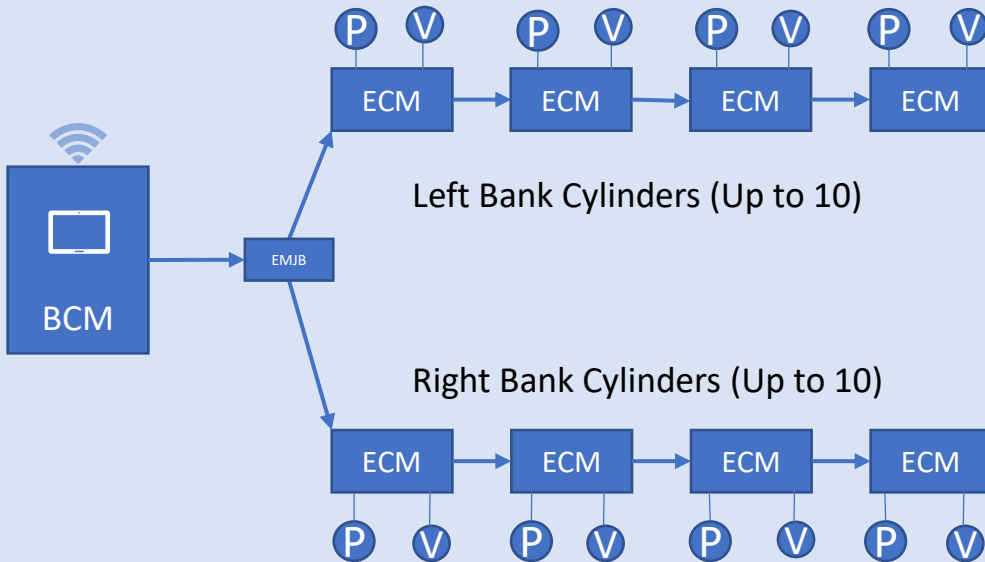


ProBalance® Plus Automatic Engine Balance



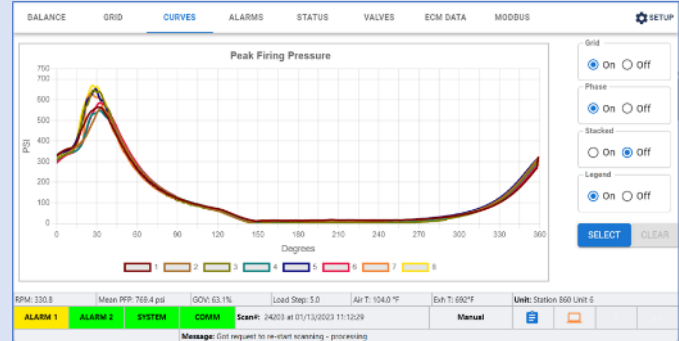
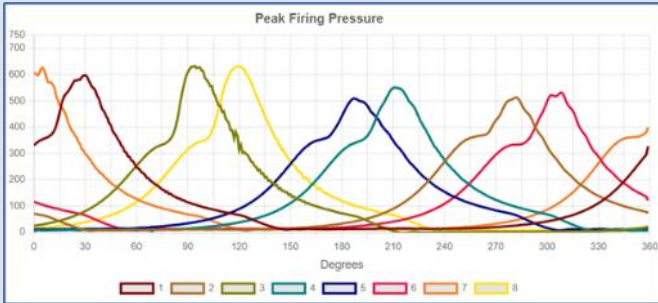
- Automatic engine balancing Valves (ABVs)
- MODBUS communication to Unit PLC
- Wireless to tablet
- Alarm on imbalance, Hi PFP, Hi standard deviation
- Magnetic mounting
- Armored interconnect cables
- 7" Local touchscreen display
- Optional TDC and degree mag pickups

Machinery Monitoring Systems' ProBalance Plus system is a low-cost, easy & quick to install continuous power cylinder pressure balancing system. The ProBalance Plus system is based on (and upgradable from) the MMS ProBalance engine balance monitor. The ProBalance Plus includes the Balance Control Module (BCM) which has a 7" touchscreen that displays live engine balance, combustion statistics and diagnostics.

