

Level Plus[®]

Liquid-Level Sensors
With Temposonics[®] Technology



M-Series Model MG with Digital Output
Combined new features - setup software and firmware

551044 A

Technical Tip

ADDED FEATURES:

- MTS has added some advanced features to our newer Model MG transmitters with firmware revision v3.19 or higher.
- With the advanced features, MTS also updated the M-Series Digital Setup Software to v3.09 or higher which will allow access these features.

REQUIREMENTS:

- M-Series Modbus Setup Software version 3.09 or higher.
- Firmware revision of 3.19 or higher.
- Transmitters shipped after 1/2008 has the latest firmware
- Software updates available at:
<http://www.mtssensors.com/vault/index.html>

M-Series Model MG
Digital Transmitters



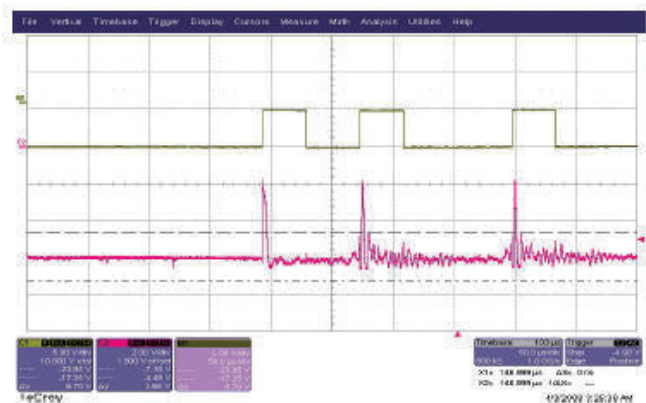
Technical Tip Overview

This Technical Tip explains the added functionality with firmware revision 3.19 or higher and M-Series Digital Setup Software 3.09 or higher.

Picture Parameters

An interrogation pulse is placed on the magnetostrictive transmitter sensing element that will receive a return signal from each float present. An example of our interrogation is shown in the graphic on below. In the graphic, the magenta line is the interrogation pulse and the return pulses for the product and interface floats. The pulses from left to right are the interrogation pulse, the product float return pulse, and the interface float return pulse. Our electronics convert the interrogation into square waves for processing as shown by the yellow square wave, known as the comparator pulse.

When converting from the magenta pulses to the yellow square waves we set several variables including the Gain, Sara Blanking, Magnet Blanking, Delta, and Minimum Trigger Levels. Some of these variables were previously inaccessible in the field by users. Below is a description of what these variables do and how to adjust them.



Factory software settings and feature accessibility

These new features are accessible in two different places. The Gain, Magnet Blanking, and Delta variables are accessible from the Data form Device Tab on the Setup Software under the Adjust button and are password protected, ~mtsdda~. The other variables are only accessible when the Factory version of the Setup Software is enabled.

To enable access to the factory settings, go to the actual exe file located on your C drive listed under Program Files and MTS Sensors and create a shortcut. Right click on the shortcut to pull up the properties. Under the target window you will see the following data.

Modbus:

"C:\Program Files\MTS Sensors\ModbusConfig\ModbusConfig.exe"

DDA:

"C:\Program Files\MTS Sensors\DDAConfig\DDAConfig.exe"

Place your cursor to the right of the closing quotation mark then spacebar one time, forward slash, Capital F, colon, and the number 1 key then press the apply button.

Your target line should be the same as below after modification.

Modbus:

"C:\Program Files\MTS Sensors\DDA Level Config\DDAConfig.exe" /F:1

DDA:

"C:\Program Files\MTS Sensors\DDA Level Config\DDAConfig.exe" /F:1

Variables

You can use The following Modbus/DDA software interface functions to perform the following adjustments:

GAIN:

The Gain is a setting that controls how large of an interrogation pulse we place on the sensing element. We adjust the Gain setting according to how long the transmitters. We calibrate the signal strength from the factory to insure there is enough amplitude for the electronics to process the signals yet keeping the noise to a minimum. Below is a list of nominal gains for the gauge lengths. When adjusting the Gain settings, the trigger level at the tip of the probe should be above 50 and the trigger level at the head of the probe should be below 150. These are suggestions and will vary. Power has to be reset for the changes in Gain to take effect.

