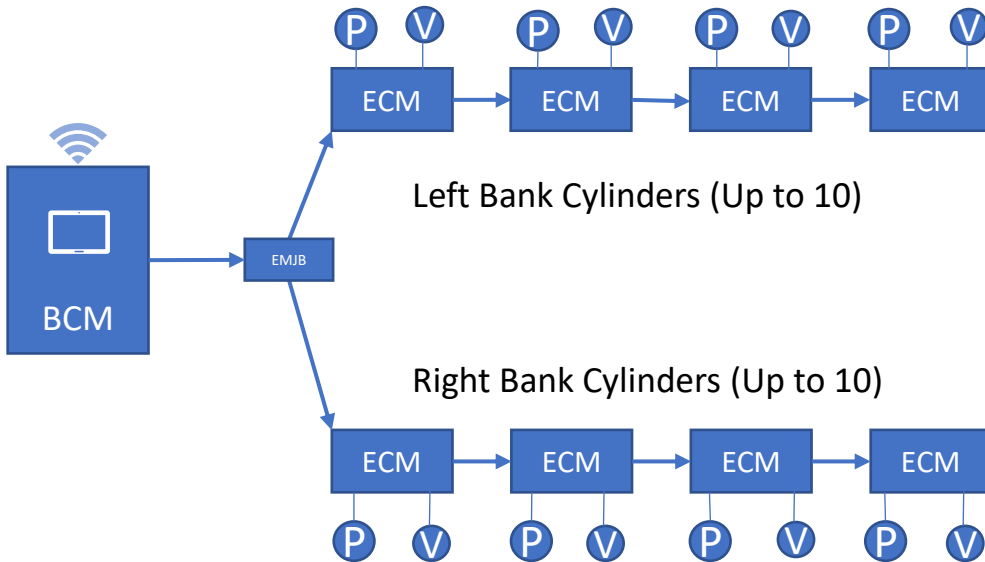


ProBalance® Plus Automatic Engine Balance

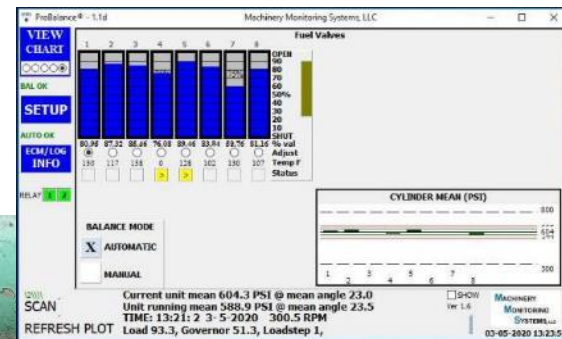


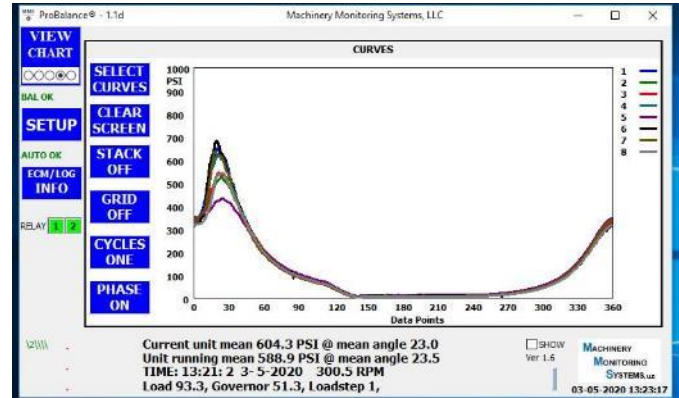
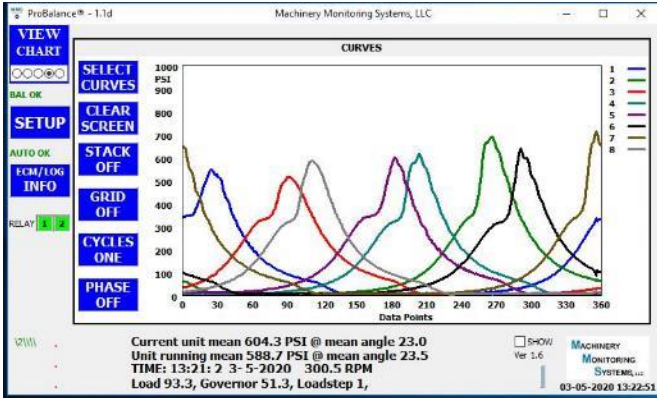
- Automatic engine balancing
- CECO electronic fuel gas modulators (eFGM)
- MODBUS communication to Unit PLC
- Wireless to tablet
- Alarm on imbalance, Hi PFP, Hi standard deviation
- Magnetic mounting
- Armored interconnect cables
- 7" Local touchscreen display
- Optional TDC and degree mag pickups

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 the CECO electronic fuel gas modulators (eFGMs). The stepper-motor controlled eFGMs are based on the standard CECO FGMs that have been in use for years.

