

SEELEVEL II™

Tank Fluid Monitor

MODEL 903-D6 MOD COMMUNICATION BOARD MANUAL

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SEELLEVEL II™

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MODEL 903-D6 MOD

Version 1.0.8

COMMUNICATIONS BOARD MANUAL

The 903D6 MOD communication board uses a proprietary Garnet Instruments format for wireless communication and industry standard Modbus RTU communications for RS232, RS485, or RS422 hardware interfaces.

To enable communications from the 900D6 display to the communication board the serial data transfer in the 900D6 display must be turned on through the configuration menus using the 6 digit security code menu. ("SERoL" set to "On")

The communication settings used in all modes is 9600 baud, 8 bits, 1 stop bit, and parity set to None.

The communications hardware interface must be configured for RS232, RS485, RS422, or wireless communications in the 900D6 display and with the serial jumpers on the 903D6 MOD communication board. In the 900D6 display enter the configuration menu using the 6 digit Master Code and configure the SERIAL CONFIGURATION MENU. Select either "**rS.485**", "**rS.232**", or "**rAdio**". The "**rS.485**" selection is used for both RS485 and RS422 communications. Move the two serial jumpers on the 903D6 MOD communication board to corresponding 485, 422, or 232 positions.

An additional termination jumper on the 903D6 MOD communication board also needs to be set correctly if using RS485 or RS422. This jumper needs to be set on the end nodes of the RS485 or RS422 bus. This allows multiple 900D6 displays to be connected together communicating back to a single Modbus Master device such as a PLC or a PC running the Garnet Tank Monitoring software.

The Modbus Slave Address is configured in the 900D6 display through the configuration menus using the 4 digit security code menu. Tank 1 ID from the 900D6 sets the Modbus Slave Address for the 903D6 MOD communication board.

Communication Mode	Tank 1 ID	Modbus Slave Address
Wireless*	0-8000	
RS-232	1-255	1-255
RS-485/RS-422	1-255	1-255

* To conserve battery life, the wireless communication mode does not use Modbus communications, but rather uses a proprietary Garnet Instruments format which allows data updates to occur using Report by Exception (RBE). Report by Exception allows data update to occur whenever an inch, level, temperature, or an analog value changes. Scheduled data updates also occur on a regular timed interval. The Garnet Instruments Tank Monitoring software has been developed to be used with the 900D6 running in the wireless communication mode.

External power (6-24 VDC) must be supplied to power the 903D6 MOD communication board when using RS232, RS422, or RS485 communication modes. When using the Wireless communication mode, the 900D6 display and the 902D6 WIR Communication Board, will use battery power from four D cell batteries.

The following Modbus RTU functions are supported by the 903D6 WIR communication board.

Supported Modbus Function codes

Description	Modbus RTU Function Code
Read coils	01
Read discrete inputs	02
Read holding registers	03
Read input registers	04
Write single coil	05
Write single register	06
Read exception status	07
Write multiple coils	15
Write multiple registers	16
Report slave id	17

Reading the input registers allows access to the complete set of 900D6 available data.

Supported Input Registers

Description	Range	Units	Register
Software version	113	(example)	30001
Bit Packed Alarms (bits 1-4)	0-15		30002
Reserved			30003
Reserved			30004
Reserved			30005
D6 Display Type	0x10=Single 0x04=Dual 0x08=Triple 0x0C=Quad		30006
D6 Battery Level	1=Poor 2=Fair 3=Good		30007
Counter			30008
Tank 1 Identification high bytes			30009
Tank 1 Identification low bytes			30010
Tank 1 Level high bytes		10 th of an Inch	30011
Tank 1 Level low bytes		10 th of an Inch	30012
Tank 1 Volume high bytes		D6 display value without decimal	30013
Tank 1 Volume low bytes		D6 display value without decimal	30014
Tank 1 Volume Decimal Position	0-5		30015
Tank 1 Temperature*	-40 to 140 -40 to 90	Deg F Deg C	30016
Sender 1 Status	0=Good Light 2=No Light 3=Bad Light		30017
Sender 1 Battery Level	1=Poor 2=Fair 3=Good		30018
Tank 2 Identification high bytes			30019
Tank 2 Identification low bytes			30020

Tank 2 Level high bytes		10 th of an Inch	30021
Tank 2 Level low bytes		10 th of an Inch	30022
Tank 2 Volume high bytes		D6 display value without decimal	30023
Tank 2 Volume low bytes		D6 display value without decimal	30024
Tank 2 Volume Decimal Position	0-5		30025
Tank 2 Temperature*	-40 to140 -40 to 90	Deg F Deg C	30026
Sender 2 Status	0=Good Light 2=No Light 3=Bad Light		30027
Sender 2 Battery Level	1=Poor 2=Fair 3=Good		30028
Tank 3 Identification high bytes			30029
Tank 3 Identification low bytes			30030
Tank 3 Level high bytes		10 th of an Inch	30031
Tank 3 Level low bytes		10 th of an Inch	30032
Tank 3 Volume high bytes		D6 display value without decimal	30033
Tank 3 Volume low bytes		D6 display value without decimal	30034
Tank 3 Volume Decimal Position	0-5		30035
Tank 3 Temperature*	-40 to140 -40 to 90	Deg F Deg C	30036
Sender 3 Status	0=Good Light 2=No Light 3=Bad Light		30037
Sender 3 Battery Level	1=Poor 2=Fair 3=Good		30038
Tank 4 Identification high bytes			30039
Tank 4 Identification low bytes			30040
Tank 4 Level high bytes		10 th of an Inch	30041

