NATIONAL TYPE EVALUATION PROGRAM

Certificate of Conformance
for Weighing and Measuring Devices

For:
Indicating Element
Digital Electronic, Radio Frequency Transmitter/Receiver
Model: MSI-3750CS, MSI-9000, MSI-9020,
        MSI-9750A, and MSI-9850
n_{max}: 10 000
Accuracy Class: III/III L

*Submitted By: Contact Info. Updated: November 2012
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Standard Features and Options

Numeric LCD display (MSI-3750CS)
Gross/net weight display
AC power supply
Motion detection annunciator
Semi-automatic (push-button) tare
Center of zero annunciator
Keyboard tare
Alphanumeric LCD display (MSI-9750A, MSI-9850)
Semi-automatic (push-button) zero setting mechanism (SAZSM)

Print capability
External unit selection (lb, kg, tons, metric tons)
Automatic zero setting mechanism (AZSM)
Initial zero setting mechanism (IZSM)
Dual scale interface
Summing capability
Short range antenna (2.4 Ghz spread spectrum)

Model Characteristics:
MSI-9000 contains all indicator features and functions, A/D converter and sealing provisions
MSI-9020 modem for receiving and transmitting MSI-9000 information to remote displays and printers
MSI-3750CS (fixed mount) and MSI-9750A (hand-held remote), keyboard and display
MSI-9850 (fixed mount), keyboard and dual display remote indicator

Options:
AC/DC voltage operation
9 VDC to 30 VDC battery operation, 9-24 VDC (MSI-9850 only)
RS232/422, and 4-20 mA output

Temperature Range: -10 °C to 40 °C (14 °F to 104 °F)

This device was evaluated under the National Type Evaluation Program and was found to comply with the applicable technical requirements of "NIST Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

Stephen Benjamin
Chairman, NCWM, Inc.

Kurt Floren
Committee Chair, National Type Evaluation Program Committee
Issued: July 26, 2007

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Measurement Systems International (MSI)

Indicating Element / MSI-3750CS, MSI-9000, MSI-9020, MSI-9750A, and MSI-9850

Application: General purpose indicating element to be interfaced with approved and compatible weighing/load receiving elements.

Identification: Identification information is located on a metal tag riveted to each device.

Sealing: The Model MSI-9000 transmitter may be sealed with a wire security seal threaded through two screws with holes in them. One is on the front panel and the other is on the outside edge. The screw on the outside edge prevents access to the calibration switch located inside. Calibration is performed using the keyboard of the Model MSI-3750CS, MSI-9850 or the MSI-9750A.

The MSI-3750CS may be sealed with a wire security seal threaded through a screw with a hole in it and a hole on the front panel of the device. The screw prevents access to the calibration switch located inside. The MSI-9000 calibration switch must be pressed (activated) prior to pressing the MSI-3750CS calibration switch, to gain access to the indicating elements configuration and calibration parameters.

Approved weighing elements are sealed according to the instructions listed on their respective certificates.

Operation: The system is designed to transmit and receive weight information using radio frequencies from a weighing element connected to the MSI-9000 module to remote indicators (MSI-3750CS, MSI-9850 or MSI-9750A) that are tuned to the same frequency as the MSI-9000. The system may be comprised of some or all of the following components:

MSI-9000: Primary weight processing module that contains the analog to digital (A/D) converter and all indicating element functions: motion detection, overload and behind zero sensing, zero setting mechanisms, data transmission via RS232/422 (for printer or computer interfacing), and data storage (weighing transaction information). The radio frequency (RF) transmitter and receiver are located in the module. All calibration and weighing element parameters are stored and sealed in the MSI-9000 module.

Calibration and parameter setting is accomplished remotely using the MSI-9750A hand-held remote indicator, the MSI-3750CS, MSI-9850 fixed mount indicator, or by using Measurement Systems International scale interfacing software and a computer interfaced to the MSI-9000 communication port.

