Manual Addendum for the 9105-IF-OEMx DAQ Transducer Systems

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Engineered Products for Robotic Productivity

Pinnacle Park • 1031 Goodworth Drive • Apex, NC 27539 • Tel:+1 919.772.0115 • Fax:+1 919.772.8259 • *www.ati-ia.com*

Foreword

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ATI OEM F/T Interface Boards are intended to be designed and installed into an EMC-safe enclosure before use. For recommendations on how to design EMC safe enclosures, please consult the Institute of Electrical and Electronics Engineers (IEEE) at *www.ieee.org*.

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> Note
>
> Please read the manual before calling customer service, and have the following information available:
>
> 1. Serial number (e.g., FT01234)
> 2. Transducer model (e.g., Axia, etc.)
> 3. Calibration (e.g., US-15-50, SI-65-6, etc.)
> 4. Accurate and complete description of the concern or question
> 5. Computer and software information, for example: operating system, PC type, drivers, and application software
>
> Be near the F/T system when calling (if possible).

Please contact an ATI representative for assistance, if needed:

Sale, Service and Information about ATI products:

ATI Industrial Automation
1031 Goodworth Drive
Apex, NC 27539 USA
www.ati-ia.com
Tel: +1.919.772.0115
Fax: +1.919.772.8259

Application Engineering
Tel: +1.919.772.0115, Extension 511
Fax: +1.919.772.8259
E-mail: *ft_support@ati-ia.com*

Table of Contents

1. Safety

The safety section describes general safety guidelines to be followed with this product, explanations of the notifications found in this manual, and safety precautions that apply to the product. Product specific notifications are imbedded within the sections of this manual (where they apply).

1.1 Explanation of Notifications

These notifications are used in all of ATI manuals and are not specific to this product. The user should heed all notifications from the robot manufacturer and/or the manufacturers of other components used in the installation.

DANGER: Notification of information or instructions that if not followed will result in death or serious injury. The notification provides information about the nature of the hazardous situation, the consequences of not avoiding the hazard, and the method for avoiding the situation.

WARNING: Notification of information or instructions that if not followed could result in death or serious injury. The notification provides information about the nature of the hazardous situation, the consequences of not avoiding the hazard, and the method for avoiding the situation.

CAUTION: Notification of information or instructions that if not followed could result in moderate injury or will cause damage to equipment. The notification provides information about the nature of the hazardous situation, the consequences of not avoiding the hazard, and the method for avoiding the situation.

NOTICE: Notification of specific information or instructions about maintaining, operating, installing, or setting up the product that if not followed could result in damage to equipment. The notification can emphasize, but is not limited to: specific grease types, best operating practices, and maintenance tips.

1.2 General Safety Guidelines

The customer should verify that the sensor is rated for maximum loads and torques expected during operation. Because static forces are less than the dynamic forces from the acceleration or declaration of the robot, be aware of the dynamic loads caused by the robot.

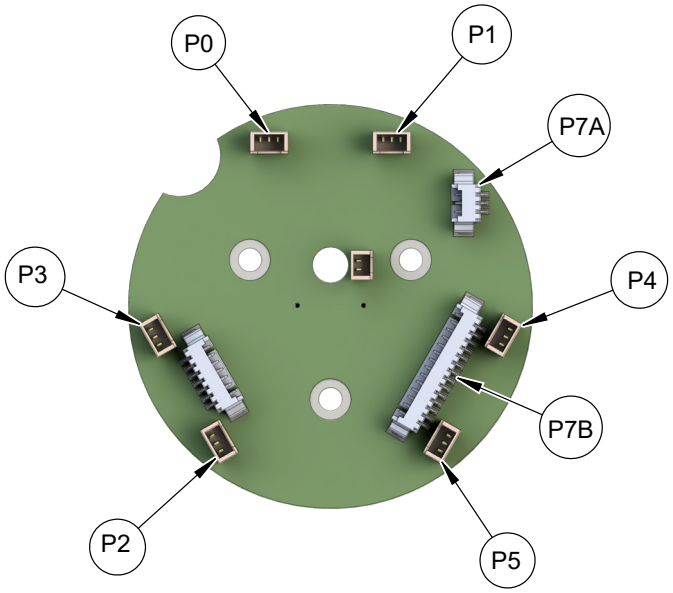
2. Overview

The IF-OEMx boards are external interface boards that are used with TW transducers. TW transducers do not have integrated electronics for conditioning the transducer signal. The IF-OEMx transducer systems receive direct power via a cable (ATI P/N 9105-C-MX-U-XX) connected to the P7A connector on the IF-OEMx board. The six gage outputs are amplified on the IF-OEMx board. On this board, the P7B connector passes these outputs to the DAQ device through the cable (ATI P/N 9105-C-MX-U-XX). Then these gage outputs are processed through the UserAcess calibration matrix and become usable F/T measurements (refer to *Section 3—Converting Gages to F/T Measurements*). For more information about standard DAQ transducer systems and the operational characteristics of IF-OEMx transducer systems, refer to the *9620-05-DAQ* manual.

