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Research, Development and Manufacturing of Precision Measuring Systems

LMI 585



INSTRUCTION MANUAL

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LMI 585 DIGITAL TRANSMITTER

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LMI 585 DIGITAL TRANSMITTER

1 **INTRODUCTION**

- The LMI 585 Digital Transmitter is a compact device with an LCD display for use with any LMI transducer. This battery operated transmitter has the ability to store multiple gage calibrations and eliminates unstable readings.
- The LMI 585 has a RS-232 compatible serial connection which may be cabled to a portable data collection device or a PC.

2 **BATTERY**

- The LMI 585 is powered by an Alkaline type 9-volt or a Lithium type battery (Alkaline type included). The Alkaline type battery has up to forty hours of life under normal usage; the life of the Lithium type is approximately twice that of the Alkaline type battery.
- Note: If the LED indicator light is continuously left on while the LMI 585 is not being used, the life of the battery is significantly reduced.

2.1 **LOW BATTERY INDICATOR**

- A “BAT” indicator will appear in the upper right-hand corner of the display when the battery is nearing the end of its life. The LMI 585 will operate at full accuracy under low battery conditions but will shutdown if the battery reaches a critical low level. This insures no corrupt data will be displayed or transmitted.
- If the battery is replaced before complete shutdown, all parameters will be saved, as long as the new battery is installed within thirty seconds of removal of the old battery.

2.2 **AUTOMATIC POWER-DOWN**

- The LMI 585 will automatically power-down (turn off) after 10 minutes of no activity. All calibration information and stored data values will be retained. Note: The LMI 585 will not automatically power-down if a gage is not connected.

3 **CONNECTIONS**

- There are three modular style connectors on the LMI 585. The 4-pin connector supports both standard LMI surface probes and LMI Flush & Gap transducers. The 6-pin connector is for the LMI 241 Flush & Gap Gage and True Position Gages. The 8-pin connector is used as the RS-232 connection for interfacing with a PC or data collector (see Section 5.2 Communications).

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4 OPERATION

NOTE:

Do not use sharp objects (pen, pencil, etc) to push the buttons on the keypad of the 585. This could damage the unit and void the warranty

4.1 KEYPAD FUNCTIONS

I/O:

On or Off

SEND:

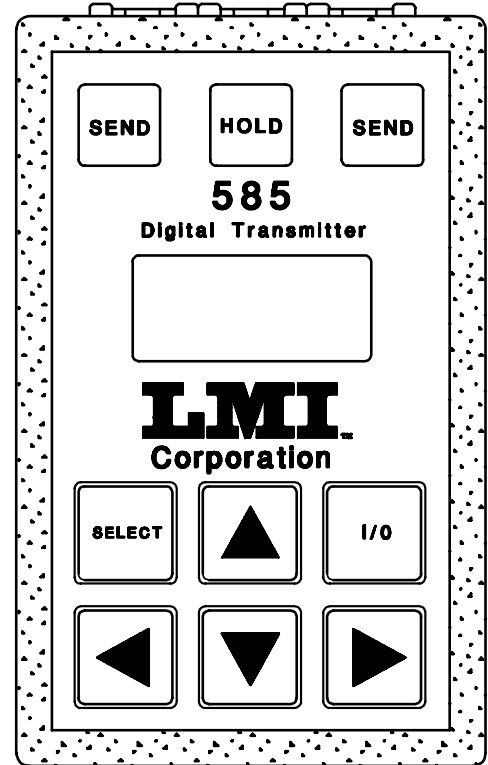
Data transmission of current gage reading shown on display or return to Normal Operation display

HOLD:

Freeze or “un”-freeze the current gage reading shown on display

SELECT:

Select a sub-menu option or toggle between master points of active gage calibration



RIGHT/LEFT ARROW KEYS:

Access and scroll through menu and sub-menu choices; left arrow key to return to the previous menu location

UP/DOWN ARROW KEYS:

Access and scroll through menu and sub-menu choices

4.2 NORMAL OPERATING MODE

1. Connect the LMI 585 and the gage, using the appropriate cable and connector site.
2. Connect the LMI 585 and a PC or data collector, using the LMI 6019 Interface Cable (optional).
3. Use I/O key to turn unit on. Display will temporarily read: LMI 585 VER 2.04
4. Use the left arrow key to view calibration readings or to select the desired gage type for normal operation. If the Auto Select option has been activated, the LMI 585 will automatically detect a Flush & Gap type gage and advance to the 1F port. (See Section 5.3.3 to activate Auto Select.)

