



MULTIRACKTM

Optic / Thermistor Rack Control For Trucks

MODEL 688 OWNERS MANUAL

IMPORTANT OPERATOR INFORMATION

DATE INSTALLED: _____

UNIT NUMBER: _____

COMPARTMENT No.: _____ OVERFILL SHUTDOWN POINT: _____

COMPARTMENT No.: _____ OVERFILL SHUTDOWN POINT: _____

COMPARTMENT No.: _____ OVERFILL SHUTDOWN POINT: _____

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❖ **GARNET INSTRUMENTS LTD.**

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TABLE OF CONTENTS

- 1.0) INTRODUCTION**
- 2.0) 688 *MULTIRACK™* OPERATION AND FEATURES**
 - 2.1) Overview**
 - 2.2) MultiRack Gauge Module Operation**
 - 2.3) MultiRack Controller Operation**
 - 2.4) Installation**
- 3.0) TROUBLESHOOTING GUIDE**
 - 3.1) Overview**
 - 3.2) Gauge Module**
 - 3.3) Fibre Cable**
 - 3.4) Controller**
 - 3.5) Rack Socket**
- 4.0) SERVICE AND WARRANTY INFORMATION**
- 5.0) DEALER LIST**

1.0) INTRODUCTION

Congratulations on purchasing the Garnet Instruments Model 688 MultiRack Optic / Thermistor Rack Control for Trucks. The 688 represents the state of the art in multi-function overfill control for transport applications. The MultiRack is used in conjunction with either a SeeLevel or SeeLevel Special truck gauge to allow trucks to load at facilities controlled by either optic style (five wire) and thermistor style (two wire) loading racks. The MultiRack will shut down the loading rack when the product level reaches the programmed shutdown point in the SeeLevel gauge.

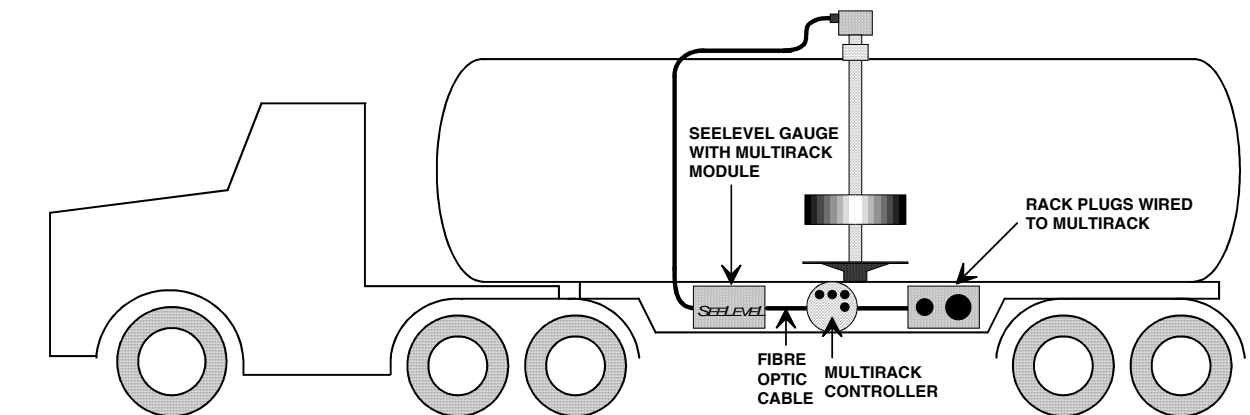
The MultiRack will withstand the vibration, shock, moisture, and temperature extremes encountered in transport applications. It is housed in a durable, weatherproof housing and will operate over an ambient temperature range of -40 C to +60 C (-40 F to +140 F).

The MultiRack does not require any 12V truck power to operate, it functions entirely on battery and rack power. Built in diagnostic lights simplify troubleshooting and monitor the connection to the loading rack.

2.0) 688 **MULTIRACK™** OPERATION AND FEATURES

2.1) Overview

For the 810PS SeeLevel gauge, the MultiRack system consists of a 688M MultiRack Driver Module (or 888 Universal Driver Module if the Model 815 SpillStop Overfill Prevention System is also installed), a fibre optic interconnect cable, and a 688S (single compartment) or 688D (dual compartment) rack controller. The gauge module is installed inside the SeeLevel and connected to alarm 4. For the 808PA SeeLevel Special gauge, only a 688M MultiRack Driver Module is needed. In both cases, the fibre optic cable carries a pulsed light signal from the module to the rack controller to tell it to permit loading. The rack controller is wired to the appropriate sockets for connection to the loading rack. When the gauge detects an overfill situation, the pulse light signal is turned off by the module and the rack controller goes to non-permit, which shuts down the loading rack.