2.1 Installing an IF-OEM Board to a TW Transducer

The -MX connector configuration on the sensor cable has six 3-pin Molex connectors. Each cable connector is labeled P0 through P5 and corresponds to the six gage outputs from the sensor to the board. The IF-OEMx board has six 3-pin Molex connectors that are labeled P0 through P5. Attach each cable connector to the corresponding connector on the board. The following figure shows the connectors on a IF-OEMx board.

Figure 2.1—IF-OEMx Board



Pinout and specification information for the P7A and P7B connectors on 9105-IF-OEMx boards and for the DB26 connector on the 9105-IF-OEM2 board are in the following sections.

2.2 P7A Connector for Power Input: Pinout and Electrical Specifications

To power the IF-OEMx board, supply ± 15 V to P7A connector.

Table 2.1—P7A Power Input Pinout

Pin Number	Color	Signal
1	Red	+ 15 VDC
2	Black	Ground
3	Orange	- 15 VDC

Electrical specification for the +/-15VDC P7A connector are in the following table:

Table 2.2—IF-OEM ± 15 V Electrical Specifications				
Signal	**Minimum**	**Typical**	**Maximum**	**Units**
+ V_{ANA} Power Input Voltage	13.0	15.0	17.0	V DC
- V_{ANA} Power Input Voltage	-17.0	-15.0	-13.0	V DC
+V_{ANA} Power Input Current	N/A		50.0	mA
-V_{ANA} Power Input Current			-45.0	mA
V_{ANA} Power Input Noise			75.0	mV p-p
V_{ANA} Power Input Regulation			0.5%	N/A

NOTICE: Custom cables that mate to the P7A and P7B headers use Molex microminature 1.25 mm receptacles.

2.3 P7B Connector for Signal Output

P7B is the output for the six amplified signals that connect to the DAQ device. The signal output is in the following table:

NOTICE: The T REF and T OUT signal is used only on custom sensors with a thermistor installed. Standard sensors do not have a thermistor; do not connect these signals to the DAQ device.

Table 2.3—P7B Signal Output			
Pin Number	**Color**	**Signal Name**	**Note**
1	Brown/White	G0 REF	}Twisted Pair
2	Brown	G0 OUT	
3	Yellow/White	G1 REF	}Twisted Pair
4	Yellow	G1 OUT	
5	Green/White	G2 REF	}Twisted Pair
6	Green	G2 OUT	
7	Blue/White	G3 REF	}Twisted Pair
8	Blue	G3 OUT	
9	Violet/White	G4 REF	}Twisted Pair
10	Violet	G4 OUT	
11	Grey/White	G5 REF	}Twisted Pair
12	Grey	G5 OUT	
13	White/Black	T REF	}Twisted Pair
14	White	T OUT	

2.4 DB26 (9105-IF-OEM2) Connector Pinout

The DB26 connector pinout for the 9105-IF-OEM2 is in the following table:

