Micro-Tech™ 9105/9205 Feeder Controller User Manual

REC 4299 Rev E

Part Number 127427—English

Thermo SCIENTIFIC

Revision History

Revision Number	Date Released	Eco Number	Details of the Release
Rev A	May 2013	3322	First release of the newly created *Micro-Tech 9105/ 9205 Feeder Controller User Manual.*
Rev B	September 2013	3363	Corrections.
Rev C	November 2013	3403	Corrections.
Rev D	July 2014	3488	New software version 141.00.01.10. Added notes requiring use of certified bushings for openings.
Rev E	October 2014	3765	Corrections.

Software Version: 141.00.01.10

For future reference, write your belt-scale code below.

Micro-Tech belt-scale code = _____

Occupational Safety and Health Act (OSHA)

The Occupational Safety and Health Act clearly places the burden of compliance on the user of the equipment and the act is generalized to the extent that determination of compliance is a judgment decision on the part of the local inspection. Hence, Thermo Fisher Scientific will not be responsible for meeting the full requirements of OSHA in respect to the equipment supplied or for any penalty assessed for failure to meet the requirements, in respect to the equipment supplied, as interpreted by an authorized inspector. Thermo Fisher Scientific will use their best efforts to remedy such violation at a reasonable cost to the buyer.

Safety in Transportation and Handling

The Micro-Tech is an integral part of your plant and when transporting, handling, and installing the unit, your own plant safety instructions must be applied. Because your Micro-Tech and associated systems are tailored to application requirements, it is impossible to be precise about product mass/weight. If precise values are required, the shipping crate will be marked with the overall shipping mass of the product and this may be used as a reasonable guideline.

Safe Practices During Use, Maintenance, and Repair

This manual contains details, as appropriate, including the appropriate tools. However, because of its importance, the warning contained in the installation section is repeated here.

TO GUARANTEE PERSONAL SAFETY, CARE MUST BE TAKEN WHEN WORKING ON OR AROUND THE MICRO-TECH. AS WITH ALL SUCH DEVICES THE MAIN SUPPLIES (ELECTRICAL AND OTHER) TO THE SYSTEM MUST BE LOCKED OFF WHEN PERFORMING REPAIR OR MAINTENANCE WORK.

Low Voltage Directives

All of the recommendations for LVD apply to the prevention of electrical shock. If access to the electronics enclosure is required, the incoming AC power supply should be isolated remotely and locked-off. Access to the electronics enclosure by untrained personnel is not recommended.

Circuit Breaker

The Micro-Tech should be permanently connected to its AC supply. Please ensure that when installing the Micro-Tech, a switch or circuit breaker is used and is positioned close to the Micro-Tech in easy reach of the operator. The switch or circuit breaker shall be marked as the disconnecting device for the Micro-Tech.

DO NOT install the Micro-Tech in a position that makes it hard to use the AC mains isolator.

Thermo Fisher Scientific Warranty

The seller agrees, represents, and warrants that the equipment delivered hereunder shall be free from defects in material and workmanship. Such warranty shall not apply to accessories, parts, or material purchased by the seller unless they are manufactured pursuant to seller's design, but shall apply to the workmanship incorporated in the installation of such items in the complete equipment. To the extent, purchased parts or accessories are covered by the manufacturer's warranty; seller shall extend such warranty to buyer.

Seller's obligation under said warranty is conditioned upon the return of the defective equipment, transportation charges prepaid, to the seller's factory in Minneapolis, Minnesota, and the submission of reasonable proof to seller prior to return of the equipment that the defect is due to a matter embraced within seller's warranty hereunder. Any such defect in material and workmanship shall be presented to seller as soon as such alleged errors or defects are discovered by purchaser and seller is given opportunity to investigate and correct alleged errors or defects and in all cases, buyer must have notified seller thereof within one (1) year after delivery, or one (1) year after installation if the installation was accomplished by the seller.

Said warranty shall not apply if the equipment shall not have been operated and maintained in accordance with seller's written instructions applicable to such equipment, or if such equipment shall have been repaired or altered or modified without seller's approval; provided, however, that the foregoing limitation of warranty insofar as it relates to repairs, alterations, or modifications, shall not be applicable to routine preventive and corrective maintenance which normally occur in the operation of the equipment.

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Purchaser agrees to underwrite the cost of any labor required for replacement; including time, travel, and living expenses of a Thermo Fisher Scientific Field Service Engineer at the closest factory base.

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About This Manual

This manual tells you how to install, operate, and troubleshoot the Micro-Tech. If you encounter a technical term or unit of measure that you do not recognize in the manual or in the Micro-Tech screens themselves, please consult the glossary at the end of the manual.

Conventions

The following conventions are used in this manual.

- The names of Micro-Tech buttons, functions, and so on are shown using initial upper-case letters—for example, Menu, Run, Edit, Choice, Tph (standard U.S. tons per hour), and so forth.

- *Italics* are used in the text for emphasis.

NOTE. Provides information of special importance. ▲

HINT. Indicates a hint about understanding or operating the Micro-Tech. ▲

Safety Precautions

Listed below are the safety messages for your Micro-Tech and its associated scale system. Please read all safety messages *very carefully*, because this information is important—for your own personal safety and the safety of others.

WARNING. Failure to observe could result in death or serious injury. ▲

CAUTION. Failure to observe may cause minor injury or damage to the equipment. ▲

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Chapter 1
Introduction

This manual provides the information you need to install, operate, and troubleshoot the Micro-Tech. Please read the entire manual before working with your Micro-Tech. For personal and system safety, and for the best product performance, make sure you thoroughly understand the manual before installing or using your Micro-Tech.

Unpacking the Micro-Tech

The Micro-Tech has been properly packaged for shipment at the factory. Please inspect all packages for damage *before* opening the shipping package, because the carrier is likely responsible for any damage. Once removed from the package, the Micro-Tech can be safely stored with its cover and latches secured and with the hole plugs installed. During storage, do not expose the Micro-Tech to moisture or to temperatures outside the range of –22 to +158°F (–30° to +70°C).

Overview of the Micro-Tech

The Micro-Tech 9000 Field Mount Integrator (Figure 1-1) or Panel Mount Integrator (Figure 1-2) is a bus-based microcomputer driven instrument.

By suitable processing of input signals, the Integrator delivers visible and electrical output representing the rate of material movement, or other factors specific to the model.

The Micro-Tech has provisions for four outputs on the digital output board, plus one DC output from the mother board—making a total of five, one of which can be defined as a Fault output. In addition, many automatic and check functions are available to monitor its calibration functions and maintenance schedule.

There are two models of Micro-Tech: the field-mounted version (figure 1–1) and the panel-mounted version (figure 1–2). For the panel-mounted version, provide a cut-out (see figure 1–2 for dimensions) in the panel and, after removing the holding brackets and installing the gasket, insert the Micro-Tech.