Gage Types: 1P = Probe (default)
1F = Flush & Gap
2F = Simultaneous Flush & Gap
2G

5. Insert the gage into the selected check point on the check fixture.
6. The green LED light will indicate a stable reading. (See Section 5.3.2A to activate indicator light).

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7. Press “SEND” to transmit reading.

4.3 QUICK ZERO

Any calibrated gage can be re-mastered quickly by pressing the HOLD key for two seconds, until MASTER appears on the display. The gage’s master position in the LMI 585 will be adjusted to the gage’s current position.

5 MAIN MENU

1. Use the up or down arrow key to scroll through the Main Menu options:

Calibration	(CAL	>)
Communications	(COMM	>)
Advanced Functions	(ADVANCED	>)

2. Use the right arrow key to access the sub-menu (a “>“ will appear on the right side of the display screen to prompt the user to a sub-menu option).

3. Once within a sub-menu, use the up or down arrow keys to scroll through sub-menu options.

4. Press the SELECT key to choose an option.

5. Use the left arrow key to return to a previous menu level.

6. Press the SEND key, at any time, to return to Normal Operation

5.1 CALIBRATION MENU

The LMI 585 supports three separate gage calibrations. In order to calibrate the LMI 585 to a gage, the user must enter at least three data points into the transmitter. These points are referred to as “Low Cal”, “High Cal”, and “Master”, the zero point (the operator is prompted to enter a second master point when using a Flush & Gap transducer).

USE THE QUICK-CALIBRATION INSTRUCTIONS, AT THE BACK OF THIS MANUAL, FOR STEP-BY-STEP INSTRUCTIONS ON CALIBRATING SPECIFIC GAGES.

5.1.2 CALIBRATION SUB-MENUS

PORT 1P >	LOW CAL	PORT 1F >	LOW CAL	PORT 2F >	LOW CAL
	HI CAL		HI CAL		HI CAL
	MASTER		MASTER 1 F		MASTER
			MASTER 1 G *	PORT 2G>	LOW CAL
					HI CAL
					MASTER *

- **NOTE:** At the Master calibration step for gap, a numeric value of 00.000mm (Metric) or 0.000” (English) will be displayed. Readings will reflect the deviation from zero. To reflect the actual gage, the operator can adjust the value to a maximum limit of 50.000mm (Metric) or 1.9686” (English) by using the up or down arrow keys to increase or decrease a digit value to the right of the decimal point or by using the right or left arrow keys to increase or decrease the digit value to the left of the decimal point.

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5.1.3 REVERSE SIGNS

The LMI 585 establishes direction during calibration. The direction can be changed by the operator; see the Quick Calibration Instructions at the back of this manual for step by step instructions.

5.2 COMMUNICATIONS MENU

The LMI 585 can transmit “ASCII Characters” to a remote device via the RS-232 connection. Enter the Communications Menu to select a pre-programmed format under the EXPORT sub-menu. The format selected will be determined by the remote device in use.

Turn the RS-232 connection on or off under the ON/OFF sub-menu. The option that is currently selected is indicated by the flashing first character.

5.2.1 COMMUNICATIONS SUB-MENUS:

Use the Export sub-menu to select the desired transmission format. Once the format is SELECTED, the operator has the option to transmit the gage labels as well. The transmission capability can be turned on (default) or off.

Use the right arrow key to access sub-menu; use the up or down arrow keys to access sub-menu options; use the SELECT key to choose the desired option.