Table 2.4—DB26 Connector Pinout

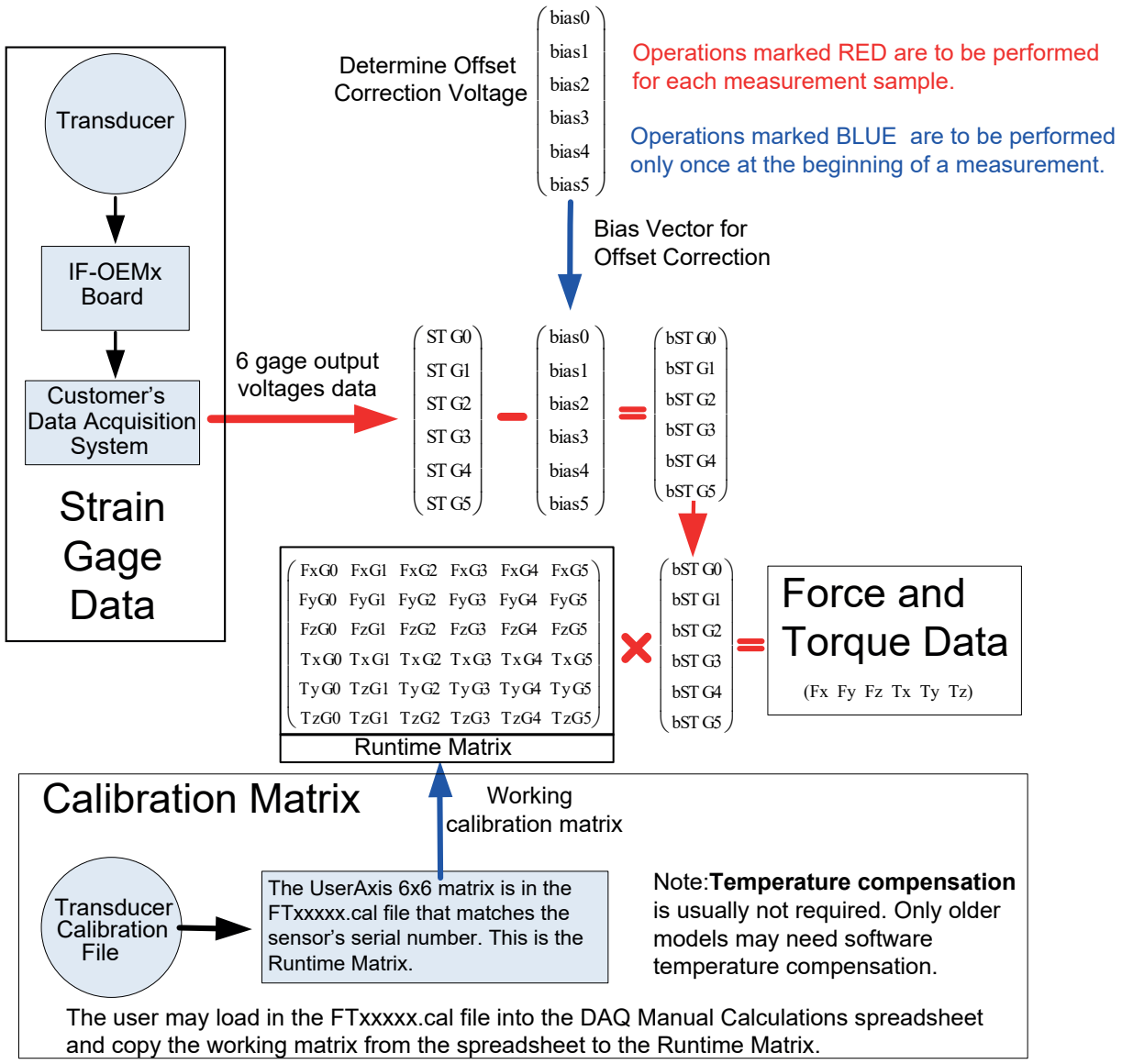
Pin Number	Signal Name
1	Ch7 OUT
2	+5 V
3	T OUT
4	Gage5 OUT
5	Gage4 OUT
6	Gage3 OUT
7	Gage2 OUT
8	Gage1 OUT
9	Gage0 OUT
11	DGND (ground)
12	THERMISTOR REF
13	Gage5 OUT
14	Gage4 OUT
15	Gage3 OUT
16	Gage2 OUT
17	Gage1 OUT
18	Gage0 OUT
19	DIO0
21	+15 VDC Input
22	AGND Input
23	-15 VDC Input