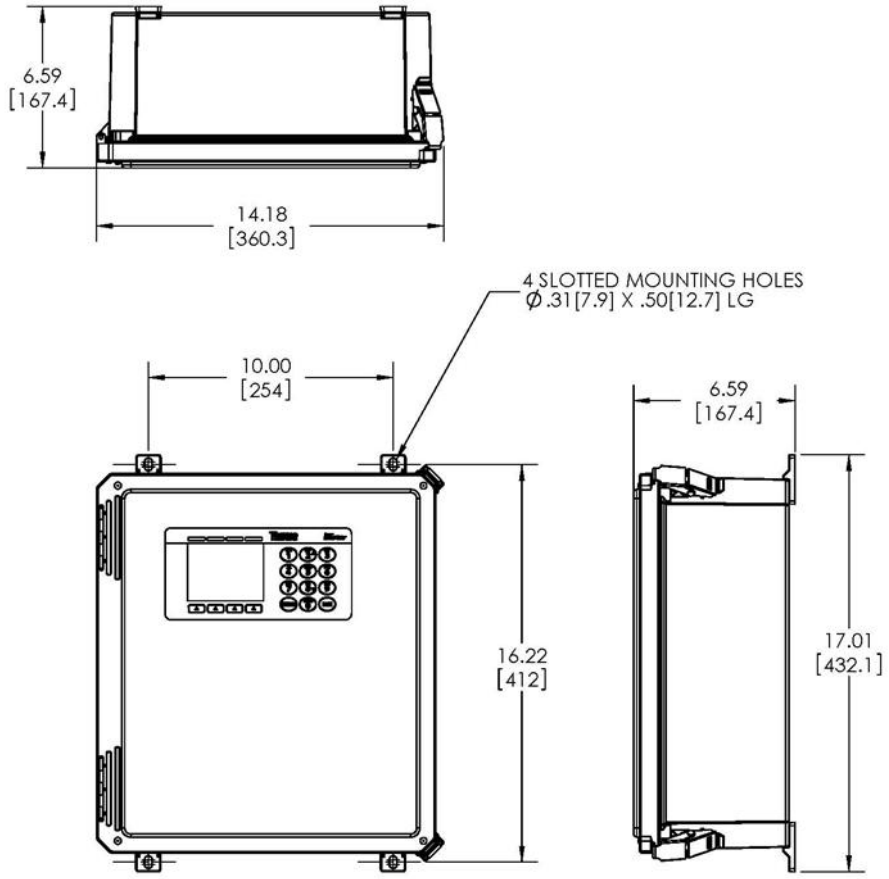


Figure 1–1. Field-Mounted Version of the Micro-Tech

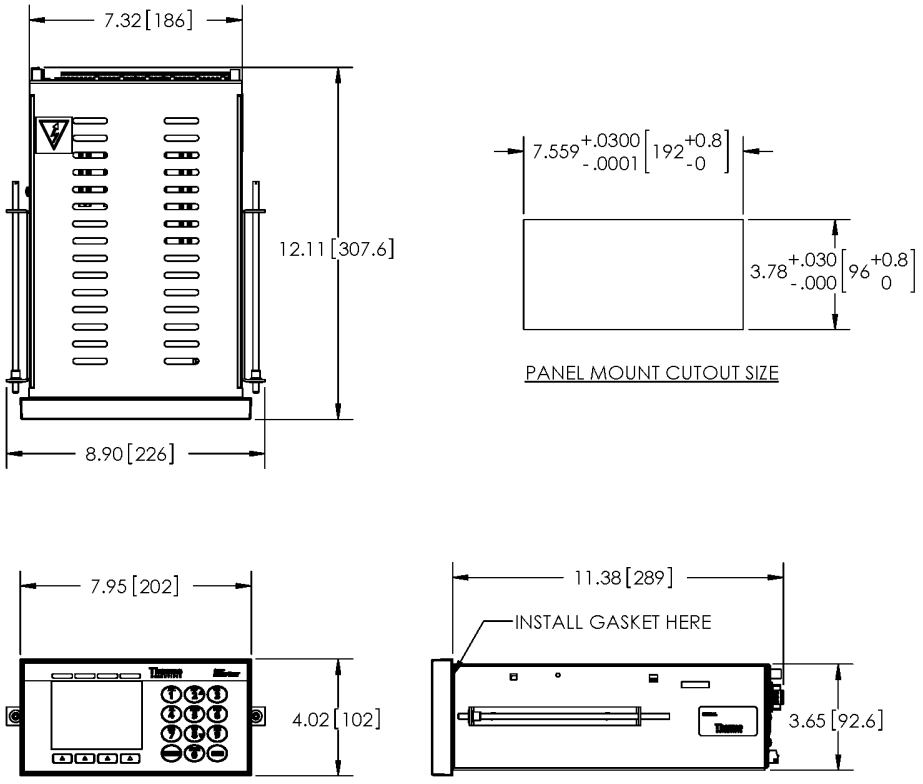


Figure 1–2. Panel-Mounted Version of the Micro-Tech

Important Safety Information

Please read the following warnings and cautions before installing, operating, or maintaining the Micro-Tech.

General Safety Precautions

CAUTION. Do not install, operate, or perform any maintenance procedures until you have read all the safety precautions listed below. ▲

CAUTION. Do not connect power to the electronics or turn on the unit until you have read and understood this entire manual. The precautions and procedures presented in this manual must be followed carefully in order to prevent equipment damage and protect the operator from possible injury. ▲

CAUTION. For North America locations a certified Nema 4/4X bushing must be used for openings. For other locations see your local Electrical Authorities. ▲

WARNING. Covers over the electronics should always remain in place during operation. They should be removed only for maintenance procedures with the machine's power OFF. Be sure to replace all covers before resuming operation. ▲

WARNING. All switches (such as control or power) must be OFF when checking input AC electrical connections, removing or inserting printed circuit boards, or attaching voltmeters to the system. ▲

WARNING. Incoming voltages must be checked with a voltmeter before being connected to the electronics. ▲

WARNING. Extreme caution must be used in testing in, on, or around the electronics, PC boards, or modules. There are voltages in excess of 115V or 230V in these areas. Avoid high voltage and static electricity around the printed circuit boards. ▲

WARNING. Maintenance procedures should be performed only by qualified service personnel and in accordance with procedures/instructions given in this manual. ▲

WARNING. During maintenance, a safety tag (not supplied by Thermo Fisher Scientific) should be displayed in the ON/OFF switch areas as a precaution instructing others not to operate the unit. ▲

WARNING. Only qualified service technicians should be allowed to open and work in the electronics, power supply, control, or switch boxes. ▲

WARNING. This equipment should not be operated or utilized in applications other than those stated in the original order. ▲

WARNING. All panels covering the electronics must be in place and tight before wash down procedures. Damage to the electronics could result from water, moisture, or contamination in the electronics housing. ▲

Incoming Power Safety

Please read the following warnings and cautions, when working with incoming power to the Micro-Tech or its associated systems.

CAUTION. Do not connect power until you have read and understood this entire section. Improper connection may result in damage to your Micro-Tech. ▲

WARNING. All wiring must be in accordance with standards (IEC, EN) national and local codes (NEC, VDE, and so forth) outline provisions, for safely installing electrical equipment. Installation must comply with specifications regarding wire types, conductor sizes, branch circuit protection, and disconnect devices. Failure to do so may result in personal injury and/or equipment damage. ▲

WARNING. Ground impedance must conform to the requirements of national and local industrial safety regulations and/or electrical codes. The integrity of all ground connections should be periodically checked. For installations within a cabinet, a single safety ground-point or ground bus-bar connected directly to building steel should be used. All circuits including the AC input ground conductor should be grounded independently and directly to this point/bar. Grounding all enclosures and conduits is strongly recommended. ▲

CAUTION. Verify that the input voltage is correct with an AC voltmeter before you connect it to the Micro-Tech. ▲

CAUTION. Earth ground must be provided to the Micro-Tech. Do not use conduit to provide this ground. ▲

CAUTION. A readily accessible disconnect device (maximum 20 amp) must be incorporated in the field wiring. This disconnect device should be within easy reach of the operator and must be marked as the disconnecting device for the equipment. ▲

EMC Instructions

The Micro-Tech may cause radio interference if used in a residential or domestic environment. The installer is required to take measures to prevent interference, in addition to the essential requirements for CE compliance provided in this manual, if necessary.

Conformity of the Micro-Tech with CE/EMC requirements does not guarantee an entire machine or installation complies with CE/EMC requirements.

Hardware Installation

This section tells you how to complete the hardware installation for your Micro-Tech. Please go to the appropriate section, depending on which model of Micro-Tech you purchased (field-mounted or panel-mounted).

Important Wiring and Safety Information

Before installing the Micro-Tech, please read the following important safety information about wiring up the Micro-Tech.

- Ensure power is OFF at the main disconnect.
- Do not route load-cell and signal cables in the same conduit with power cables or any large source of electrical noise.
- Earth ground all instrument chassis' and conduits. A ground connection between all conduits is required.
- Connect the shields *only* where shown.
- Check that all wires are tight in their connections.
- Never use a "megger" to check the wiring.
- A readily accessible disconnect device must be incorporated in the field wiring. This disconnect should be within easy reach of the operator and must be marked as the disconnecting device for the Micro-Tech and associated equipment.
- All conduits should enter the bottom of the enclosure. Do not run conduit through the top or sides of the enclosure.

Installing the Field Model

The integrator should not be exposed to excessive vibration, heat, direct sunlight, or moisture. The ideal mounting location would be on a separate wall or beam in view of the device being monitored. Refer to system wiring diagram for the maximum allowed distance from the monitored device to the Micro-Tech.

Mounting

Mount the Micro-Tech to a rigid, flat, vertical surface using four mounting holes provided on the back of the enclosure. Care should be taken to ensure the mounting surface is flat, so as not to twist or warp the fiberglass enclosure when tightening the mounting bolts.

Connecting the Incoming Power Supply

To connect the incoming power, use the following procedure. Please note that all units shipped from the factory are configured for 100 to 240 VAC.

1. A customer-supplied 2 amp 250 VAC normal-blow fuse must be connected in the “hot” power lead between the AC Mains and the Micro-Tech “AC Power Input” terminal block.

2. Unlatch and open the enclosure door.

3. Route incoming power wiring through a conduit hole at the bottom right of the enclosure. For North America locations a certified Nema 4/4X bushing must be used for openings. For other locations see your local Electrical Authorities. Leave ample loose wiring (typically 8 inches / 20 cm) to facilitate removing the terminal connectors.

4. Locate the wiring panel (see figure 1-4 below), which lies on the underside of the electronics enclosure. The wire-safety ground-terminal is located on the enclosure back panel.

5. Wire HOT to Terminal H on the AC PWR IN terminal.

6. Wire NEUTRAL to Terminal N on the AC PWR IN terminal.

7. If additional I/O is required at the line voltages, these wires should be routed through a conduit hole on the bottom right of the enclosure. Leave ample loose wiring (typically 8 inches / 20 cm) to facilitate removing the terminal connectors.

8. In the case of sourcing power for the AC outputs/inputs from the integrator, source the power from the AUX PWR OUT terminal.

9. All additional field wiring operation at voltages less than 30 V must be located on the left bottom of the enclosure. Leave ample loose wiring (typically 8 inches / 20 cm) to facilitate removing the terminal connectors.

10. Close and latch the enclosure door.

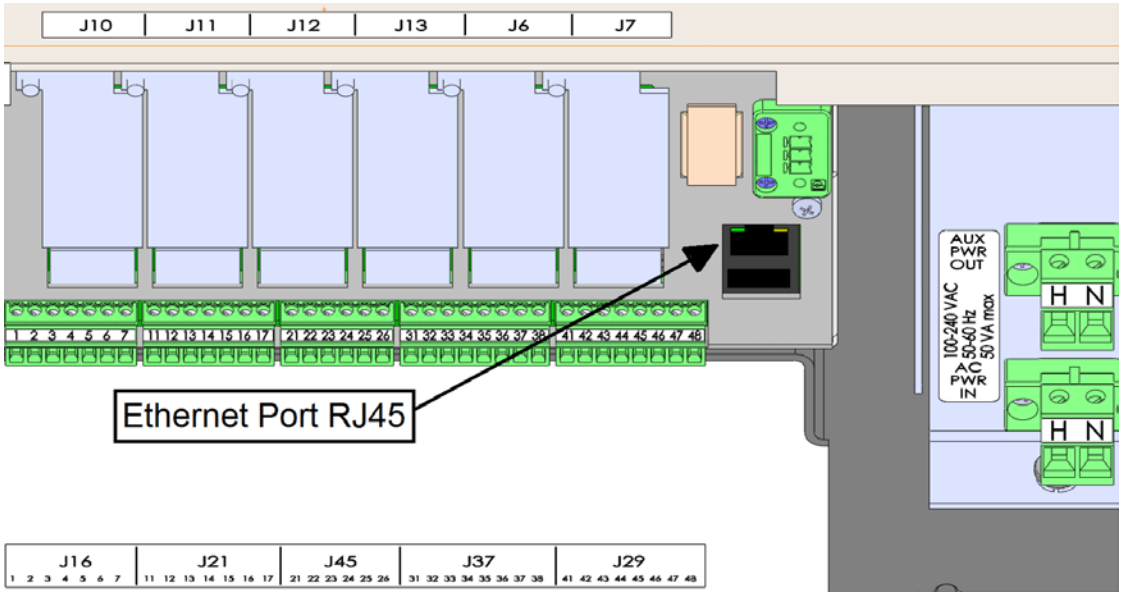


Figure 1–3. Connectors on Underside of Enclosure

Installing the Panel Model

This model of the Micro-Tech is designed to be mounted in an instrument panel. The instrument panel should not be exposed to excessive vibration, heat, or moisture. The front bezel, when properly seated, forms a dust seal. A two-inch clearance around the top and bottom of the Micro-Tech is required for convection cooling. Additional clearances may be required if other equipment mounted directly below the Micro-Tech generates excessive heat. A 2-3 inch (50-75mm) clearance in the back is necessary for wiring access and fuse replacement. A 1 inch (25mm) clearance on each side is necessary for inserting the chassis-holding brackets from the back after inserting the Micro-Tech.

