

TORNADO Blade Control Systems



Complete hydraulic and electric kits are available for installation on different types, brands, and sizes of machinery. Kits for popular models of machinery are readily available and more are continually being added. The installation kits typically contain all the hydraulic valves, valve brackets, hydraulic hoses, fittings, and electric cables necessary for automatic control of a specific machine.

Power cables, valve cables and straight receiver cables are stocked in 5 foot increments, while coiled receiver cables are a pre-cut length. Other lengths are available, but will require additional production time.

Additional cable configurations are available for special applications. Please consult the factory for special needs, pricing, or questions.



Your Apache representative can assist you with specific valve and electric kit recommendations as well as mounting requirements.

Control Box Specifications*

Accuracy Settings	CB52 0 - 50 mm
	CB26 0 - 38 mm
	with BE3+ 0 - 25 mm
On-Grade LED's	Green
High / Low LED's	Red
Operating Voltage	10 to 30 Volts DC, reverse polarity protected
Electrical Connection	Standard military type
Valve Compatibility	Proportional Time (On/Off), Proportional Current, Proportional Voltage
Maximum Current	5 Amps per driver
Weight	2.25 kg
Dimensions	178 x 134 x 120 mm

*Specifications subject to change without notice



A selection of remote switches are available to put an array of features at the operator's lever for quick access. Single and dual multi-switch configurations are available for the CB52. Simple Auto/Manual toggle controls are available for the CB24+ and CB26.



A telescoping mast can be used for mounting the receivers on bulldozers and other implements. The mast allows the receiver to be positioned above the machinery for unobstructed laser reception. The mast has a 4-foot (1.2 m) telescoping adjustment range with an English/Metric scale for positioning at known elevations. Built-in shock mounts on all four sides provide excellent damping of the laser receiver in rough operating conditions.

STM1 Mast Specifications*

Height Retracted	192 cm
Extension Length	122 cm
Tape Increments	1 mm
Weight	23.6 kg

*Specifications subject to change without notice



Made in USA

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Apache Technologies, Inc. is the world's largest manufacturer of laser detectors for construction and agriculture. This position of leadership was earned by developing leading edge, proprietary and patented laser detection technologies. These technologies are employed in all of Apache's handheld detectors and machine control receivers.



Apache also manufactures a complete line of handheld laser detectors.



Affordable Automatic Blade Control
Increase Productivity and Accuracy
Patented Proportional Technology



TORNADO Blade Control
Finish Grade Done Right



FINISH GRADE DONE RIGHT

With the TORNADO line of laser machine control products, the price of automatic blade control is now more affordable than ever.

Productivity

Automatic Blade Control keeps your machines moving and operating at maximum speed. Save time, save fuel, save material, save labor - on every grading job.

Accuracy

System accuracy, while maintaining high operating speeds, is crucial on your jobsite. Proportional receivers and proportional hydraulic valves assure maximum system accuracy and smooth, precise operation.

Control

Switch from automatic to manual control with the quick flick of one switch. Adjust system accuracy settings and hydraulic blade speed from the cab mounted control box. Dynamic blade balancing is set during installation for smooth raise and lower response.

Flexibility

A selection of BULLSEYE® receivers can be used for automatic machine control on grading equipment and easily moved to excavators or backhoes for digging depth indication for excavation.

Reliability

Proven Apache quality and durability are built in. Receivers are waterproof and designed to stand up to tough construction and outdoor environments. Durable polycarbonate and aluminum die cast housings provide a robust exterior and internal isolating shock mounts protect the electronics.

TORNADO Blade Control is used on construction grading machinery to automatically control the blade in earthmoving and grading applications. It is also used on agricultural land leveling and farm drainage machinery. A BULLSEYE laser receiver is mounted above the cutting edge of the blade. A control box and a hydraulic installation kit are tied into the machine's hydraulic system. Grade information from a rotating laser is processed and automatically directs the machine's hydraulics to maintain the elevation of the blade.

Tornado F1 Blade Control is a single control system that allows operators to automatically maintain the lift function of their machine's blade. It is an ideal solution for applications such as house pads or sports fields.



Tornado F2 Dual Blade Control is dual control system that allows the operator to complete a wide variety of tasks. The system can be used in Lift & Lift, Lift & Tilt, and Dual Independent applications. It can be used on multiple pieces of equipment for maximum versatility and return on investment.

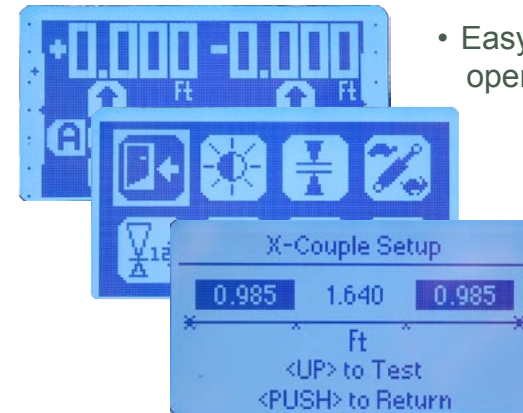


System Components

The **CB52 Dual Control Box** is the newest in Apache's offering of automatic machine control products. As part of the Tornado F2 Blade Control System, the box is compatible with Proportional Time (PT), Proportional Current (PC), and Proportional Voltage (PV) valves. The unit also features advanced Cross Coupling Compensation. Elevation control can be used in conjunction with with slope control when used with BULLSEYE 5+ and 6.



CB52 Dual Control Box



- Easy to read LCD user interface and intuitive switches gives the operator easy access to commonly used functions such as blade offset, manual raise/lower, and slope control.
- Control your accuracy, speed, units of measure, as well as recall stored set-ups from the icon-based user menu.
- Cross-coupling compensation actively stabilizes the blade and eliminates "duckwalking" errors.

The **CB26 Control Box** has 16 on-grade accuracy settings from 0 to 38 mm. It features simple controls for quick set-ups and operation. The F1 cab mounted control box works with Proportional Time (PT), Proportional Current (PC), and Proportional Voltage (PV) valves.

The **CB24+ Control Box** coupled with a BULLSEYE 3+ is a cost effective means of automating equipment such as trenchers, tile plows, drag boxes and other slow moving applications.



CB24+ and CB26 Control Box



BULLSEYE receivers work with all rotating lasers and feature:

- 360° of proportional reception for quick set-up and continuous reception.
- Tough waterproof construction withstands harsh conditions.
- Super bright LED's for high visibility in bright light.
- Quick, secure mounting, easy to move to different machinery.

BULLSEYE Models 5+ and 6 have additional features when used as indicate systems, specifically for use in excavating systems.

The Proportional Control Advantage

Proportional receivers direct the machine's hydraulics to correct the blade "in proportion to" the distance the blade is from on-grade.

Apache's patented proportional photocells provide precise beam positioning data. Coupled with the ultra fast signal processing found in both our single and dual systems, the Tornado F1 or F2 give you the smoothest blade response and highest accuracy available.