EXPORT > EXPORT 1	EXPORT 1 LABEL ON	EXPORT 2 LABEL ON	ON/OFF > ON
EXPORT 2	OFF	OFF	OFF

Pre-programmed Formats:

EXPORT 1

Message Format	Metric -xx.xxx(CRLF)	English -x.xxxx(CRLF)
Character Format	4800 baud, 8 data bits, no parity, 1 stop bit	

EXPORT 2

Message Format	Metric =+/-xx.xxxmm(TAB)	English =+/-x.xxxxin(TAB)
Character Format	4800 baud, 8 data bits, no parity, 1 stop bit	

5.3 ADVANCED FUNCTIONS MENU

The LMI 585 Transmitter supports a variety of setup choices to allow the operator to customize the unit according their specific requirements. Custom choices include auto or manual reading, gage labeling, calibration span, auto gage detection, flush and gap toggling, and choice of Metric or English readings. Note that the selected options in the ADVANCED menu will be indicated by the flashing first character.

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5.3.1 ADVANCED FUNCTIONS SUB-MENUS:

Use the “Up” or “Down” arrow keys to move from option to option; use the right arrow key to select an option.

PORT 1A >
PORT 2A >
PORT 2B >
F/G TGL >
UNITS >

5.3.2 PORT 1A SUB-MENU:

READ >
LABEL >
CAL SPAN >

5.3.2A READ:

Use the right arrow key to access the READ sub-menu.. Use the up or down arrow key to access options; press SELECT at the desired option.

MANUAL (default) :

In MANUAL READ mode, the green LED light will indicate a stable reading; only when the reading is stable, the operator can transmit the reading by pressing the SEND key. (The Dwell Range defaults at 0.01mm or 0.0004” and the Dwell Rate defaults at .05 seconds. The operator can change the Dwell Range by: (1) pressing the right arrow key at MANUAL, and (2) using the up or down arrow keys to change the value. (3) Press SELECT to set the desired value. (4) The display will automatically advance to the Dwell Time; use the up or down arrow keys to change the value. (5) Press SELECT to set the desired value.)

AUTO:

In AUTO READ mode, the green LED light will indicate a stable reading, which will automatically be transmitted. (The Dwell Range defaults at 0.01mm or 0.0004” and the Dwell Rate defaults at .05 seconds.) The operator can change the Dwell Range by: (1) pressing the right arrow key at AUTO, and (2) using the up or down arrow keys to change the value. (3) Press SELECT to set the desired value. (4) The display will automatically advance to the Dwell Time; use the up or down arrow keys to change the value. (5) Press SELECT to set the desired value.

OFF:

In OFF READ mode, the green LED light will not indicate a stable reading. The operator can transmit a reading at any time during the reading.

5.3.2B LABEL:

Use the right arrow key to access the LABEL sub-menu.. The operator can use P (default), X, Y, Z, A, B, F, or G as the gage label for PORT 1A. Use the up or down arrow key to access options; press SELECT at the desired option.

5.3.2C CAL SPAN:

Use the right arrow key to access the CAL SPAN sub-menu. The calibration span will default to 10.000mm (Metric) or 0.3938” (English). The operator can adjust the calibration span by using the up or down arrow keys (adjustable to 50.000mm (Metric) or 1.9686” (English)); press SELECT at the desired value.

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Note: Most LMI gages have a 10.000mm span; no adjustment to CAL SPAN is required. Use of an incorrect CAL SPAN will cause erroneous readings.

5.3.3 PORT 1B SUB-MENU

READ >
LABEL >
CAL SPAN >
AUTO SEL >

5.3.3A READ:

See Section 5.3.2A.

5.3.3B LABEL:

Use the right arrow key to access the LABEL sub-menu.. The operator can use F/G (default), G/F, A, B, F, G, P, X, Y, OR Z as the gage label for PORT 1B. Use the up or down arrow key to access options; press SELECT at the desired option. If gage label F/G,G/F, F or G are selected, the operator will be prompted to determine if the sign should be normal (+ when extended/-when retracted) or reversed. Use the up or down arrow key to access options and press SELECT at the desired option. See the Quick Calibration Instructions at the back of this manual for step-by-step instructions.

5.3.3C CAL SPAN:

See Section 5.3.2C.