Mounting

Provide a cut-out (see figure 1-2 for dimensions) in the panel and, after removing the holding brackets, and installing the gasket, insert the Micro-Tech. From the back, insert the holding brackets on both sides of the Micro-Tech. Tighten the holding brackets to support the Micro-Tech and form a dust seal.

Connecting the Incoming Power Supply

To connect the incoming power to the Micro-Tech, use the following procedure. Please note that all units are 24VDC *only*.

1. For input power, use 16 AWG / 1.5 mmsq standard wires.
2. Wire the safety ground to the terminal labeled “E” on the Power Input Terminal.
3. Wire the +24VDC to the terminal labeled “+” on the Power Input Terminal.
4. Wire the 24VDC Common to the terminal labeled “–” on the Power Input Terminal.

Configuring Jumpers and Switches

In most instances, your Micro-Tech is shipped to you from the factory with all the needed jumpers installed and the switches set in the correct positions for your particular installation and application. As a result, you should not need to connect any jumpers or set any switches but, if you do, all the appropriate settings are shown in the specific model reference manual.

Micro-Tech Features

The following sections give you a quick overview of the Micro-Tech’s features, functions, and capabilities.

Standard Features

The Micro-Tech has many hardware and software features. The standard features of the Micro-Tech are listed below.

- Menu-driven scroll entries on a four line display.
- Four LED status indicators.
- Audit trail.
- Automatic zero and span calibration.
- Auto zero tracking (where applicable)
- Several software options that may be turned on by keypad entry or by installing optional plug-in PC boards.
- Optically coupled digital inputs and outputs.
- Alarms and failure detection.

- Communication standards such as RS232C, RS485, and networking multi-drop.
- Allen-Bradley DF1 and Modbus RTU.
- Ethernet/IP and Modbus/TCP

Inputs and Outputs

The standard Micro-Tech configuration is as follows. For more information about the Micro-Tech's communication protocols, see the specific model reference manual.

- USB port.
- Two serial communication ports.
- Two digital inputs on motherboard.
- One DC output from the mother board (J29).
- Ethernet TCP/IP.
- Four circuit board expansion slots that can accommodate the following boards, if needed.
  - Three programmable digital inputs on plug-in card.
  - Four programmable digital outputs on a plug-in card.
  - Single channel current output board
  - Dual channel current output, analog input board (2 analog in and 2 analog out)
  - 8 digital inputs/8 digital outputs board
  - Serial communication board
  - Profibus-DP board

Micro-Tech Menus and Functions

Each Micro-Tech has been designed for a specific application and is capable of performing all of the necessary measuring functions. All of the required functions are resident in the software of the microprocessor. Optional functions are automatically turned on when the relevant hardware is installed, or after the operator has selected them through the keypad. Setup of the Micro-Tech is easy and is performed from the keypad on the front of the device. The setup parameters may be divided into the following main groups.

- Menu 1: Calibration
- Menu 2: Set-up
- Menus 3–6: Options set-up

Monitoring Functions

The Integrator includes internal diagnostics that generate alarms in case of hardware failures or programming errors.

Alarms are visible on the display and can be acknowledged and reset through keypad, digital input, or serial line. Alarms can be delayed to avoid intervention in case of short time peaks. Each individual alarm can be programmed to operate as alarm, shut down, or ignored. Two LEDs indicate the cumulative status of alarms and shut down. Digital outputs are also provided for the following:

- Hardware failure
- Alarm cumulative
- Shut down cumulative

Print Functions

Timed or command prints can be obtained by connecting a serial printer to the Comm output on the motherboard, or an optional communication board. Data may also be downloaded to a USB memory device. Time and date are permanently stored in the battery-backed memory. The integrator Set-Up, Totals, Zero results, and Audit Trail of the instrument can be printed.

Communication Functions

There are two communication ports on the Motherboard. Comm A is RS232C/RS-485 (jumper selectable), isolated. Comm B is RS-485 only, non-isolated. One additional communication board may be installed. For detailed descriptions of communication protocols, see the specific model reference manual.

There are three types of standard communication functions, as described below.

- Serial Communications
  The communication protocol allows a remote intelligent device to read the contents of the registers and write to some registers. During the communication activity, the Micro-Tech always acts as a Slave, meaning it responds to a request from a Master device on the line, but never attempts to send messages out. One electrical interface may be selected and accessed through one communication port.

- Field Bus I/O
  Profibus-DP I/O communication protocol board is typically used to transfer I/O images between a main PLC and the remote devices

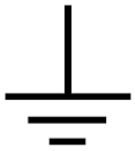
(normally remote I/O racks—rack adapters) or to transfer (read and write blocks of data with intelligent remote devices (node adapters), the Micro-Tech in this case. The Remote I/O is a typical master/slave communication where the main PLC is the master or scanner and the remote devices are slaves or adapters.

- Ethernet Port
  The Micro-Tech has a built-in Ethernet port. Communications protocols Ethernet/IP and Modbus/TCP can be used. The Micro-Tech is a slave device only, and cannot initiate messages.

Symbol Identification

Here are the details of the symbols used on the Micro-Tech.

Table 1–1. Symbol Identification

Symbol	Description
	Alternating current
	Earth (ground) TERMINAL
	PROTECTIVE CONDUCTOR TERMINAL
	Caution, risk of electric shock
	Caution (refer to accompanying documents)

Standards Applied

Conformity with the Low Voltage (LVD) Directive and Electromagnetic Compatibility (EMC) Directive has been demonstrated using harmonized European Norm (EN) standards published in the Official Journal of the European Communities, and International (IEC) applicable standard used in North America.

The Micro-Tech™ 9000 series comply with the EN and IEC standards listed below, when properly installed in accordance with this and other relevant manuals.

- CAN/CSA-C22.2 No.61010.1-04
  Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use.
  Part 1: General Requirements.

- UL 6101-1(2nd Edition)
  Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use.
  Part 1: General Requirements.

- UL 60950-1
  Information Technology Equipment—Safety
  Part 1: General Requirements.

- IEC/EN 61010-1:2001
  Safety requirements for electrical equipment for Measurement, Control, and laboratory use.
  Part 1: General requirements.

The Micro-Tech™ 9000 series has been tested with the EN and IEC standards listed below.

- IEC/EN 61326-1
  Electrical equipment for measurement, control and laboratory use—EMC requirements.
  Part 1: General requirements

- EN 55011
  Limits and methods of measurement of radio disturbance

characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.

- EN 55022
  Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement.

The Micro-Tech™ 9000 series complies with the following EN directives.

- 2006/95/CE—Low Voltage Directive.
- 2004/108/CE—EMC Directive.

Specifications

Here is a table showing the relevant technical specifications for the Micro-Tech.

Table 1–2. Micro-Tech Technical Specifications

Description	Specification
Field Mount Enclosure	NEMA 4X, IP66, dust and watertight, 17.01 [432] x 14.18 [360] x 6.59 [167] inches, fiberglass reinforced polyester. Steel chassis providing EMI/RFI shielding.
Panel Mount Enclosure	Size: 12.11 [308] x 4 [102] x 7.95 [202] inches. Material: Zinc-plated mild steel.
Environmental Conditions Mounting	Should be mounted as close to the measuring device as possible without being exposed to excessive heat or moisture. Field Mount suitable for outdoor mounting.
Temperature (Ambient)	Storage: -22° to +158° F (-30° to +70° C). Operating: –4° to +140° F (-20° to +60° C).
Relative Humidity	Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% humidity at 40°C.
Pollution Degree	Level 2 per IEC 61010-1
Altitude	Up to 6,561 ft (2000m)
Installation Category	2
Shock	15G peak for 11ms duration (±1.0 ms)
Vibration	0.006 in./0.152 mm displacement, 1G peak
Emission Limitation	According to IEC/EN 61326-1, Class A
Noise Immunity	According to IEC/EN 61326-1, Industrial Environmental
Nominal Voltage	Field Mount: 100 - 240 VAC. Panel Mount: 24VDC +10%,-15% (user supplied).
Nominal Frequency	Field Mount: 50-60 Hz. Panel Mount: DC only.
Fusing	250VAC, 2A fast acting, on motherboard
Power Consumption	50 VA max.
Maximum Non-Destructive Input Voltage	Field Mount: 265 VAC. Panel Mount: 28VDC.
DC Power Supply Required for Panel Mount	Output voltage: 24 VDC. Isolation: No. Output current: 2A minimum, short circuit protected.

