

The TENSA **ROBORIGGER** products (patent pending) use gyroscopic and inertial forces to allow loads to be controlled and orientated remotely. Release operations can also be performed using wireless control. No people need to be in the vicinity of the load during the dangerous lifting and lowering phases.

**ROBORIGGER** increases safety dramatically and makes some challenging tasks so easy.



## WHY YOU NEED **ROBORIGGER**

**ROBORIGGER** reduces manning needed for lifting operations by at least 1



### Without **ROBORIGGER**

- men connecting rigging at the truck at ground level
- Men beneath load use tag ropes to orient load on lift off then let go of tag lines
- Load is lifted and may rotate in the wind. Crane driver must keep load clear of structure.
- men at top beneath and alongside load - grab tag lines, stop load swinging, orient load and disconnect rigging.

### With **ROBORIGGER**

- 1 man connects rigging at the truck at ground level.
- Crane driver engages **ROBORIGGER** to orient load and lifts load. Load does not rotate - it holds the orientation.
- Crane driver or dogman requests **ROBORIGGER** to reorientate load to new orientation for placement. Crane driver lowers load.
- Crane driver or dogman disconnects rigging remotely using double button press system.
- Hook is lowered to ground and cycle repeats.

**NO PEOPLE UNDER OR NEAR LIFTED LOAD.**

**ROBORIGGER** allows operations that were previously very challenging to be undertaken simply and safely.

Without **ROBORIGGER**



Personnel needed to guide load into place and verify correct positioning. Once in place, personnel need to reposition in order to access and release rigging



Load needs to be captured and then guided into place by personnel with harnesses. Once secure personnel climb onto component and release the rigging



Load is free to rotate and can hit building until captured. Load has tag lines that are hooked by reaching out with sticks. Personnel then rotate load and it is brought into place. Personnel then go to top of load to disconnect rigging

With **ROBORIGGER**



Load is oriented and landed using crane driver or 1 observer



Load is oriented and lowered into position with rotation controlled by rigger in a safe location. When load is positioned, rigger secures load then releases load remotely from a safe location.



Panel is lifted and maintains perfect orientation using **ROBORIGGER**. Load is swung into position and then secured by personnel. Load can be released remotely once it is secured.