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 eFGMs are installed, installation of the Machinery Monitoring System ProBalance Plus system takes less than an hour!

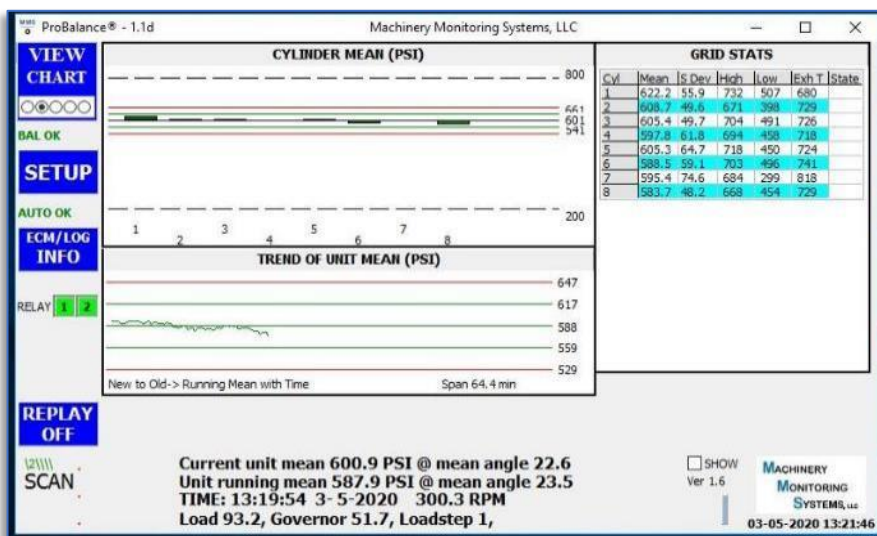




The screens above shows the phased and un-phased cylinder pressure plots. Combustion statistics that are tracked (and can be alarmed on) include:

- 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. The lower plot shows a two-hour trend of the unit's average peak firing pressure. Controls on the Local Touchscreen allow the user to view curves, statistics, play back historical data and more.



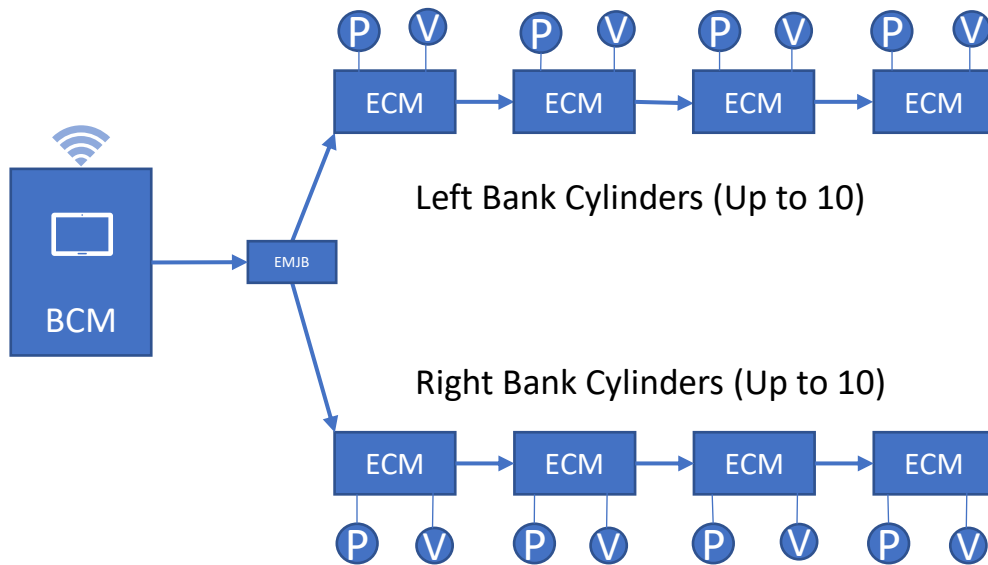
ProBalance Plus Specifications

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"
(eFGM)	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) eFGM, -10 – 71 °C (14 – 160 °F)
Ratings	
Enclosures	BCM: NEMA 4 (IP 66) ECM & EMJB: NEMA 4X (IP 66) eFGM: IP 65
System	Class I, Division 2, Groups B, C & D



Note: The individual elements on the drawing are “grouped” as a single item. To “un-group” them to be able to manipulate the individual elements, select the drawing and then click on “Arrange” and then “ungroup”