5.3.3D AUTO SEL:

Use the right arrow key to access the AUTO SEL sub-menu. Use the up or down arrow key to access options; press SELECT at the desired option..

MANUAL (default):

In the AUTO SEL-MANUAL mode, the user must identify the gage type being used by selecting the appropriate port in normal operating mode.

AUTO:

In AUTO SEL-AUTO mode, the LMI 585 will detect the gage type being used (if using an LMI Flush & Gap gage manufactured since 1996) when the gage is connected; the gage type will revert to the default gage port (1P) when the Flush & Gap gage is disconnected (This feature facilitates the checking process when using both a probe type gage and flush & gap type gage on the same application.)

5.3.4 PORT 2A SUB-MENU

PORT 2A is used with a simultaneous flush & gap type gage (such as the LMI 241 - Flush reading).

READ >
LABEL >
CAL SPAN >

5.3.4A READ:

See Section 5.3.2A.

5.3.4B LABEL:

Use the right arrow key to access the LABEL sub-menu.. The operator can use F (default), X, Y, A, B, or G as the gage label for PORT 2A. Use the up or down arrow key to access options; press SELECT at the desired option..

5.3.4C CAL SPAN:

See Section 5.3.2C

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5.3.5 PORT 2B SUB-MENU

PORT 2B is used with a simultaneous flush & gap type gage (such as the LMI 241 - Gap reading).

READ >

LABEL >

CAL SPAN >

5.3.5A READ:

See Section 5.3.2A.

5.3.5B LABEL:

Use the right arrow key to access the LABEL sub-menu. The operator can use G (default), X, Y, A, B, or F as the gage label for PORT 2B. Use the up or down arrow key to access options; press SELECT at the desired option..

5.3.5D CAL SPAN:

See Section 5.3.2C.

5.3.6 F/G TGL SUB MENU

The operator can use the Flush & Gap Toggle option in PORT 1B. If F/G or G/F is selected as the gage label, this option allows the operator to take alternate flush and gap readings without using the SELECT key to toggle between master points.

Use the right arrow key to access the F/G TGL sub-menu; use the up or down arrow keys to access options; press SELECT at the desired option.

AUTO

MANUAL

5.3.7 UNITS SUB-MENU

The LMI 585 can transmit data in Metric (default) or English units of measure. Use the right arrow key to access the UNITS sub-menu; use the up or down arrow keys to access options; press SELECT at the desired option.

METRIC

ENGLISH

5.3.7A METRIC:

Press the SELECT key to choose the Metric unit of measure; the LMI 585 will prompt the user to choose 2 (default) or 3 decimal places. Use the up or down key to access the desired option and press SELECT.

5.3.7B ENGLISH:

Press the SELECT key to choose the English unit of measure; the LMI 585 will prompt the user to choose 3 (default) or 4 decimal places. Use the up or down key to access the desired option and press SELECT.

6 TRANSMIT DATA INTO TERMINAL

The LMI 585 can transmit ASCII characters to a Windows™ application on a PC or to a data collector. Below are step-by-step instructions for transmission.

6.1 Configuring a Terminal File for LMI 585 Digital Transmitter

1. Use the LMI 6019 Interface Cable to attach the LMI 585 to a free COM port on the PC or data collector. (Use the 8-pin RS-232 connector site on the LMI 585.)
2. Run “Terminal” from the Accessories group in the Program Manager.
3. Select “Settings” from the Terminal menu and choose “Communications”.
4. Enter the following settings:
 - Baud Rate: 4800
 - Data Bits: 8
 - Stop Bits: 1
 - Parity: None
 - Flow Control: None
 - Connector: Select the comport that is connected to the LMI 585
 - Parity Check: Do not check
 - Carrier Detect: Do not check
5. Click “OK” for the above settings.
6. Select “File” from the Terminal menu and choose “Save”.
7. Enter a filename and choose a directory to save the LMI 585 data into Terminal.
8. Click “OK” to save Terminal file settings.