Tank 4 Level low bytes		10 th of an Inch	30042
Tank 4 Volume high bytes		D6 display value without decimal	30043
Tank 4 Volume low bytes		D6 display value without decimal	30044
Tank 4 Volume Decimal Position	0-5		30045
Tank 4 Temperature*	-40 to140 -40 to 90	Deg F Deg C	30046
Sender 4 Status	0=Good Light 2=No Light 3=Bad Light		30047
Sender 4 Battery Level	1=Poor 2=Fair 3=Good		30048

* Register values are stored as 16-bit signed integers.

Holding registers 40001-40016 have been reserved for Garnet use.
Holding registers 40017-40064 are read only.

Supported Holding Registers

Description	Range	Units	Register
Reserved			40001
Reserved			40002
Reserved			40003
Reserved			40004
Reserved			40005
Reserved			40006
Reserved			40007
Reserved			40008
Reserved			40009
Reserved			40010
Reserved			40011
Reserved			40012
Reserved			40013
Reserved			40014
Reserved			40015
Reserved			40016
Software version	113	(example)	40017
Bit Packed Alarms (bits 1-4)	0-15		40018
Reserved			40019
Reserved			40020
Reserved			40021
D6 Display Type	0x10=Single 0x04=Dual 0x08=Triple 0x0C=Quad		40022
D6 Battery Level	1=Poor 2=Fair 3=Good		40023
Counter			40024
Tank 1 Identification high bytes			40025
Tank 1 Identification low bytes			40026
Tank 1 Level high bytes		10 th of an Inch	40027
Tank 1 Level low bytes		10 th of an Inch	40028

Tank 1 Volume high bytes		D6 display value without decimal	40029
Tank 1 Volume low bytes		D6 display value without decimal	40030
Tank 1 Volume Decimal Position	0-5		40031
Tank 1 Temperature*	-40 to 140 -40 to 90	Deg F Deg C	40032
Sender 1 Status	0=Good Light 2=No Light 3=Bad Light		40033
Sender 1 Battery Level	1=Poor 2=Fair 3=Good		40034
Tank 2 Identification high bytes			40035
Tank 2 Identification low bytes			40036
Tank 2 Level high bytes		10 th of an Inch	40037
Tank 2 Level low bytes		10 th of an Inch	40038
Tank 2 Volume high bytes		D6 display value without decimal	40039
Tank 2 Volume low bytes		D6 display value without decimal	40040
Tank 2 Volume Decimal Position	0-5		40041
Tank 2 Temperature*	-40 to 140 -40 to 90	Deg F Deg C	40042
Sender 2 Status	0=Good Light 2=No Light 3=Bad Light		40043
Sender 2 Battery Level	1=Poor 2=Fair 3=Good		40044
Tank 3 Identification high bytes			40045
Tank 3 Identification low bytes			40046
Tank 3 Level high bytes		10 th of an Inch	40047

Tank 3 Level low bytes		10 th of an Inch	40048
Tank 3 Volume high bytes		D6 display value without decimal	40049
Tank 3 Volume low bytes		D6 display value without decimal	40050
Tank 3 Volume Decimal Position	0-5		40051
Tank 3 Temperature*	-40 to 140 -40 to 90	Deg F Deg C	40052
Sender 3 Status	0=Good Light 2=No Light 3=Bad Light		40053
Sender 3 Battery Level	1=Poor 2=Fair 3=Good		40054
Tank 4 Identification high bytes			40055
Tank 4 Identification low bytes			40056
Tank 4 Level high bytes		10 th of an Inch	40057
Tank 4 Level low bytes		10 th of an Inch	40058
Tank 4 Volume high bytes		D6 display value without decimal	40059
Tank 4 Volume low bytes		D6 display value without decimal	40060
Tank 4 Volume Decimal Position	0-5		40061
Tank 4 Temperature*	-40 to 140 -40 to 90	Deg F Deg C	40062
Sender 4 Status	0=Good Light 2=No Light 3=Bad Light		40063
Sender 4 Battery Level	1=Poor 2=Fair 3=Good		40064

The status of the four alarms in the 900D6 can be read by reading the following discrete inputs. The remaining discrete inputs have been reserved for future use.

Supported Discrete Inputs

Description	Discrete Input (1-4)
Alarm 1	10001
Alarm 2	10002
Alarm 3	10003
Alarm 4	10004
Reserved	10005
Reserved	10006
Reserved	10007
Reserved	10008

Printed in Canada

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