Compact. Configurable. Combustion.

Today more than ever, engines must be designed to deliver power and performance in a package with excellent fuel economy, while meeting stringent emissions standards worldwide. In addition, engineers must demonstrate that these engines are capable of achieving these goals beyond the lab, in the real world. To help with this, A&D applied their 25 years of combustion analysis expertise to the development of the Phoenix C3, a compact, configurable, combustion analysis system ideal for in-vehicle testing or any application with a low channel count. Available in 4-, 8-, and 12-channel configurations, the Phoenix C3 represents the next generation of in-cylinder combustion analysis,. The headless operation supports configuration through any device with a web browser, eliminating the need for an in-vehicle PC. The system supports infinite streaming, and the large data storage capacity provides the ability to perform extended test procedures, such at FTP75, without interruption.

The Phoenix C3 headless operation supports configuration through any device with a web browser.

Benefits:

- The internal web server eliminates the need for a PC by enabling test configuration through any device with a web browser; this ensures that the software is immune to changes in operating system or platform.

- Large data storage capacity supports extended test procedures, such as FTP 75, without interruption.

- Cycle-by-cycle combustion results, such as misfire and ignition delay, can be infinitely streamed to third-party systems using standardized protocols (CAN or XCP).

Features:

- Compact design for in-vehicle data acquisition

- Real-time cycle-by-cycle combustion analysis

- Support for user-defined cycle- by-cycle calculations

- Multiple cycle-by-cycle streaming output choices

- Operation without a PC

- Large data storage with SD card support

The Integrated System

The Phoenix C3 supports "headless" operation, meaning it can be configured and monitored from any device with a web browser. This eliminates the need for an additional PC.

- **Large data storage capacity**
- **Industry-standard streaming outputs for closed-loop control**
- **Support for user-defined cycle-by-cycle calculations**
- **Integrated web server for diagnostic purposes**

Stackable Design

The Phoenix C3 system consists of a main processor and up to three four-channel input modules. The screwless, stackable design requires no tools, making the system easily customizable, with 4, 8 or 12 channels.

Specifications

Category	Feature	Phoenix AM	Phoenix RT	Phoenix C3
High-Speed Analog Inputs	# Channels	12 per module up to 24	12 per module up to 48	2 on main processor 4 per input module Up to 12 channels
	Resolution	16-bit	16-bit	16-bit
	Acquisition Rate	20,000 RPM at 0.1° 2 MHz	20,000 RPM at 0.1° 2 MHz	8,000 RPM at 0.1° 2 MHz
	Low-pass filters	None, 12.5kHz, 25kHz, 50kHz	None, 12.5kHz, 25kHz, 50kHz	None, 12.5kHz, 25kHz, 50kHz
	Input Ranges	± 1 V, ± 2 V, ± 5 V, ± 10 V,	± 1 V, ± 2 V, ± 5 V, ± 10 V,	± 1 V, ± 5 V, ± 10 V
	Input Impedances	~25 kΩ (~100 kΩ on ± 50 V range)	~25 kΩ (~100 kΩ on ± 50 V range)	10 kΩ, 100 kΩ, 1 MΩ, 10 MΩ
Low-Speed Analog Inputs	# Channels	N/A	N/A	2
	Resolution			12-bit
	Acquisition Rate			8,000 RPM at 1.0° 500 KHz
	Input Ranges			± 10 V
Analog Outputs	# Channels	N/A	16	N/A
	Resolution		16-bit	
	Update Rate		100 Hz	
	Output Range		± 10 V	
Digital I/O	# Channels (Up to four used by an encoder)	8 inputs	16 outputs	4 inputs or 4 outputs 4 per module, up to 12
	Input Ranges	TTL	N/A	± 5 V
	Maximum Encoder Resolution	0.1°		0.1°
Data & Analysis	Analysis Method	Data is streamed to host PC for analysis	Real-time cycle-by-cycle data is streamed to the DSP core on-board Phoenix RT for analysis	Real-time cycle-by-cycle data is streamed to the DSP core on board Phoenix C3 for analysis
	Analysis rate without missing an engine cycle	Lossless real-time analysis not guaranteed over 1,200 RPM	12,000 RPM at 0.1°	8,000 RPM at 0.1°
	System Memory	256 MB	2 GB	1 GB (plus SD card for data storage)
	Non-volatile logging	N/A	SD	SD
	Test Bench Interfaces	Winsocket	Winsocket, UDP, XCP and CANbus	XCP & CANbus
	Host PC Connection	1 Gigabit Ethernet	1 Gigabit Ethernet	1 Gigabit Ethernet
	Headless Operation	No	No	Yes
Power & Mechanical	Input Power	10 - 16 volts DC (50 watts @ 12VDC) 120/240 V 50/60 HZ VAC external power supply	10 - 30 volts DC (50 watts @ 12VDC) 120/240 V 50/60 HZ VAC external power supply	9-30 volts DC (20 watts @ 12VDC) 120/240 V 50/60 HZ VAC external power supply
	Dimensions (Single Module)	343mm (W) x 194mm (D) x 44mm (H) 13.5" (W) x 7.6" (D) x 1.8" (H)	343mm (W) x 200mm (D) x 44mm (H) 13.5" (W) x 7.9" (D) x 1.8" (H)	165mm (W) x 197mm (D) x 45mm (H) 6.5" (W) x 7.75" (D) x 1.75" (H)
	Weight (Single Module)	2.2 kg (4.9 lb.)	2.2 kg (4.9 lb.)	CPU board 1.0 kg (2.2 lb.) Add-on board 0.6 kg (1.4 lb.)
Environmental	Operating temperature	0 °C to 50 °C (32 °F to 122 °F)	0 °C to 50 °C (32 °F to 122 °F)	-40 °C to 70 °C (-40 °F to 158 °F)
	Operating humidity	0% to 95% humidity non-condensing	0% to 95% humidity non-condensing	0% to 95% humidity non-condensing