Note:

Power has to be reset for the change to take effect

DDA TRANSMITTER GAIN VALUES:

Transmitter length:	Before 12/01/02	After 12/01/02	After 12/1/05
0 to 100 inches	8 (70)	D (C0)	E (D0)
101 to 200 inches	4 (30)	C (B0)	D (C0)
201 to 350 inches	3 (20)	A (70)	B (90)
351 to 500 inches	2 (10)	7 (50)	9 (60)
501 and above	1 (05)	5 (40)	7 (50)

Variables (continued)

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SARA BLANKING:

Sara blanking establishes the blanking window on the interrogation pulse only. After all of the pulses a blanking window is set so the electronics do not trigger on the ringing of the pulse. Rigid transmitters up to 25 feet will have a setting of 25 and the longer flexible transmitters will have a setting of 40. The long transmitters are set for a longer time as we are pushing more current down the sensing element and consequently creating more noise or ringing

MAGNET BLANKING:

Magnet blanking establishes the blanking window around the float signals; the window needs to be wide enough to eliminate the ringing after the initial pulse but small enough so that if the floats were to get close enough to touch the electronics would still recognize both floats. Rigid transmitters will have a setting of 25 and flexible transmitters will have 40.

DELTA:

The Delta function is handled differently between both versions of protocol. In Modbus the electronics will sample the readings internally up to three times and each reading must fall within the set delta before the electronics will output the new value. If all three readings are not within this delta the electronics will keep sampling until this condition is met while outputting the last good value.

With DDA the number of readings is adjustable but it is not recommended to go above 4 samples as the electronics may not update if the tank is in a highly agitated condition. Also the deltas can be set independently if required and functions the same as Modbus in establishing a window that all reading must match. A unique feature with DDA is that if the magnet blanking is set to 50 or above the delta numbers become the maximum possible reading the transmitter will ever output. This is helpful in rapidly moving tanks where random water spikes could occur because of the enormous product float movement outside of its blanking window causing the electronics to think it saw two floats next to each other.

MINIMUM TRIGGER LEVEL:

This setting is found on the factory tab and functions as a window to keep out the noise. The number represents the minimum amount of return signal that is required for the electronics to process and give the output. If the minimum trigger is set for 25 then the bottom float must read at least 35 for the float position to be outputted, if the number is lower than 35 and closer to 25 then the transmitter will report a missing magnet error. This window also helps to control the noise and should always be set to a value of 25 this will ensure the window is large enough for the noise not to interfere with the return signals. The ideal trigger level for the water float at the bottom

Variables (continued)

of the transmitter should read between 50 to 70. In this instance we will have twice as much signal as needed for the transmitter to operate. These trigger levels will increase as the floats are moved up the transmitter. However if the gain is set too high then the top float signal will constantly jump around because the comparator can't distinguish between the real float signal and the ringing noise outside its blanking window.

Part Number: 05-08 551044 Revision A

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UNITED STATES
MTS Systems Corporation
Sensors Division

3001 Sheldon Drive
Cary, NC 27513
Tel: (800) 633-7609
Fax: (919) 677-0200
(800) 498-4442
www.mtssensors.com
sensorsinfo@mts.com

GERMANY
MTS Sensor Technologie
GmbH & Co. KG

Auf dem Schüffel 9
D - 58513 Lüdenscheid
Tel: +49 / 23 51 / 95 87-0
Fax: +49 / 23 51 / 56 491
www.mtssensor.de
info@mtssensor.de

JAPAN
MTS Sensors Technology
Corporation

Ushikubo Bldg.
737 Aihara-cho, Machida-shi
Tokyo 194-0211, Japan
Tel: +81 (42) 775 / 3838
Fax: +81 (42) 775 / 5516
www.mtssensor.co.jp
info@mtssensor.co.jp