2.2) Driver Module Operation

The 888 Universal Driver Module contains both a standard SpillStop gauge module as well as the optical transmitter for the MultiRack. The module, installed into a small plastic box, is attached into the SeeLevel gauge enclosure, and the SpillStop portion of the module functions exactly the same as the standard SpillStop module. The MultiRack portion of the module uses alarm point 4 to operate, which is programmed to shut down at the overfill point. When the SeeLevel float rises above the overfill point, alarm 4 shuts down and the optical output from the module stops, which makes the controller go to non-permit. Older models of the 810 have a terminal block on a circuit board mounted in the base of the enclosure and the 888 will have pins that are installed into the terminal block.

The MultiRack portion of the module operates from a lithium battery with a 10 year lifetime. If the battery goes dead, the module defaults to non-permit. The SpillStop portion is unaffected by the battery.

The 688M MultiRack Driver Module contains only the optical transmitter for the MultiRack, since the SpillStop module is built into the 808PA. The module mounts inside the 808PA display

enclosure and connects to the black ground wire and yellow alarm wire from the 808PA. Alarm 4 is programmed to operate the MultiRack, the same as for the 810 model.

2.3) Rack Controller Operation

The rack controller connects to the module via fibre optic cable and goes to permit only if the light pulse is present. The fibre cable is used to provide electrical isolation between the SeeLevel and the intrinsically safe wiring of the loading rack. The controller will only accept light pulses from a 888 or 688M module, it cannot be fooled by ambient light or the output from a sender bar. The controller operates entirely from rack power, it contains no batteries, and will function only when connected to an optic or thermistor rack.

If the truck has two trailers, then one controller is required per trailer, since the fibre optic cable cannot be connected between trailers. The single controller has one fibre input, and it is used for single compartment applications. The dual controller has two fibre inputs, and it is used for two compartment applications, and both fibre inputs must receive light pulses for the controller to permit.

The controller can operate either an optic (five wire) or a thermistor (two wire) loading rack. If the application has two trailers, then the optic portions of the two controllers are series wired just like optic probes. The controller has two thermistor leads to simulate two thermistor probes, and will operate with either one or both of the thermistor leads connected. For two trailer applications, each of the thermistor leads from the rack socket is connected to its own controller. The controller simulates a two wire thermistor regardless of product temperature, the third temperature compensation (rack green) lead is not used.

The controller is mounted in a round Betts junction box with a snap lid, providing excellent sealing against weather conditions, as well as visibility of the diagnostic LEDs. The cover of the controller is illustrated on the next page.

The OPTIC diagnostic LED indicates proper connection to the optic rack, it will illuminate whenever the ground and red power wires are connected, regardless of whether the controller is in permit or not. The OPTIC LED does not indicate whether the yellow or orange pulse leads are connected.

The THERM A and THERM B diagnostic LEDs indicate proper connection to the thermistor rack, regardless of whether the controller is in permit or not. If only one of the thermistor leads is used, then only its corresponding LED will illuminate.

The PERMIT diagnostic LED will light when the controller is in permit and is connected to either an optic or thermistor rack. It will not illuminate if the controller is not connected, since the rack is the controller power source.

WARNING: To maintain overflow protection, the operator MUST verify float movement of the SeeLevel (or SeeLevel Special) at the start of loading each compartment. If any skipping of calibration points is observed, discontinue loading until the problem is corrected. Please refer to the manuals for these instruments for further details.

2.4) Installation

Installation of the system consists of connecting the appropriate module into the gauge and programming alarm point 4. The controller enclosure is mounted, connected via fibre optic cable to the module, and wired to the rack sockets(s). Verification of system operation completes the installation.

3.0) TROUBLESHOOTING GUIDE

3.1) Overview

There are only 4 serviceable components to the system: the 888/688M module, the interconnecting fibre optic cable, the controller, and the third party rack sockets and wiring. Make sure that the compartment is in fact empty and that the SeeLevel or SeeLevel Special gauges are working correctly. To test the various components, substitute a known good component to see if the rest of the system is working.

3.2) Driver Module

The battery in the 888/688M module should last for 10 years, and is not user serviceable. If the controller is non-permissive, check the light output from the module, it should flash about 4 times per second if the gauge is telling it to. If it is not flashing, jumper alarm point 4 to ground (888), or connect the two wires from the module together (688M), this should make it flash. If not, the module is defective. If it does flash, the gauge alarm point 4 is not working, it may need to be programmed or serviced.

3.3) Fibre Cable

If the module produces a light pulse but it does not reach the controller, replace the fibre cable.