Description	Specification
Processor	Coldfire MCF5234 32-bit microprocessor 2 MB Flash memory 128K NVRam 2 Integrated UARTs and Ethernet communication peripherals.
Removable Storage	USB flash driver port
RAM Battery	Life expectancy of the RAM support battery is a minimum of 10 years, if power is not applied. Under normal operation where power is on continuously, life expectancy is much longer.
Inputs #1, #2	Optically isolated. Powered by + 24VDC supply. Built-in current source for dry contact use. (Gold plated contacts recommended)
Frequency range	Voltage/current type sensor: 0.25 to 2.0 kHz. Contact closure type sensor: 0.25 to 30 Hz. Low threshold: +1.3 VDC min. High threshold: +2.2 VDC max.
Low or High Pulse Duration	Voltage/current type sensor: 200 us min. Contact closure type sensor: 15 ms min.
Hysteresis	0.8 VDC minimum.
Input impedance	10 k-ohm typical, 500 ohm minimum.
Input source current	-2 mA nom. at 0 VDC.
Max. non-destructive input voltage	±28 peak, continuous.
Digital Output (Output #5)	Able to drive TTL, CMOS, or relay solenoids. Current sinking driver. +24 VDC internal supply, 100mA DC maximum.
Standard Communication Serial Interface UART 0	RS-232C provides support for modem. RS-485; 2 and 4 wire multi-drop. Data rate: 110 to 19200 bits/second, operator selectable from the keypad. Data format: Asynchronous, bit-serial, selectable parity, data length, and stop bits. Optical isolation: 250 VRMS max. Input Voltage: ±30 Vdc max. (RS-232C) ±15/-10 Vdc max. (RS-485). Cable length: RS-232C, 50ft [15m] max; RS-485, 4000 ft [1219m] max.
Standard Communication Serial Interface UART 2 (For use with Thermo Fisher Scientific equipment only.)	RS-485; 2 and 4 wire multi-drop in RS- 485. Data rate: 110 to 19200 bits/second, operator selectable from the keypad. Data Format: Asynchronous, bit-serial, selectable parity, data length, and stop bits. Isolation: Non-Isolated. Cable Length: 4000ft [1219m] max.

Description	Specification
Ethernet Communication	Physical: 100baseT, RJ45 Ethernet port Embedded Web server Supported Protocols: Modbus TCP, Ethernet IP.

Chapter 2
Set-Up

This chapter tells you how to start up your Micro-Tech, initialize its software, and get your Micro-Tech and its associated scale up and running. As part of the initialization process you will perform a belt-length test and, once this is done, do the initial zero and span calibrations of the scale. Your Micro-Tech is then ready to go into operation.

Using the Console

There are four major parts to the Micro-Tech console, as follows.

- Display screen
- Keypad
- Soft keys
- Status LEDs

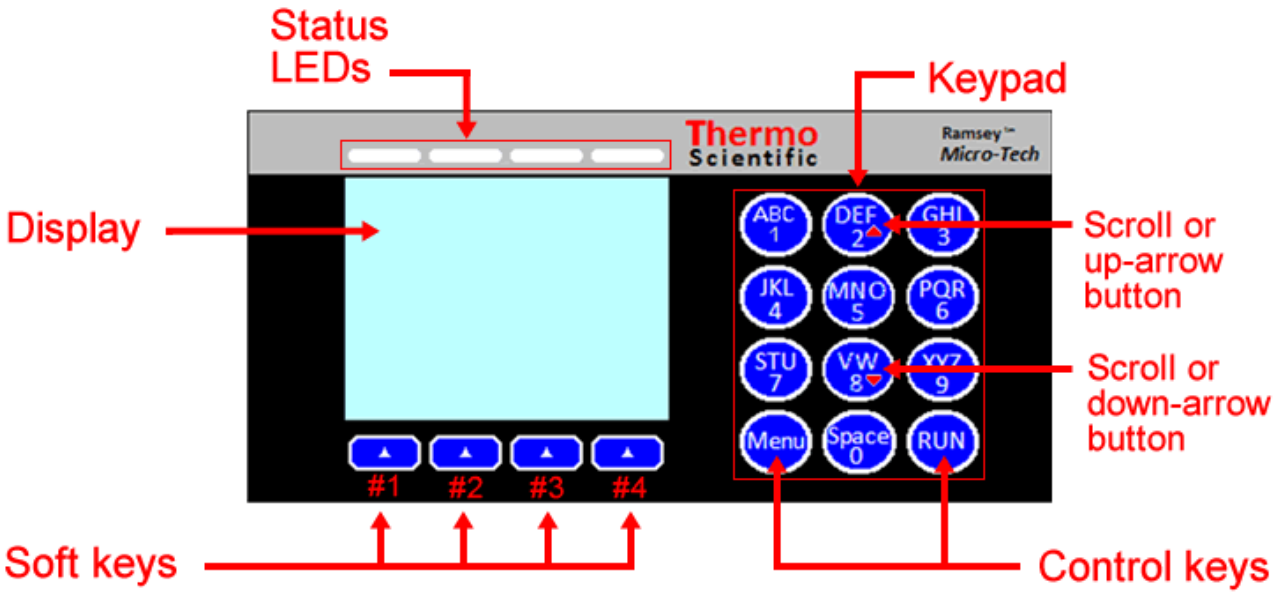


Figure 2–1. Main Features of the Micro-Tech Console

Display Screen

This displays the built-in Micro-Tech menus as well as any entries you make using the keypad. The display also shows the current functions (such as Edit, Enter, and Clear) that are assigned to the four Micro-Tech soft keys situated below the display.

Keypad

The keypad allows you to scroll through the Micro-Tech menus, enter numbers and letters into the Micro-Tech's menus, and control the operation of the Micro-Tech using the Run button. As you will already have noticed—similar to the keys on a cell phone—the Micro-Tech's number keys have multiple uses. All are context sensitive, meaning, for example, that when the Micro-Tech is displaying a *menu*, the number "8" key operates as a down-arrow key, but when the Micro-Tech is expecting you to enter a number, it operates as an "8" key. Similarly, in the print menu, when you are naming your output, repeatedly pressing the "8" key brings up, in succession, the letters *V* and *W*.

- Arrow Keys
  The up-arrow and down-arrow keys allow you to scroll through the Micro-Tech menu screens—up and down as well as left and right in some menus.

- Control Keys
  The Micro-Tech has two control keys—the Menu button and the Run button. Once the Micro-Tech is up and running, pressing the Menu button brings up the menu screens. Pressing the Run button returns the Micro-Tech to its normal operating mode.

Soft Key Buttons

The four blue keys below the display screen are "soft keys," that is, they have different functions depending on which menu you are using. The soft keys are assigned to various menu-selection and data-entry functions—such as Edit, Clear, Reset, Totals, and so forth.

Status LEDs

The status LEDs above the display, when lighted, alert you to the fact that the Micro-Tech is currently in either the Ready, Auto, Alarm, or Remote mode.

Measuring Functions

The belt feeder controller can be directly connected to six 350 ohm load cells and receives the signal of a speed sensor in order to calculate belt speed, belt loading, and feed rate.

Rate is integrated in time to calculate the amount of material conveyed by the belt (total), and is displayed in three individual registers: total, reset total, operator total. The belt feeder controller can perform automatic zero and span calibrations. When the belt is running and the rate is below a certain percentage, the Integrator can perform auto zero tracking, to minimize the error of zero due to material and dust. Analog (current) output signals or communications can be used to transmit rate, speed or belt loading to other control devices. Displayed variables and analog outputs can be smoothed via damping filters, individually programmable.

Determining the Belt-Scale Code

It is critical that you know the *correct* belt-scale code of the conveyor and scale the Micro-Tech is working with, for the following reasons.

- The scale may produce inaccurate and unreliable results if you use the wrong belt-scale code.

- The Micro-Tech software uses a belt-scale code that is *specific* to each particular system, and this belt-scale code must be entered during the software initialization process.

- Knowing the correct belt-scale code will *minimize* the amount of time and effort needed to set up the Micro-Tech.

- Non-pivoting scales have far fewer required set-up parameters than pivoting scales. As a result, if you have a *non-pivoting scale* (with a belt-scale code of 49, for example), there are only 11 required parameters. In contrast, if you have a *pivoting* scale (with a belt-scale code of 1, for example), there are 18 required parameters. So, knowing your belt-scale code in advance will make the whole set-up process go more smoothly.

The Quick and Easy Route

The quickest and easiest way to determine the belt-scale code of the scale the Micro-Tech is working with, is to look at the Micro-Tech "System Data Sheet" or "Door Label."

- System Data Sheet

  A System Data Sheet is supplied with the product documentation that accompanied your unit. See Appendix A for an example of a typical System Data Sheet.

- Door Label

  A Door Label is supplied with every Micro-Tech. For panel-mounted versions of the Micro-Tech, the Door Label is in the product documentation that accompanied your unit. For field-mounted versions, the Door Label is glued inside the main door of the enclosure. See Appendix A for an example of a typical Door Label.

If your System Data Sheet and/or Door Label is lost or defaced, table A–1 in Appendix A lists the belt-scale codes for a variety of commonly used conveyor and scale set-ups.

Once you know your belt-scale code, write it in the space below. You will need this information later when you initialize the Micro-Tech software.

Belt-Scale Code _____

HINT. Write the belt-scale code inside the front cover of this manual for future reference. ▲

Acquiring Basic System Data

Now that you know the correct belt-scale code of the scale you are using, you are ready to collect some additional data about the type of conveyor and scale you are using at your particular facility. You will need this information when you initialize the Micro-Tech software, and can save time and effort by gathering this conveyor data *now* rather than later.

Scale Type Determines Parameters Needed

The type of scale and conveyor you have installed at your facility determines the number and type of parameters you need to enter when initializing the Micro-Tech software. As a general rule, non-pivoting scales have fewer required parameters than pivoting scales. Clearly, we cannot list every single scale configuration in this manual, so we will restrict ourselves to showing you two examples to give you a feel for how the belt-scale code works and how it determines what parameters you need to know when initializing the software.

- If you have a *non-pivoting* scale—Go to the next page.
- If you have a *pivoting** scale—Go to page 2-7.

(* Also known as a lever-ratio, pivot point, or trunion scale.)

Non-Pivoting Scales

Here is a list of belt-scale codes for non-pivoting scales. (For a complete list of belt-scale codes, see table A–1 in Appendix A.)