6.2 EXPORT DATA FROM LMI 585 TO TERMINAL

The PC or data collector is now ready to receive data from the LMI 585. Steps 1 through 9 are initial set-up steps; once the file has been saved, the operator can transmit by opening the file and performing the following steps:

1. Press the SEND key on the LMI 585. Data will be displayed in the Terminal window.
2. Continue to press SEND until all data has been transmitted.
3. If the operator does not wish to transfer data to a text file, select “File” and “Exit”. The data will not be saved in the Terminal file, however, the file settings will be saved and can be used for future transmissions from the LMI 585.

6.3 TRANSFERRING DATA FILE TO TEXT FILE

1. In the Terminal file with data, select “Edit” and choose “Select All”.
2. Select “Edit” and choose “Copy”.
3. Multi-task file by minimizing the Terminal window. Refer to Windows™ documentation or “Help” for instructions on minimizing.
4. Select “Accessories” in Program Manager and choose “Notepad”. (The data from Terminal can be transferred to any Windows™ based application using the same steps.)
5. Select “Edit” in “Notepad” menu and choose “Paste”. Data will appear on screen.
6. Select “File” and choose “Save”.

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7. Select or type a file name and select the desired directory to save data. Click "OK".
8. Data has been saved in a text file. The file can be retrieved or printed at any time.

LMI 585 CALIBRATION

LMI 200 SERIES

1. Press <<Up Arrow>> to "Cal"
2. Press <<Right Arrow>> to "Port 1P"
3. Press <<Right Arrow>> to "Low Cal"
4. Place the transducer in the lowest step of the LMI 210 Master block. Press <<Select>>
5. Place the transducer in the tallest step the LMI 210 Master block. Press <<Select>>
6. Place the transducer in the middle step of the LMI 210 Master block. Press <<Select>>
7. Press <<Send>> to view readings
8. Press <<Left Arrow>> as necessary to display desired gage.

LMI 300/700 SERIES

1. Press <<Up Arrow>> to "Cal"
2. Press <<Right Arrow>> to "Port 1P"
3. Press <<Down Arrow>> to "Port 1F"
4. Press <<Right Arrow>> to "Low Cal"
5. Fully retract the Transducer. Press <<Select>>
6. Fully extend the Transducer. Press <<Select>>
7. Place the Transducer in the Flush Master Position. Press <<Select>>
8. Place the Transducer in the Gap Master Position. Press <<Select>>
9. To adjust the Gap Master to read actual gap, use arrow keys. Press <<Select>>
10. Press <<Send>> to view readings
11. Press <<Left Arrow>> as necessary to display desired gage.

LMI 241 SERIES

FOR FLUSH:

1. Press <<Up Arrow>> to "Cal"
2. Press <<Right Arrow>> to "Port 1P"
3. Press <<Down Arrow>> to "Port 2F"
4. Press <<Right Arrow>> to "Low Cal"
5. Fully retract the Flush Tip. Press <<Select>>
6. Fully extend the Flush Tip. Press <<Select>>
7. Place the Transducer in the Flush Master Position. Press <<Select>>

FOR GAP:

8. Press <<Down Arrow>> to "Port 2G"
9. Press <<Right Arrow>> to "Low Cal"
10. Fully retract the Gap Pin. Press <<Select>>
11. Fully extend the Gap Pin. Press <<Select>>
12. Place the Transducer in the Gap Master Position. Press <<Select>>
13. To adjust the Gap Master to read actual gap, use arrow keys. Press <<Select>>
14. Press <<Send>> to view readings.
15. Press <<Left Arrow>> as necessary to display desired gage.

Note:

- * This calibration procedure produces a positive reading when the gages are extended beyond the nominal position.
- ** To reverse the sign, for the LMI 200 Series reverse Steps 4 and 5.
- *** To reverse the sign, for the LMI 300/700 Series, reverse Steps 5 and 6. All other steps remain the same. To reverse the sign on the flush (f) or gap reading (g), go to the advanced functions submenu 1b. Press the Right arrow once to read and Down arrow once to label. Press the Right arrow twice to sign. Use Up/Down arrow key to toggle. Press <<select>> to change.

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**** To reverse the sign, for the LMI 241, reverse steps 5 and 6, 10 and 11.

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