

## An Upgrade Kit for Selected TITAN 3 Models

***With slave electronics located inside the slave arm, your upgraded TITAN 3 manipulator system will set new standards for reliability and performance.***

- Entirely Enclosed in the Slave Arm
- Reduced Number of Electrical Connections Enhances Reliability
- Visual Diagnostic Indicators on AC Board Facilitate Troubleshooting
- Easy Installation Takes Less than 4 Hours
- Decreased System Weight
- Water Detection Circuit
- Multiple Configurations for Mating Connectors
- Camera-Ready Wiring for Installation of an Integrated Wrist Camera

### UPGRADE ELIGIBILITY

To be eligible for upgrade, your TITAN 3 must:

- Have an upper arm in which the cover closest to the azimuth is secured with 16 hex head cap screws.
- Have a compensation volume relief valve mounted on one of the upper arm cover plates. (If not, you can install relief valve kit 008-0166.)
- Have Moog 30 servo valves installed for wrist and jaw functions. (Moog 31 servo valves can be used for all other arm functions.)





Diagnostic lights in the connector head indicate the status of electrical power delivery to the slave arm, master controller transmission to the slave arm, and slave arm responsiveness.

### REDUCED HARDWARE REQUIREMENTS

With the upgrade to in-arm electronics, the slave controller, slave cable, and 79-pin wiring harness are replaced by the in-arm electronics and a small-diameter SeaNet cable, reducing system weight, installation space, and spares requirements.

### RELIABLE IN-ARM SLAVE ELECTRONICS

Locating all downside slave arm electronics inside the manipulator forearm greatly reduces the number of electrical connections, increasing the system's ability to withstand shock, and simplifying service operations.



The in-arm slave electronics module features diagnostic lights that indicate processor health.

## ELECTRONICS SPECIFICATIONS

### Electrical and Telemetry Requirements

Input power:

Master controller..... 90-260 VAC, 50-60 Hz, single phase  
 Slave arm..... 24VDC

Power consumption:

Master controller..... 6 W start, 3 W run  
 Slave in-arm controller plus solenoid..... 16 W

Telemetry..... User selectable, RS-232 or RS-422/485 half-duplex 2-wire

### Environmental Specifications

Depth rating:

Standard..... 4,000 msw (13,124 fsw)  
 Extended..... 7,000 msw (22,967 fsw)

Operating temperature ..... -2 to +54 degrees C (+28 to +130 degrees F)

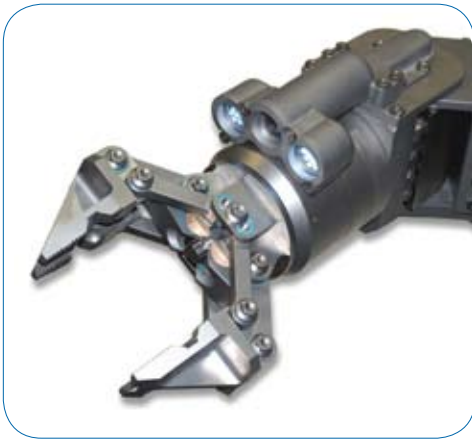
Storage temperature ..... -15 to +71 degrees C (+5 to +160 degrees F)

Humidity..... 0% to 100% condensing

## UPGRADE FEATURES

- Slave controller, slave cable, and 79-pin wiring harness are replaced by in-arm slave electronics and a small-diameter SeaNet cable.
- Diagnostic LEDs in the slave SeaNet cable allow first-level diagnostics to be performed solely by visual inspection.
- Standard depth rating of 4,000 msw (13,124 fsw), with optional extended depth rating to 7,000 msw (22,967 fsw).
- Faster control loop execution reduces slave arm response time and increases accuracy.
- Total system weight is reduced by 18 kg (40 lb) in air and 9 kg (20 lb) in water.
- The slave arm electronics board detects water intrusion.
- Slave arm electronics operate on 24VDC power.
- Includes wiring for the TITAN integrated wrist camera.

Contact [Sales@Schilling.com](mailto:Sales@Schilling.com) for information on specific retrofit kits for your systems.



Wiring for the in-arm slave electronics contains coaxial cable, allowing easy installation of the TITAN integrated wrist camera.

### ROBUST POWER/SIGNAL CONNECTION

A SeaNet cable connects the slave arm to electrical power and telemetry, providing a robust, reliable attachment. The cable, which is only 8.9 mm (3/8 inch) in diameter, is actively pressure balanced and oil filled. The connector head has spring-loaded contacts, and a positive locking feature eliminating accidental cable disconnection.

### QUICK, EASY DIAGNOSTICS

The SeaNet cable connector head contains bright LED status indicator lights that allow first-level diagnostics to be performed solely by visual inspection. The lights show that electrical power is being delivered to the arm, that the controller is transmitting to the arm, and that the arm is responding. This information lets the operator quickly determine where to begin troubleshooting, without removing connectors, applying a voltmeter, or opening sealed enclosures. The system also detects missing or reduced arm position sensor signals, and diagnostic lights on the in-arm electronics module indicate processor health.

The system also detects missing or reduced slave arm position sensor signals. Diagnostic lights on the in-arm slave electronics module indicate processor health.

### WATER DETECTION CIRCUITS

The slave electronics board can detect the presence of water in the low point of the forearm manifold (where water is most likely to accumulate). A warning on the master controller screen alerts the operator when water is detected.

### CAMERA-READY WIRING

Wiring for the in-arm slave electronics contains coaxial cable, allowing easy installation of the TITAN integrated wrist camera.

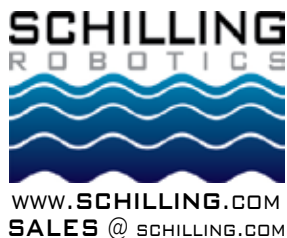
The high-resolution camera and two bright LED lights are contained in an integrated titanium housing for maximum protection. Since signals and power are routed through the manipulator arm, there is no external cabling that can be snagged or abraded. Both NTSC and PAL formats are supported.

Lights and the camera are controlled from any TITAN master controller, with no software upgrade required.

### CUSTOMER SUPPORT, TECHNICAL SUPPORT, AND TRAINING

- Worldwide Customer Support Network with Factory-Trained Technicians
- 24-Hour Telephone Access to Qualified Technical Staff
- On-Site and Offshore Installation/Mobilization Support
- Strategically Located Spares and Factory Service Facilities Worldwide
- Operation and Maintenance Training Courses Available at Our Factory, at Customer Facilities, or at Our Service Centers Worldwide

SO DEEP, NO ONE COMES REMOTELY CLOSE



**SCHILLING ROBOTICS, LLC**  
 Headquarters  
 260 Cousteau Place, Suite 200  
 Davis, California  
 95618-5412 U.S.A.  
 Tel.: +1 530 753 6718  
 Fax: +1 530 753 8092

**SCHILLING ROBOTICS, LLC**  
 Gulf of Mexico Regional Office  
 7102 W. Sam Houston Parkway N.  
 Suite 100  
 Houston, Texas  
 77040-3164 U.S.A.  
 Tel.: +1 281 598 4100  
 Fax: +1 281 598 4130

**SCHILLING ROBOTICS LTD**  
 North Sea Regional Office  
 Unit N, Nord Centre  
 Aberdeen  
 AB11 5DN U.K.  
 Tel.: +44 (0) 1224 560 900  
 Fax: +44 (0) 1224 560 901