- Non-pivoting belt-scale codes*: 43–53, 60, 214, 215.

  (* Please note that this is not an exhaustive list, because newer or custom scales are not listed.)

We suggest you print or photocopy this page and insert the required data into the table below. Doing so will save you considerable time when you come to initialize the Micro-Tech software.

Table 2–1. Initialization Data Sheet (Non-Pivoting)

Parameter*	Details of Your Particular System	Defaults from Table A–1, or other
Number of weigh idlers		4
Number of load cells		4
Idler spacing (inches)		48
Conveyor angle (degrees)		0
Load-cell capacity (lbs.)		250
Load-cell sensitivity (mV/V)		3.0
Load-cell resistance #1 thru #4 (ohms)		350
Belt length (feet)		—
Time for one belt revolution (seconds)		—
Number of revolutions for test		>3
Time to complete test revolutions (seconds)		—

* The example above, including the defaults, is for belt-scale code 49. Your weighing system will, most likely, have a slightly *different* list of required parameters and defaults.

NOTE. For more information about the parameters listed above, please see pages 2-8 through 2-12. ▲

The Next Step

You are now ready to measure the belt speed of your conveyor system. Go to page 2-13.

Pivoting Scales

Here is a list of belt-scale codes for pivoting scales. (For a complete list of belt-scale codes, see table A–1 in Appendix A.)

- Pivoting belt-scale codes*: 0–42, 54–59.

  (* Please note that this is not an exhaustive list, because newer or custom scales are not listed.)

We suggest you print or photocopy this page and insert the required data into the table below. Doing so will save you considerable time when you come to initialize the Micro-Tech software.

Table 2–2. Initialization Data Sheet (Pivoting)

Parameter*	Details of Your Particular System	Defaults from Table A–1, or other
Pivot-to-load cell distance (inches)		32
Number of weight idlers		1
Pivot-to-first-idler distance (inches)		24
Pivot-to-test weight height (inches)		0
Pivot-to-test weight length (inches)		24
Pivot-to-carriage height (inches)		6.5
Roller-to-carriage height (inches)		6.5
Number of load cells		1
Idler spacing (inches)		36
Conveyor angle (degrees)		0
Load-cell capacity (lbs.)		250
Load-cell sensitivity (mV/V)		3.0
Load-cell resistance, #1 (ohms)		350
Type of speed input		—
Belt length (feet)		—
Time for one belt revolution (seconds)		—
Number of revolutions for test		>3
Time to complete test revolutions (seconds)		—

* The example above, including the defaults, is for belt-scale code 1. Your weighing system will, most likely, have a slightly *different* list of required parameters and defaults.

NOTE. For more information about the parameters listed above, please see pages 2-8 through 2-12. ▲

Pivot-to-Load-Cell Distance

Measure the distance from the pivot to the load cell, and enter the result in table 2-1 or 2–2.

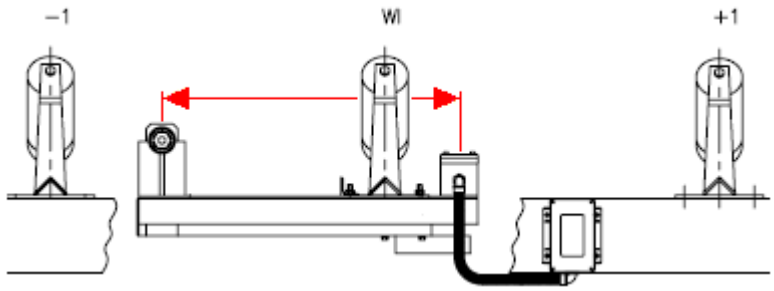


Figure 2–2. Pivot-to-Load-Cell Distance

Number of Weight Idlers

Count the number of weight idlers and enter the result in table 2–1 or 2–2.

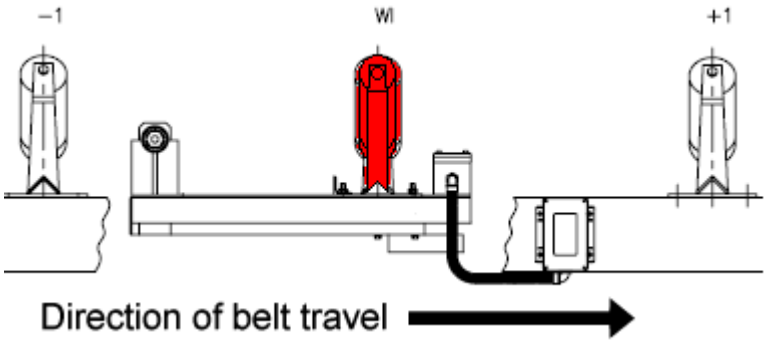


Figure 2–3. Number of Weight Idlers

Pivot-to-First-Idler Distance

Measure the distance between the pivot and the first idler, and enter the result in table 2–1 or 2–2. Please note, there may be subsequent (that is, additional) idlers.

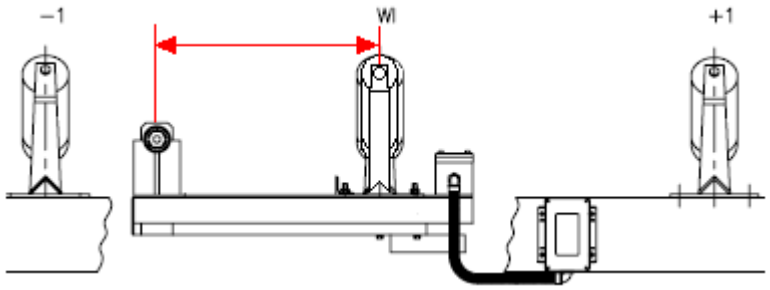


Figure 2–4. Pivot-to-First-Idler Distance

Pivot-to-Test-Weight Height

If the static-weight option is installed, measure the height from the pivot to the test weight, and enter the result in table 2–1 or 2–2. If the test weight is below the pivot, the value is negative. If this option is *not* available, leave at the default value.

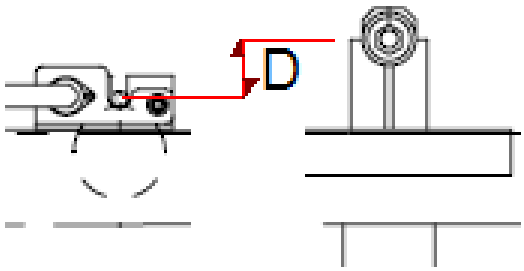


Figure 2–5. Pivot-to-Test-Weight Height

Pivot-to-Test-Weight Length

If the static-weight option is installed, measure the length from the pivot to the test weight, and enter the result in table 2–1 or 2–2. If this option is *not* available, leave at the default value.

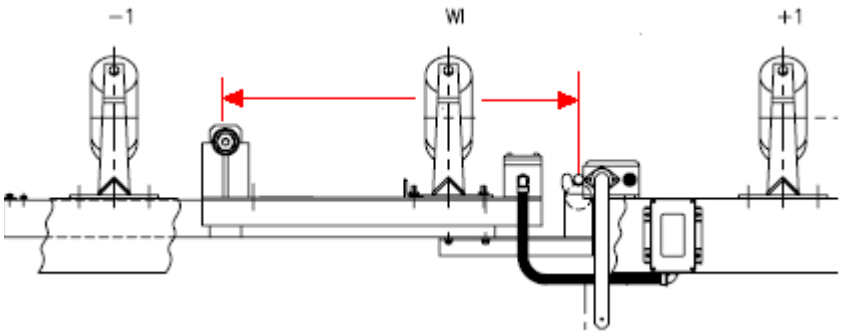


Figure 2–6. Pivot-to-Test-Weight Length

Pivot-to-Carriage Height

If the static-weight option is installed, measure the height from the pivot to the carriage, and enter the result in table 2–1 or 2–2. If this option is *not* available, leave at the default value.

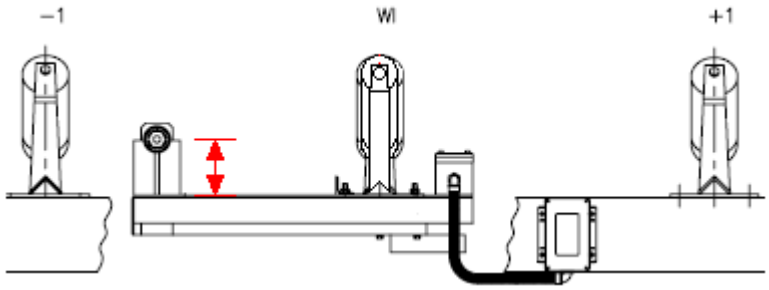


Figure 2–7. Pivot-to-Carriage Height

Roller-to-Stringer Height

If the static-weight option is installed, measure the height from the carry roller to the conveyor stringer, and enter the result in table 2–1 or 2–2. If this option is *not* available, leave at the default value.

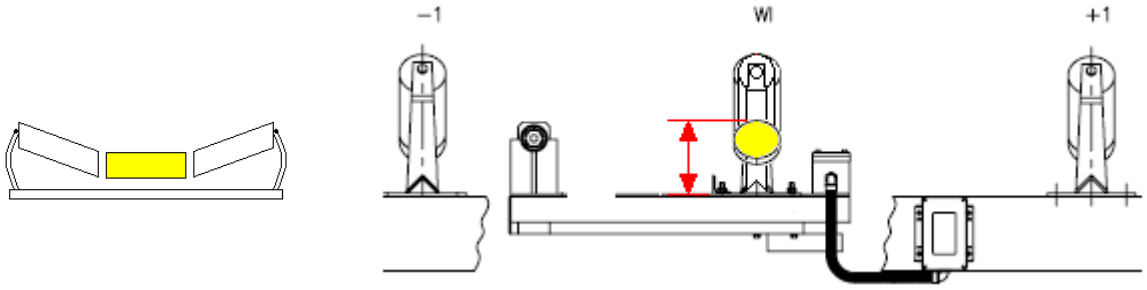


Figure 2–8. Roller-to-Stringer Height

Number of Load Cells

Determine the number of load cells, and enter the result in table 2–1 or 2–2.