3. Converting Gages to F/T Measurements

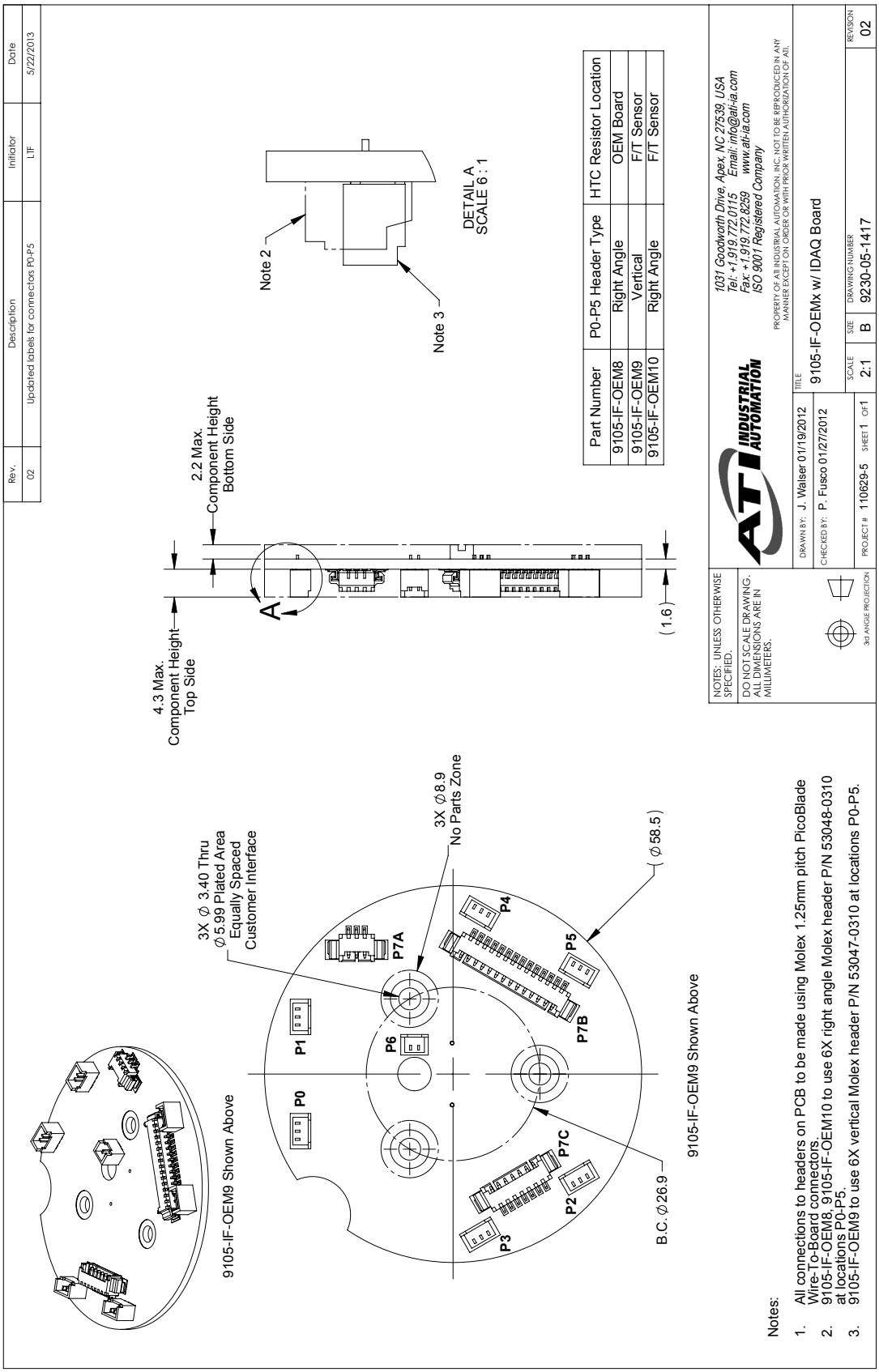
After the IF-OEMx DAQ Transducer system is connected and powered, a UserAxis calibration matrix converts the six amplified gage voltages (G0 through G5 to the DAQ device) into Force and Torque measurements. The UserAxis 6x6 matrix can be found in the FTxxxxx.cal file, which can be downloaded from the ATI website: *https://www2.ati-ia.com/Library/Software/FTDigitaldownload/getcalfiles.aspx*. The Runtime Matrix is shown in the following figure.

NOTICE: If the DAQ device is a National Instruments® product, use the ATI DAQ Demo program to complete the following conversion.

Figure 3.1—Runtime Matrix



4. Drawing


Rev.
Description
Initiator
Date
02
Updated labels for connectors P0-P5
LTF
5/22/2013
Part Number
P0-P5 Header Type
HTC Resistor Location
9105-IF-OEM8
Right Angle
OEM Board
9105-IF-OEM9
Vertical
F/T Sensor
9105-IF-OEM10
Right Angle
F/T Sensor
Note 2
Note 3
DETAIL A
SCALE 6 : 1
2.2 Max.
Component Height
Bottom Side
4.3 Max.
Component Height
Top Side
(1.6)
3X ∅ 3.40 Thru
∅ 5.99 Plated Area
Equally Spaced
Customer Interface
3X ∅8.9
No Parts Zone
(∅58.5)
B.C.∅26.9
P0
P1
P2
P3
P4
P5
P6
P7A
P7B
P7C
9105-IF-OEM9 Shown Above
9105-IF-OEM9 Shown Above
NOTES: UNLESS OTHERWISE SPECIFIED.
DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS.
DRAWN BY: J. Walser 01/19/2012
CHECKED BY: P. Fusco 01/27/2012
PROJECT # 110629-5
SHEET 1 OF 1
TITLE
9105-IF-OEMx w/ IDAQ Board
SCALE 2:1
SIZE B
DRAWING NUMBER 9230-05-1417
REVISION 02
3rd ANGLE PROJECTION
1031 Goodworth Drive, Apex, NC 27539, USA
Tel: +1.919.772.0115 Email: info@ati-ia.com
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Notes:
1. All connections to headers on PCB to be made using Molex 1.25mm pitch PicoBlade Wire-To-Board connectors.
2. 9105-IF-OEM8, 9105-IF-OEM10 to use 6X right angle Molex header P/N 53048-0310 at locations P0-P5.
3. 9105-IF-OEM9 to use 6X vertical Molex header P/N 53047-0310 at locations P0-P5.

5. Terms and Conditions of Sale

The following Terms and Conditions are a supplement to and include a portion of ATI's Standard Terms and Conditions, which are on file at ATI and available upon request.

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