**ROBORIGGER** keeps personnel away from the load when undertaking lifting and lowering operations



**X** These people do not need to be near the load!



**✘** These people do not need to be near the load!



## HOW CAN I USE **ROBORIGGER?**



Tower Cranes



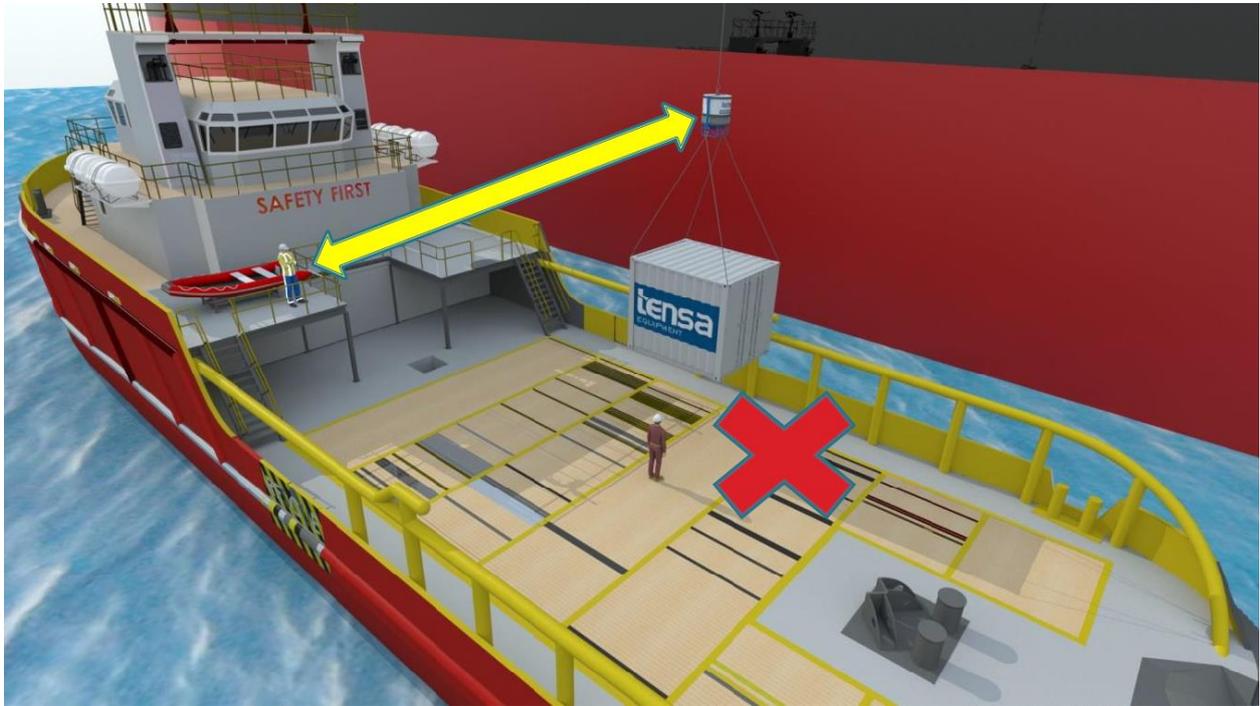
Mobile Cranes



Installing wind turbine blades



Spreader beams - in air and subsea



Offshore

## FREQUENTLY ASKED QUESTIONS

### HOW DOES **ROBORIGGER** WORK?

**ROBORIGGER** uses gyroscopic and inertial forces from rotating flywheels to orient the load. This is similar technology to that used to orient spacecraft. **ROBORIGGER** can orient the loads when hanging on a single wire with a swivel. It does not need anything attached to it. The unit has sensors which detect the rotation rate and the heading. The sophisticated control system ensures that the load rotation is controlled within strict parameters and that the unit is able to hold the load at a constant heading when required even if there is gusting wind.

### WHAT ARE THE FEATURES OF **ROBORIGGER**?

- Ability to rotate and orient load using a wireless remote control
- Remote hook release that requires 2 button press and will not release under load
- Can store 2 desired headings to allow ease of operation when moving many loads
- 12 hour battery life
- Batteries rechargeable overnight.
- Optional exchangeable battery module allowing 24x7 operation
- Integrated load cell with load readout on remote handset
- Inbuilt condition monitoring, lift logging and diagnostics
- Optional downward looking video camera

## IS **ROBORIGGER** SAFE?

- **ROBORIGGER** is designed as a lifting appliance in accordance with AS4991.
- Every unit is load tested and comes with a test certificate verifying the load test and performance test
- The remote control complies with the Australian Crane Code AS1418 and includes all of the safety features required for crane operation. If control is lost the unit will hold the load heading
- The unit has flashing red, orange and green warning lights. Orange indicates it is in rotate mode under control of its control system. Red lights indicate a fault. Green lights indicate a healthy system. A buzzer sounds when the load is being released.
- The electrical system uses low voltage and does not require licensed electricians. The external battery charger runs on 240V single phase.

## WHAT IS THE CAPACITY OF **ROBORIGGER**?

The capacity of **ROBORIGGER** is governed by both the lifting capacity and the amount of rotating torque that the unit can apply. Initially the focus will be on the AR5 and AR10 models which are rated for 5 and 10 tonne loads. We have a design for a 15t model which is quite different and can be scaled up to 50t if required. Two or 3 **ROBORIGGER** units can be attached to a spreader system to double or triple the rotating capacity.

**ROBORIGGER** subsea uses the same control system and battery pack from the surface system but achieves the rotational capacity by using thrusters. The capacity of this system is virtually unlimited.

## CAN **ROBORIGGER** CONTROL A LOAD IN A WIND?

Absolutely. A large focus of the research effort has gone into developing a system that can handle a longer term force on the load such as caused by wind. **ROBORIGGER** can generate a serious amount of rotational force continuously when required!

## IS **ROBORIGGER** RELIABLE AND DOES IT REQUIRE MUCH MAINTENANCE?

The core components of **ROBORIGGER** such as the motor, motor controller and battery system have been adapted from electric vehicle technology and they are proven components that will give a long life. The control system and sensors use a number of modular boards which can be easily swapped out if they need replacement. **ROBORIGGER** is built tough and we don't expect any failures. Routine servicing includes checking the motor coolant and a visual inspection for any loose or damaged components. The unit has inbuilt fault monitoring and logs any performance anomalies. The unit diagnostics can be accessed over the internet via wifi or 3g network.

## CAN YOU SUPPLY A CUSTOM **ROBORIGGER**?

Yes. The rotational principles, control system and remote controlled hook system can be adapted to work with specialized lifting equipment to lift loads such as pipe bundles or to include special gripping tools. The subsea **ROBORIGGER** is an adaption that uses the same control system and battery pack as the surface system. Talk to us about a special requirement.

## HOW MUCH DOES **ROBORIGGER** COST?

How much is a life worth? You will have greatly improved workplace safety and will now be able to undertake with ease some operations that were previously challenging and expensive. It is intended to price **ROBORIGGER** such that it pays back within 12 months based on improved efficiency of the lifting operations, being able to extend operational windows and the value of the logistical tracking data.

Roborigger v5a