Idler Spacing

Measure the idler spacing, which should all be evenly spaced, and enter the result in table 2–1 or 2–2.

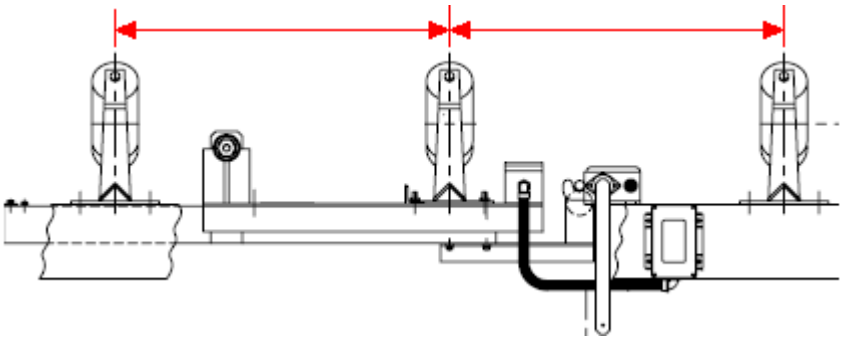


Figure 2–9. Idler Spacing

Conveyor Angle

Measure the angle of the conveyor (in degrees) and enter the result in table 2–1 or 2–2. An easy way to arrive at a measurement in degrees for angle Ø, is to measure the length AC, divide by length AB, and look up the cosine.

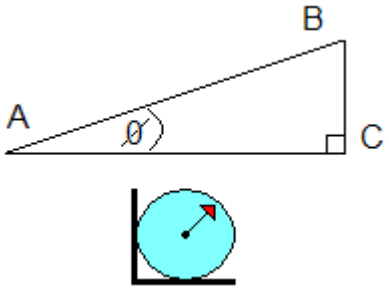


Figure 2–10. Conveyor Angle

If the conveyor slopes up, the angle is positive, meaning the conveyor has a positive incline. If the conveyor slopes down, the angle is negative, meaning the conveyor has a negative incline. The appropriate sign (+ or –) for the incline must be entered in the appropriate Micro-Tech menu (see page 2-36).

Load Cell Capacity, Sensitivity, and Resistance

All Thermo Fisher load cells have the capacity, sensitivity, and resistance marked (as shown below) on the end of the cable. In case the label is not present please refer to the data sheet supplied with the load cell. Enter the capacity, sensitivity, and resistance in table 2–1 or 2–2.

Figure 2–11. Location of Load-Cell Data

Speed Input

The Speed Input parameter tells the Micro-Tech whether your conveyor system is equipped with one (or, in some special instances, two*) optional speed sensors. An optional speed sensor feeds very precise conveyor speed readings to the Micro-Tech. If you did *not* order an optional speed sensor, enter “simulated” in table 2–1 or 2–2.

* Two speed inputs, typically, are used in systems equipped with two scales.

In summary, your choices for speed input are as follows.

- Single—Your conveyor is equipped with one speed sensor.
- Two—You have two scales, each equipped with a speed sensor.
- Simulated—There is no speed sensor attached to your conveyor. Note, however, that a conveyor-run digital input is required for the simulated option to work.

Test Duration

You are now going to measure how long it takes for the belt in your conveyor system to make *one* revolution at maximum speed. You will use this information to verify that the scale's zero and span can be properly set during the approximately six minutes it takes the Micro-Tech to complete the zero-calibration procedure and span calibration procedure.

The take-home message here is that, for the scale's zero & span to be accurate, the zero and span calibration procedures must fulfill the following requirements.

- The belt *must* make at least three complete revolutions.
- The test *must* have a total running time of six (or more) minutes.

To help you work through the necessary calculations, here is a real-life example.

Example

We have just finished installing a 56ft-long conveyor at our facility that has a belt length of 120 feet—that is, if the belt was removed from the system, cut and laid out flat, it would extend to 120 feet. Next, we need to know how long it takes for the belt to make precisely *one* revolution when running at maximum speed.

1. To do this, we drew a prominent chalk line across the belt directly above the load cell, and timed (to the nearest second) how long it took for the belt to make exactly *one* revolution. We discovered it took precisely 1 minute and 15 seconds. Thus,

   —Time for completing one revolution = 75 seconds.

2. Six minutes contain 360 seconds (6 x 60 seconds). So the number of revolutions the belt makes in 360 seconds is 4.80 (360/75).

   —Number of belt revolutions made in 6 minutes = 4.80

   —Revs rounded up to the nearest whole number = 5

   (If this number is less than 3, you *must* lengthen the time of the test so that the belt completes the required minimum of *three* complete revolutions.)

3. Because one belt revolution takes 75 seconds to complete, it takes 375 seconds (5 x 75) to complete the required test revolutions. Thus,

   —Time to complete the test revolutions = 375 seconds

4. In summary, the data we have collected so far is as follows.

   —Belt length = 120 feet

   —Time for one belt revolution = 75 seconds

   —Number of revolutions needed for test = 5

   —Time to complete the five test revolutions = 375 seconds

5. Now it's your turn to collect your own data and enter it into table 2–1 or 2–2.

Manually Determine Test Duration

You are now going to collect data from your own particular conveyor system to determine the Test Duration. Here's how.

1. Using a 100 ft tape measure, measure the length of the belt to the nearest 0.1 feet. Enter the result for "Belt Length" in your "Initialization Data Summary," table 2–1 or 2–2.

2. When the belt is stationary, draw a chalk line across the belt.

3. Start the belt and wait until it is running at *maximum* speed.

4. Use the chalk mark to time *one* complete revolution of the belt. Enter the result (in seconds) in table 2–1 or 2–2.

5. Calculate (to at least one decimal place) the number of revolutions the belt makes in six minutes—as described in the example above. Round up the number of revolutions to the next whole number. Enter the result, "Number of revolutions for test," in table 2–1 or 2–2.

6. Multiply "Number of revolutions for test" by the time taken (in seconds) for one revolution. Enter the result, "Time to complete test revolutions," in table 2–1 or 2–2.

The Next Steps

You are now going to familiarize yourself with the Micro-Tech's console, and use it to enter into the Micro-Tech all the data you entered in table 2–1 or 2–2.

Initializing the Software

This section gives you step-by-step instructions to guide you through the software-initialization process.

NOTE. You *must* complete the entire software initialization and scale-calibration procedure before putting the Micro-Tech into operation. There are no shortcuts! ▲

Overview

There are five steps in the software initialization process, as follows.

- Enter the correct date and *exact* current time.
- Choose the appropriate language for the display.
- Choose the appropriate units of measure (standard tons, long tons, metric tons, and on).
- Enter the correct belt-scale code for your particular scale.

- Enter the parameters you recorded in your “Initialization Data Summary” table above (table 2–1 or 2–2).

Cold-Starting the Micro-Tech

The first time you power up the Micro-Tech, you are doing what is known as a “cold-start.” Once the Micro-Tech is up and running, you can use the cold-start procedure (described below) to—in computer terms—“reboot” the Micro-Tech. In other words, when you do a cold start, the Micro-Tech’s RAM memory is erased and everything is returned to its initial start-up state. As a result, cold-starts are used, for example, to restore all the Micro-Tech settings from a previously made back-up flash drive.

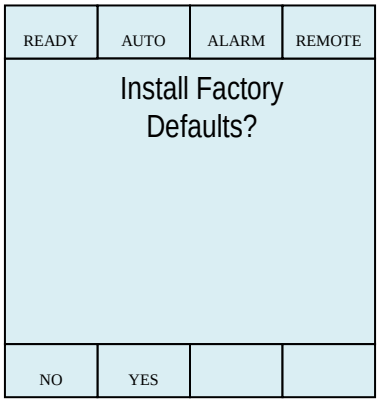
To cold-start the Micro-Tech, do the following.

1. Turn on the Micro-Tech’s power switch while *simultaneously* pressing and holding soft-key #1 and the Run button.

2. The Micro-Tech starts up, and the Alarm LED will light to indicate that the Micro-Tech has not yet been initialized or calibrated. After a brief delay the Default screen appears, as shown in the section below.

Setting the Date

You are now ready to set the current date and time. (In the following example we are going to set the date to May 21, 2013.)



1. Make sure the conveyor is empty and running at maximum speed.

2. Press the Yes button and the date screen appears.

READY	AUTO	ALARM	REMOTE
Exact date? - Date 01 – 01 – 2012 DAY 1			
EDIT			

3. Press the Edit button. (The Micro-Tech clears the Day entry field leaving just the underline.)

4. Use the keypad to enter the correct day. Remember to enter *two* numbers for day. If you make a mistake, press the Clear button. (We entered 21 for day, as shown below.)

READY	AUTO	ALARM	REMOTE
Exact date? - Date 01 – 21 – 2012 DAY 21			
EDIT			

NOTE. The Micro-Tech displays the date in the month-day-year format, and requires two numbers in the month and day fields and four numbers in the year field (MM-DD-YYYY). In addition, the Micro-Tech will *not* display the correct date in the Date line until you have completed the entire process. You can change the date and time formats later, if you would like to use a different one. ▲

5. Press the Enter button. Follow steps 3 and 4 above to enter the correct month and year.

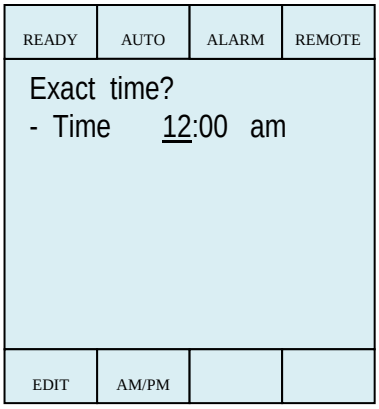
6. Press the Enter button. The display should now look something like this. (You may have to repeatedly press the Edit and Enter buttons on start up, scrolling through the fields again, to get to this screen.) Either way, make sure this screen is displayed before proceeding.