MSI-9750A: Hand-held remote indicator. The hand-held remote indicator displays weight information from the weighing element(s) interfaced to the MSI-9000. Information transmitted from the MSI-9000 may include but is not limited to, weight data, customer data, stored tare information, and summed weights information. The remote can display weight information for up to four weighing elements. The MSI-9750A is equipped with a full keyboard and may be used to control all of the MSI-9000 indicating element features.

Calibration access is permitted if the MSI-9000 calibration switch has been accessed and pressed (activated).

MSI-3750CS: Fixed mount remote indicator. The fixed mount remote indicator displays weight information from the weighing element(s) interfaced to the MSI-9000. Information transmitted from the MSI-9000 may include, but is not limited to, weight data, customer data, stored tare information and summed weights information. The MSI-3750CS is equipped with a full keyboard and may be used to control all of the MSI-9000 indicating element features. Provisions for sealing are provided to prevent access to the calibration features of the MSI-9000 module.

Calibration may be performed if the MSI-9000 calibration switch has been accessed and pressed (activated).

MSI-9850 Fixed mount remote indicator. The MSI-9850 fixed mount remote indicator displays weight information from the MSI-6260CS or the MSI-9300 crane scales (Certificate of Conformance Number 07-007). Information transmitted from the crane scales may include weight data, customer data, stored tare information, and summed weight information. The MSI-9850 shares features of the MSI-9750A, with the addition of a second LED display. The MSI-9850 can display weight information for up to four weighing elements. The MSI-9850 is equipped with a full keyboard and may be used to control all of the MSI-9000 indicating element features. The MSI-6260CS and MSI-9300 are fully controlled by the MSI-9850.

MSI-9020: Modem: The modem receives data from the MSI-9000 and may transmit the information to a remote score board, printer or to other peripheral devices via its communication port. There are no metrologically significant components contained in the modem.

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NOTE: When the system (MSI-9000 and remote display) is set up in a legal for trade mode (Handbook 44 compliant) the system will only respond to commands from one remote display. The primary remote display is selected at the time of calibration. This is not a sealable parameter and other remotes may be called upon by the operator to function as the primary remote display, however only one remote display may transmit commands to the MSI-9000 at any given time.

Test Conditions: This certificate supersedes Certificate of Conformance Number 05-077 and is issued to add the Model MSI-9850 fixed mount and dual display remote indicating element. The emphasis of the evaluation was on device design, performance, marking requirements, and distance of indication capability. A second Model MSI-9850 digital weight indicator (operating at a different frequency) was placed nearby to check for interference between weight indications. The indicators submitted were interfaced (via RF) with two Model 9300 crane scales (Certificate of Conformance Number 07-007). Several increasing/decreasing load tests were performed from zero to capacity and indications from the crane scales were matched with those of the remote weight indicators. The indicator was also interfaced to a printer to verify print function capabilities. Previous test conditions are listed below for reference.

Certificate of Conformance Number 05-077: The Models MSI-9000 (primary weight processing module), MSI-9020 (modem), MSI-3750 (fixed mount display), and MSI-9750A (hand-held remote) were submitted for evaluation. The emphasis of the evaluation was on device design, performance, marking requirements, and compliance with influence factor requirements.

The indicators were submitted for evaluation and interfaced with a load cell simulator. Several increasing/ decreasing load tests were performed over a temperature range of -10 °C to 40 °C (14 °F to 104 °F) and with line voltages of 100 VAC and 130 VAC. The indicator was also interfaced with a weighing element and printer for zero, zone of uncertainty, discrimination, motion detection, and printing tests. The remote display functions were also evaluated.

Evaluated By: D. Parks (CA), G. Castro (CA) 05-077, S. Boyd (CA) 05-077A1

Type Evaluation Criteria Used: *NIST Handbook 44 Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices*, 2007 Edition. *NCWM Publication 14 Weighing Devices*, 2007 Edition.

Conclusion: The results of the evaluation and information provided by the manufacturer indicate the device complies with applicable requirements.

Information Reviewed By: J. Truex (NCWM)

Example(s) of Device:

MSI-9850

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Example(s) of Device (continued):

MSI-9750A

MSI-9000

MSI-3750CS

Sealing Screws