3.4) Controller

If the controller is non-permissive, check to make sure it is receiving light pulses from the fibre(s). Dual controllers need pulses from both fibres to permit. If the optic or thermistor diagnostic LEDs are on, but the permit light is off when the controller is receiving light pulses, replace the controller.

If the controller diagnostic LEDs are not on, check for voltage (using a voltmeter or Garnet TrackDown Tester) at the optic red wire or green thermistor wire. If the controller is getting power and ground, but does not light, replace it.

If the controller shows permit but does not allow loading, check the signals around the controller with a Garnet TrackDown Tester. If the controller does not pass the optic pulse, or if it is getting thermistor power but does not produce a pulse, replace the controller.

3.5) Rack Socket

The most likely cause of a non-permit situation is a bad rack socket connection. For a thermistor rack, if the diagnostic LED is on in the controller, then the socket connection is good. For an optic rack, the pulse input and output are not monitored (since the pulse width is so small, the LEDs would not be visible), so even though the LED is on there may still be a

connection problem. The Garnet TrackDown tester is the best equipment to use to trace the pulse through the system.

4.0) SERVICE AND WARRANTY INFORMATION

The warranty will apply only if the warranty card shipped with the equipment has been returned to Garnet Instruments Ltd.

Garnet Instruments Ltd. warrants equipment manufactured by Garnet to be free from defects in material and workmanship under normal use and service for a period of one year from the date of sale from Garnet or an Authorized Dealer. The warranty period will start from the date of purchase or installation as indicated on the warranty card. Under these warranties, Garnet shall be responsible only for actual loss or damage suffered and then only to the extent of Garnet's invoiced price of the product. Garnet shall not be liable in any case for labor charges for indirect, special, or consequential damages. Garnet shall not be liable in any case for the removal and/or reinstallation of defective Garnet equipment. These warranties shall not apply to any defects or other damages to any Garnet equipment that has been altered or tampered with by anyone other than Garnet factory representatives. In all cases, Garnet will warrant only Garnet products which are being used for applications acceptable to Garnet and within the technical specifications of the particular product. In addition, Garnet will warrant only those products which have been installed and maintained according to Garnet factory specifications.

LIMITATION ON WARRANTIES

These warranties are the only warranties, expressed or implied, upon which products are sold by Garnet and Garnet makes no warranty of merchantability or fitness for any particular purpose in respect to the products sold. Garnet products or parts thereof assumed to be defective by the purchaser within the stipulated warranty period should be returned to the seller, local distributor, or directly to Garnet for evaluation and service. Whenever direct factory evaluation, service or replacement is necessary, the customer must first, by either letter or phone, obtain a Returned Material Authorization (RMA) from Garnet Instruments directly. No material may be returned to Garnet without an RMA number assigned to it or without proper factory authorization. Any returns must be returned freight prepaid to: Garnet Instruments Ltd., 284 Kaska Road, Sherwood Park, Alberta, T8A 4G7. Returned warranted items will be repaired or replaced at the discretion of Garnet Instruments. Any Garnet items under the Garnet Warranty Policy that are deemed irreparable by Garnet Instruments will be replaced at no charge or a credit will be issued for that item subject to the customer's request.

If you do have a warranty claim or if the equipment needs to be serviced, contact the installation dealer. If you do need to contact Garnet, we can be reached as follows:

Garnet Instruments Ltd.
288 Kaska Road
Sherwood Park, Alberta
Canada T8A 4G7
E-mail: tstalker@garnetinstruments.com