7. You are now ready to enter the correct time, as described below.

Setting the Time

In the following example we are going to set the time to 2:09 p.m. To set the correct time, do the following.

1. Press the down-arrow button. The display should currently look like this.

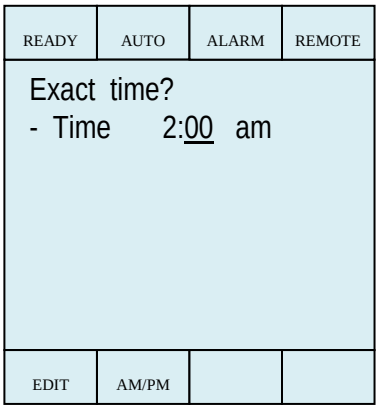


2. Press the Edit button. (The Micro-Tech clears the hour entry field leaving just the underline.)

3. Use the keypad to enter the correct hour. Remember to enter *two* numbers for hour.

4. Press the Enter button.

5. Press the *down-arrow button* to move to the minute field.

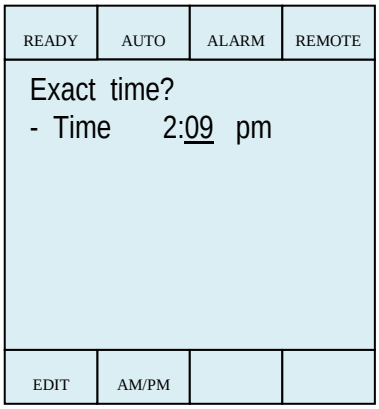


6. Press the Edit button. (The Micro-Tech clears the minute entry field leaving just the underline.)

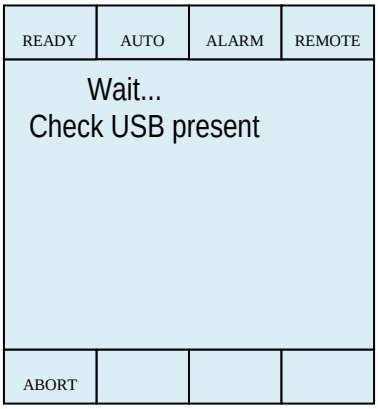
7. Use the keypad to enter the correct minutes. Remember to enter *two* numbers for minutes.

8. Press the Enter button.

9. Press the "AM/PM" button to toggle the setting to "PM." Your screen should now look something like this.



10. The time is now set. Press the *down-arrow button* to bring up the USB screen. The Micro-Tech pauses for about 10 seconds, while it checks for the presence of a flash drive in the USB port. (If you were rebooting the Micro-Tech to restore your previously saved settings, this is where you would insert the back-up flash drive into the USB port.)

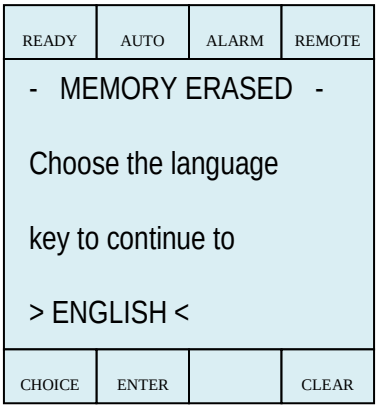


11. After waiting briefly, press the down-arrow button to bring up the language screen.

Choosing a Language

The default language shown in the Micro-Tech display is English. You can, however, choose other languages.

1. The Micro-Tech display should currently look like this.



NOTE. Ignore the "Memory Erased" message. The date and time you already entered have been retained. ▲

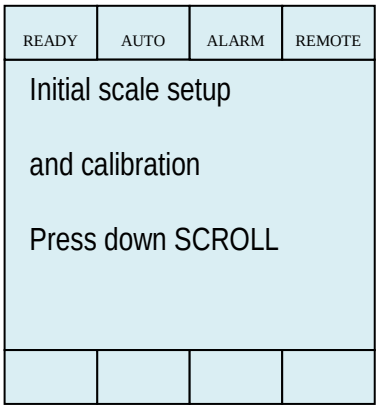
2. To select the current language, press the Enter button and the scale set-up screen appears.

3. To choose another language, repeatedly press the Choice button until the language you want is displayed, then press the Enter button.

Entering Scale Data

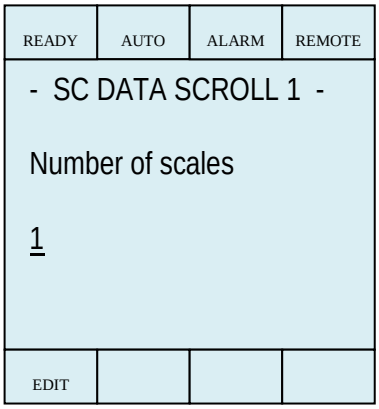
This menu allows you to enter the number of load cells and A/D (analog/digital) channels you are using with your Micro-Tech. The default value for the Micro-Tech is determined by the belt-scale code.

1. The Micro-Tech display should currently look like this.

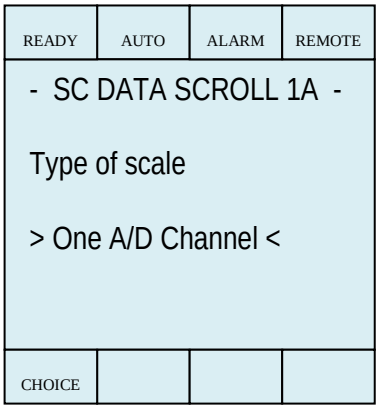


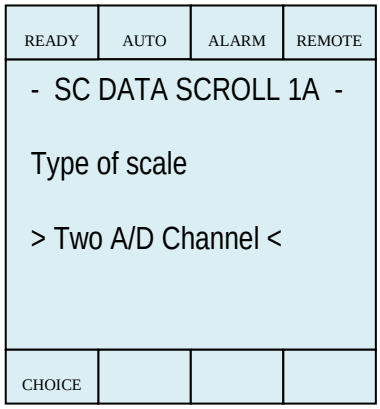
2. The Micro-Tech menus are also known as the Micro-Tech “scrolls.” Please note that the Micro-Tech keypad contains an up-scroll button and a down-scroll button, which are also known as the up-arrow and down-arrow buttons. Thus, the notation in the display saying “Press down SCROLL,” is a cue to press the down-arrow (or down-scroll) button, as described the next step (step 3).

3. Press the down-arrow button (or Scroll button) and the “Scale Data Scroll 1” screen appears.



4. Press the down-arrow button and the “A/D Channel” screen appears.





The default value is “One” A/D channel. However, if your system has two load cells, choose the “Two” A/D channels option. Review the system-specific wiring diagram to determine the number of load cells on your scale. The “Type of scale” scroll is not available on a model 9205.

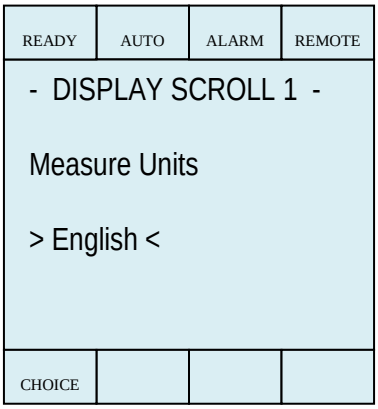
5. Press the down-arrow button to bring up the units menu.

Selecting English/Metric Units

This menu allows you to choose what units of measurement the Micro-Tech uses when displaying its results. The Micro-Tech can display information using the following units of measurement.

- Standard English units—such as pounds, standard tons, and long tons.
- Metric units—such as kilograms and tonnes.
- Both English *and* metric units. (The “Mixed” option.)

1. The Micro-Tech display should currently look like this.



2. The default selection for Measure Units depends on which Language was selected initially.

3. To choose a different selection (English, Metric, Mixed), repeatedly press the Choice button until the choice you want is displayed, then press the Enter button.

4. Press the down-arrow button to bring up the totalization units screen.

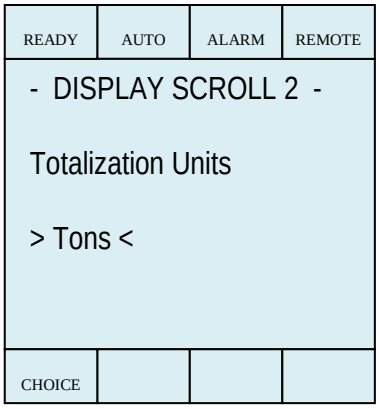
5. In pages 2-24 through 2-29, do the following.
   - Follow the “English” headings, if you are using units.
   - Follow the “Metric” headings, if you are using metric units.
   - Go to page 2-29, if you are using mixed units.

Setting the Totalization Units

This menu allows you to select the specific units of measure that are displayed by the Micro-Tech when reporting its results (known as "Totalization"). Clearly, which units of measure are available in this menu depends on the choice you made in previous topic ("Selecting English/Metric Units).

English Totalization Units

The Micro-Tech display should currently look like this, if you chose English units.



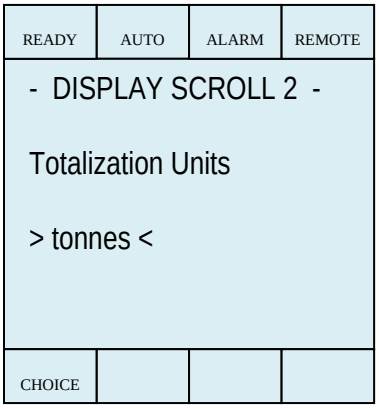
1. Tons (the standard U.S. ton, 2,000 lbs—also known as the British "short ton") is the default value.

2. To choose long tons ("LTons" 2,240 lbs) or pounds ("Pounds"), repeatedly press the Choice button until the unit you want is displayed, then press the Enter button.

3. Press the down-arrow button to bring up the length units screen (go to page 2-25)

Metric Totalization Units

The Micro-Tech display should currently look like this, if you chose metric units.



