position input from HALL / digital sensor	
7	HALL2	Engine position input from HALL / digital sensor	
8	VR2sig	Engine position input from VR / HALL	signal connection
9	VR1sig	Engine position input from VR / HALL	signal connection
10	HS AN7	High speed analog input, various ranges from 0-2.5V to dif +-20V	
11	HS AN5	High speed analog input, various ranges from 0-2.5V to dif +-20V	
12	HS AN3	High speed analog input, various ranges from 0-2.5V to dif +-20V	
13	HS AN2	High speed analog input, various ranges from 0-2.5V to dif +-20V	
14	HS AN1	High speed analog input, various ranges from 0-2.5V to dif +-20V	
15	AGND1	High Speed analog input ground supply 1	Use ONLY as ground for HS AN1-8 analog signals
16	HS AN12/ HSAN4-	High speed analog input, various ranges from 0-2.5V to dif +-20V	Alternate negative input for HSAN4 in differential mode
17	5V	Regulated 5V sensor supply. Max 200mA	Current and thermal limit. Shared supply with pin A3
18	HS AN10/ HSAN2-	High speed analog input, various ranges from 0-2.5V to dif +-20V	
19	HS DI8	High Speed digital / frequency input	Configurable as a group for 5 or 12V Signals
20	HS DI7	High Speed digital / frequency input	
21	HS DI6	High Speed digital / frequency input	
22	HS DI5	High Speed digital / frequency input	
23	VR2ref	Engine position reference input from VR sensor	reference connection, leave floating for HALL signals
24	VR1ref	Engine position reference input from VR sensor	reference connection, leave floating for HALL signals
25	HS AN8	High speed analog input, various ranges from 0-2.5V to dif +-20V	
26	HS AN6	High speed analog input, various ranges from 0-2.5V to dif +-20V	
27	HS AN4	High speed analog input, various ranges from 0-2.5V to dif +-20V	
28	HS AN15/ HSAN7-	High speed analog input, various ranges from 0-2.5V to dif +-20V	Alternate negative input for HSAN7 in differential mode
29	HS AN13/ HSAN5-	High speed analog input, various ranges from 0-2.5V to dif +-20V	Alternate negative input for HSAN5 in differential mode
30	HS AN11/HSAN3-	High speed analog input, various ranges from 0-2.5V to dif +-20V	Alternate negative input for HSAN3 in differential mode
31	ADJ 3-10V	Adjustable sensor power supply output for sensors	max 0.2A
32	LIN	LIN Bus	
33	12V OUT	Supply output for external devices. Voltage mirrors A2 supply input.	max 1A, fuse limit 3A
34	AGND2	High Speed analog input ground supply 2	Use ONLY as ground for HS AN9-16 analog signals
35	HS AN16/ HSAN8-	High speed analog input, various ranges from 0-2.5V to dif +-20V	Alternate negative input for HSAN8 in differential mode
36	HS AN14/ HSAN6-	High speed analog input, various ranges from 0-2.5V to dif +-20V	Alternate negative input for HSAN6 in differential mode
37	DGND	High Speed digital input ground.	Use ONLY as ground for HS Dix and HALLx

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Drawing Connector A (RED)

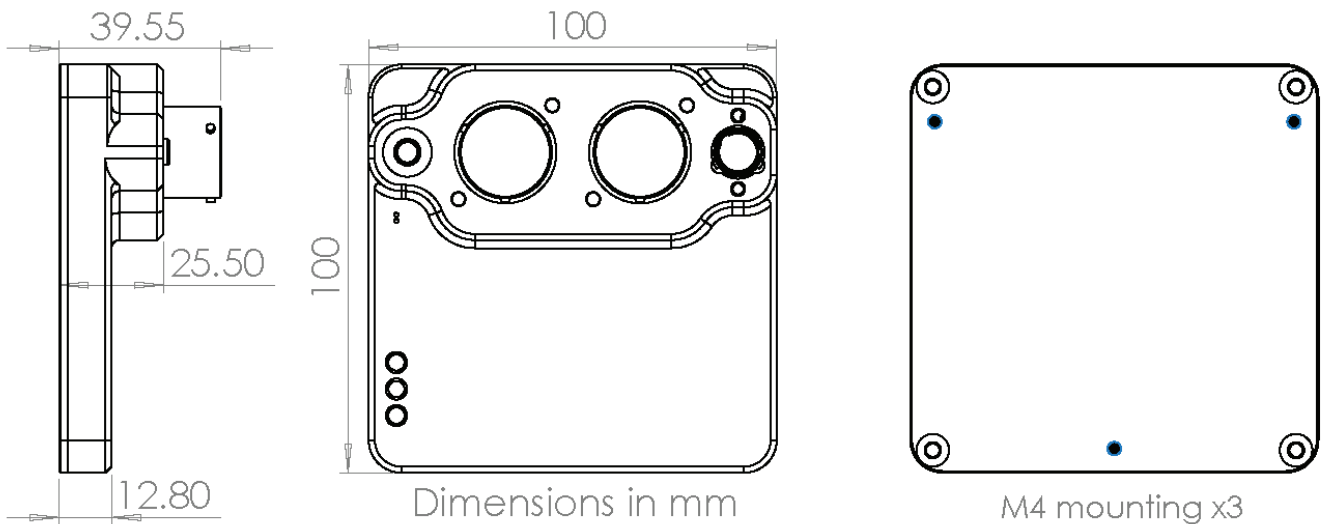


Drawing Connector B (YELLOW)



Views looking into the device connectors from the wire side

Dimensions & Mounting



ATTENTION

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