5.0) DEALER LISTS

Canadian Dealer/Distributor List

Dealers

ADVANCE ENGINEERED PRODUCTS LTD. 10498-17 Street Edmonton AB T6P 1V8	Ph (780) 467-8891	H & S MECHANICAL Box 156 Carlyle SK S0C 0R0	Ph (306) 453-2213
ADVANCE ENGINEERED PRODUCTS LTD. 5502-56 Avenue S.E. Calgary AB T2C 4M6	1-800-332-8385 Ph (403) 720-4888	INNOVATIVE HYDRAULICS 5202-62 Street Lloydminster AB T9V 2E4	Ph (780) 875-4385
ADVANCE ENGINEERED PRODUCTS LTD. 5218-62 Street Lloydminster AB T9V 2E4	Ph (780) 875-4952	JASPER TANK #200, 53016 Hwy 60 Spruce Grove AB T7X 3G7	Ph (780) 962-1333
ADVANCE ENGINEERED PRODUCTS LTD. 144 Henderson Dr. Regina SK S4N 5P7	Ph (306) 721-5678	PARTCO West Road Industrial Park SUNDRE AB T0M 1X0	Ph (403) 638-3414
ADVANCE ENGINEERED PRODUCTS LTD. 2335 Schuyler Street Saskatoon SK S7M 5V1	Ph (306) 933-2445	PROTANK LTD. 400-410 Pinebush Road Cambridge ON N1R 8E6	1-800-205-6871 Ph (519) 624-5150
AV BRAKE (formerly McCOY BRO'S SOUTH) 4005-9 TH Ave North Lethbridge AB T1H 6H6	1-800-265-4387 Ph (403) 327-2299	QUICKSILVER MANUFACTURING LTD. (Nocorode Tanks) 1 Main Street Strome AB T0B 2H0	Ph (780) 672-8180
BRADVIN TRAILER SALES LTD. 10939-96 Ave. Grande Prairie AB T8V 3J4	Ph (780) 539-6260	REMTEC 933 Boul Simard Chambly QC J3L 4B7	Ph (450) 658-6671
COLUMBIA REMTEC 12343A-104 Avenue Surrey BC V3V 3H2	Ph (604) 930-3551	ROCKY RAPIDS Box 61 Drayton Valley AB T0E 1Z0	Ph (780) 542-0787
EDMONTON TRAILER SALES 16830-111 Avenue Edmonton AB T5M 2S6	Ph (780) 413-6030	TRU-KARE TANK AND METER SERVICE LTD. RR1 Site 2 Box 2 Lacombe AB T0C 1S0	Ph (403) 782-1811
GBM TRAILER SERVICE LTD. 8516-40 Street S.E. Calgary AB T2P 2G6	Ph (403) 279-9717		
GOLDEC INT'L EQUIPMENT INC.(Hamm's Tanks) 6760-65 Avenue Red Deer AB T4P 1A5	1-800-661-1665 Ph (403) 343-6607		
HOTROD MACHINING INC. Box 253 High Level AB T0H 1Z0	Ph (780) 926-4944		

Distributors

FABMASTER 4313-76 Avenue Edmonton AB T6B 2H7	Ph (780) 461-8111
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American Dealer List

ADVANCED TANK SYSTEMS
301 Enterprise Lane
Colmar PA 18915 Ph (215) 822-1336

BEALL TRAILERS OF COLORADO INC.
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Commerce City CO 80022 Ph (303) 289-3149

BEALL TRAILERS OF MONTANA INC.
1430 Highway 87 East
Billings MT 59103 Ph (406) 252-7163

BEALL TRAILERS OF NORTH DAKOTA INC.
537 – 27th Avenue East
Dickinson ND 58601 Ph (701) 225-4441

BEALL TRAILERS OF OREGON INC.
9200 N Ramsey Blvd
Portland OR 97203 Ph (503) 286-8823

BLUE STREAK WELDING
PO Box 275
Slanesville WV 25444 Ph (304) 822-8876

BRENNER TANK
PO Box 670
Fond Du Lac WI Ph (920) 922-4530

BULLZEYE TANK SERVICE
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ENERGY FABRICATION INC.
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Odessa TX 79764 Ph (915) 362-0591

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HEIL TRAILER
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Fort Worth TX 76131 Ph (817) 232-0900

HY-TEC INC.
51 Industrial Circle
Lancaster PA 17601 Ph (717) 656-4329

KERSTEN TRAILER SALES
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Henderson CO Ph (303) 287-2891

MacCLASKEY OILFIELD SERVICES
5900 W Carlsbad Highway
Hobbs NM 88241 Ph (505) 393-1016

RAMPMASTER
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Coatesville PA 19320 Ph (610) 857-1900

RUSH SALES COMPANY
2700 E. I-20 PO Box 2488
Odessa TX 79760 Ph (915) 337-2397

SEMI SERVICE INC.
1082 South 300 West
Salt Lake City UT 84115 Ph (801) 521-0360

SOONER GREAT DANE
5204 I-40 West
Oklahoma City OK 73128 Ph (405) 946-9907

STEPHANS PNEUMATIC INC.
147 County Road 4840
Haslet TX 76652 Ph (817) 636-9004

SUPERIOR TRUCK & TRAILER
4705 McGee Road
Greenwood LA 71033 Ph (318) 938-5492

TRANSTECH INDUSTRIES
42 Coffin Avenue
Brewer ME 04412 Ph (207) 244-9611

UTILITY TRUCK & EQUIPMENT
1432 Broad Street 1-800-256-8832
Lake Charles LA Ph (337) 433-5361

Distributors

ARMSTRONG EQUIPMENT SERVICE
1002 N. Parker Street 1-800-699-7557
Orange CA 92867 Ph (714) 289-7600

TANK TRAILER SPECIALTY EQUIP. CO. INC.
5733 Ransom Street
Houston TX 77087 Ph (713) 641-4255