The ProBalance Plus system utilizes MMS stepper-motor controlled fuel valve (ABV) that replaced the manual balance valve.

The Engine Cylinder Modules (ECMs) are magnetically mounted and connected with a single, armored cable (one for each engine side for "V" configurations). Once the Kiene valves, pressure sensors and ABVs are installed, installation and commissioning of the Machinery Monitoring System ProBalance Plus system takes less than a day!





The screens above shows the phased and un-phased cylinder pressure plots. Combustion statistics that are tracked (and can be alarmed on) include:

- High peak firing pressure
- Misfires
- Pre- or Late-combustion
- Peak firing angle

The BCM local display (shown below) shows the engine's balance plot indicating each cylinder's deviation from engine average. A full suite of displays are available on both the BCM and wirelessly on the tablet.

BALANCE														GRID														CURVES														ALARMS														STATUS														VALVES														ECM DATA														MODBUS													
Cyl	Mean	Dev%	S Dev	High	Low	Delta	Exh T	State	Hi	Mean ∠	S Dev ∠	High ∠	Low ∠	Delta ∠	State	Mis	Pre	Late																																																																																													
1	798.4	3.9	0.8	799.0	797.0	2.0	692.0	0	0	15	1.4	17	13	4	1	0	0	0																																																																																													
2	816.6	6.3	11.9	837.0	799.0	38.0	717.0	Hi	0	13	0.5	14	13	1	0	0	0	0																																																																																													
3	798.1	3.9	0.8	799.0	797.0	2.0	661.0	0	0	17	2.8	22	13	9	0	0	0	0																																																																																													
4	742.1	-3.4	23.4	796.0	703.0	93.0	701.0	0	0	16	2.5	20	13	7	2	0	0	0																																																																																													
5	797.9	3.8	17.6	824.0	768.0	56.0	612.0	0	0	13	0.0	13	13	0	0	0	0	0																																																																																													
6	598.2	-22.2	0.8	599.0	597.0	2.0	746.0	Lo-L6	0	13	0.0	13	13	0	10	0	0	0																																																																																													
7	797.9	3.8	0.8	799.0	797.0	2.0	690.0	0	0	13	0.5	14	13	1	0	0	0	0																																																																																													
8	798.0	3.9	0.8	799.0	797.0	2.0	629.0	0	0	13	0.0	13	13	0	0	0	0	0																																																																																													
Unit	768.4		7.1	837.0	597.0	240.0				14	2.8	22	13	9																																																																																																	

RPM: 330.8 Mean PFP: 768.4 psi GOV: 63.1% Load Step: 5.0 Air T: 104.0 °F Exh T: 681°F Unit: Station 860 Unit 6

ALARM 1 ALARM 2 SYSTEM COMM Scan#: 23521 at 01/13/2023 09:12:05 Automatic

Message: undefined



ProBalance Plus Specifications

Hardware

Power Input	96 W, 24 VDC (20-29 VDC) (Based on 20 cylinders)
Sensor Inputs	(Per ECM) 1 Input, selectable: Voltage (0-5 V) or Current (4-20 mA) Calibration Sensor (EMJB) 4-20 mA
Relay Outputs(2)	Dry contacts, Normally energized NO & NC contacts Resistive Load: 1 A, 28 VDC max

Physical & Environmental

Mounting	Magnetic
Size	
(BCM)	12.3" x 10.0" x 5.0"
(ECM)	4.9" x 3.15" x 2.2"
(EMJB)	5.5" x 5.5" x 3.6"
(ABV)	Avail. w/ 1, 1.25, 1.5, 2 & 2.5 NPT connections
Weight	
(BCM)	13 lbs.
(ECM)	1.2 lbs.
(EMJB)	3.5 LBS
Operating Temp	ECM & EMJB, 0 – 85 °C (32 – 185 °F) BCM, 0 – 60 °C (32 – 140 °F) ABV, - 29 - 120°C (-20 – 248 °F)
Ratings	
Enclosures	BCM: NEMA 4 (IP 66) ECM & EMJB: NEMA 4X (IP 66) ABV: IP 65
System	Class I, Division 2, Groups B, C & D