1. Metric tonnes (1,000 kg) is the default value.

2. To choose kilograms (“kg”), press the Choice button (“kg” is displayed), then press the Enter button.

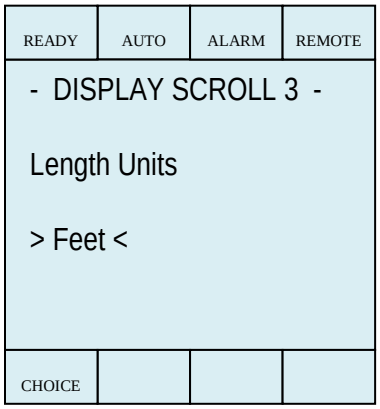
3. Press the down-arrow button to bring up the length units screen (see the next section).

Setting the Length Units

This menu allows you to choose the length units used by the Micro-Tech. Clearly, which length units are available in this menu depends on the choices you made in previous menus (English, Metric, Mixed).

English Length Units

The Micro-Tech display should currently look like this, if you chose English units.

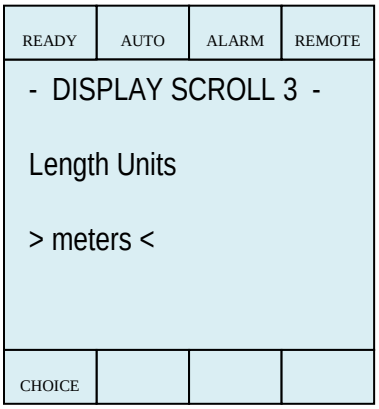


1. Feet is the default value.

2. As no other choices are available, press the down-arrow button to bring up the rate units screen (go to page 2-27).

Metric Length Units

The Micro-Tech display should currently look like this, if you chose metric units.



1. Meters is the default value.

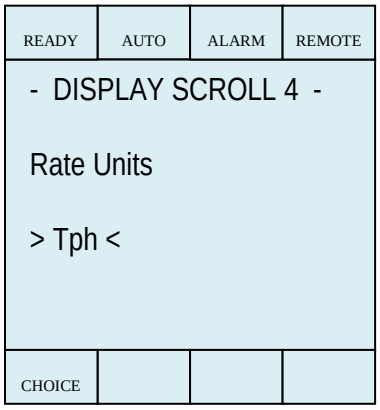
2. As no other choices are available, press the down-arrow button to bring up the rate units screen (see the next section).

Setting the Rate Units

This menu allows you to choose the rate units used by the Micro-Tech. Clearly, which rate units are available in this menu depends on the choices you made in previous menus (English, Metric, Mixed).

English Rate Units

The Micro-Tech display should currently look like this, if you chose English units.



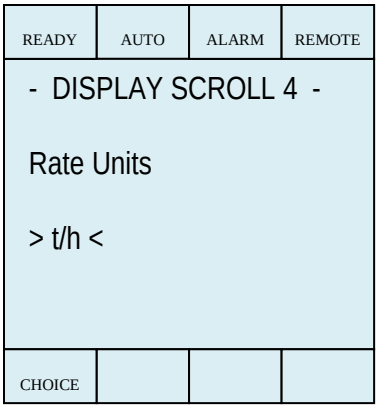
1. Standard U.S. tons (equivalent to British “short tons”) per hour (“Tph”) is the default value.

2. Repeatedly press the Choice button to select other rate units (shown below), then press the Enter button.
   - “LTph”—Long tons per hour
   - “Lb/mn”—Pounds per minute
   - “T/mn”—Standard tons per minute
   - “Lt/mn”—Long tons per minute
   - “percent %”
   - “Lb/hr”—Pounds per hour

3. Press the down-arrow button to bring up the load-cell units screen (go to page 2-30).

Metric Rate Units

The Micro-Tech display should currently look like this, if you chose metric units.



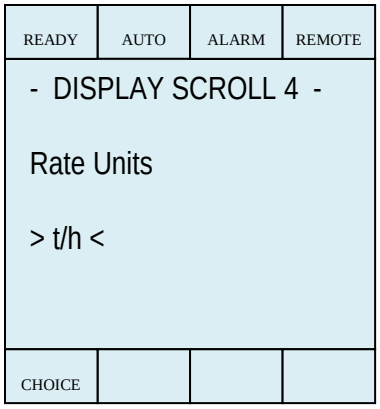
1. Metric tonnes per hour (“t/h”) is the default value.

2. Repeatedly press the Choice button to select other rate units (shown below), then press the Enter button.
   - “kg/mn”—Kilograms per minute
   - “t/mn”—Metric tonnes per minute
   - “percent %”
   - “kg/h”—Kilograms per hour

3. Press the down-arrow button to bring up the load-cell units screen (go to page 2-30).

Mixed Rate Units

The Micro-Tech display should currently look like this, if you chose mixed units.



1. Metric tonnes per hour (“t/h”) is the default value.

2. Repeatedly press the Choice button to select other rate units (shown below), then press the Enter button.
   - “Lb/h”—Pounds per hour
   - “Tph”—Standard tons per hour
   - “LTph”—Long tons per hour
   - “kg/mn”—Kilograms per minute
   - “t/mn”—Metric tonnes per minute
   - “Lb/mn”—Pounds per minute
   - “T/mn—Standard tons per minute
   - “LT/min”—Long tons per minute
   - “percent %”
   - “kg/h”—Kilograms per hour

3. Press the down-arrow button to bring up the load-cell units screen (see the next section).

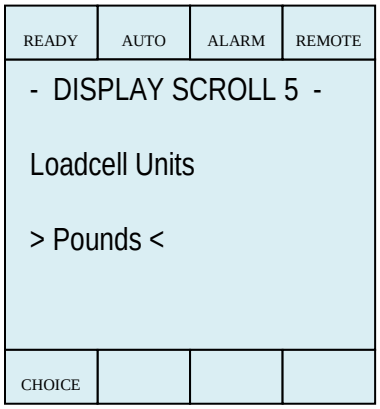
Setting the Load-Cell Units

As a general rule, when setting the load-cell units, use the following as a guide.

- If you are using English units, select pounds.
- If you are using metric units, select kg.

The only choices in this menu are to use either pounds or kilograms.

The Micro-Tech display should look something like this.



1. Accept the default value (“Pounds” or “kg”).

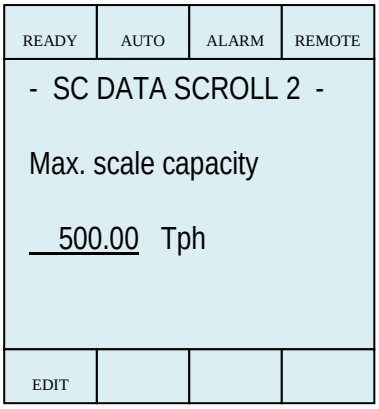
2. To choose a different load-cell unit (for example because you are using a custom load cell in your particular application), press the Choice button, then press the Enter button.

3. Press the down-arrow button to bring up the maximum scale-capacity screen (see the next section).

Entering the Maximum Scale Capacity

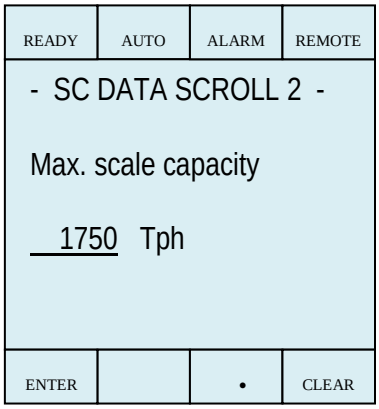
This menu allows you to enter the maximum scale capacity of the particular scale you are using in your facility. Please note that the maximum scale capacity is expressed as a *rate*—for example, tons per hour (Tph), tonnes per hour (t/h), and so on. In other words, do *not* enter the maximum weight the scale can be loaded with, because the Micro-Tech is looking for a rate.

The Micro-Tech display should look something like this, depending on the choices you made in the menus above.



1. To enter the maximum capacity of your particular scale, press the Edit button and use the keypad to enter the appropriate value, using the decimal point, if needed. In addition, please note the following.
   - If you need to enter a value such as 1234.5 tons per hour, soft key 3 allows you to enter the decimal point. (See screen shot below.)
   - There cannot be more than three numerals after the decimal. (Thus, 12.345 is allowed but not 12.3456, which will be truncated to three decimal places.)
   - Whatever value you enter cannot contain more than *seven* characters, including the decimal point.
   - The maximum rate (that is, the scale capacity) cannot exceed 200,000 units of measure.

2. We entered 1,750 tons per hour (Tph), as shown below.



3. Press the Enter key.

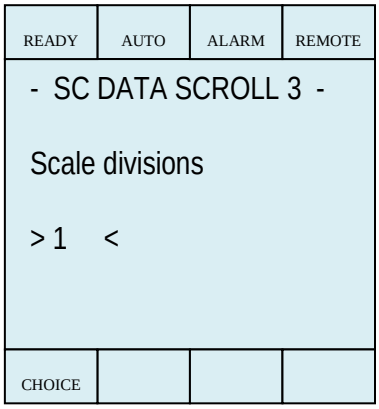
4. Press the down-arrow key to bring up the scale-divisions screen.

Entering the Scale Divisions

This menu allows you to tell the Micro-Tech how to report the quantity of material that crosses the scale in one hour. For example, if 1,750 tons cross the scale in an hour and you want the results reported to *one* decimal place (that is, to the nearest 200 lbs.), you would choose a scale division of 0.1. As a result, hourly rates would be reported as—for example—1742.8 Tph (tons per hour).

Please note that the choice of division has no bearing on the accuracy of the underlying numbers, and that if your control system contains a PLC (programmable logic controller), you may need to choose a smaller (or larger) scale division.

The Micro-Tech display should look something like this.



1. The Micro-Tech displays an appropriate scale division depending on the value you entered in the “Maximum Scale Capacity” menu. Possible scale divisions are 50, 20, 10, 5, 2, 1, 0.5, 0.2, 0.1, 0.05, 0.02, and 0.01.

2. To choose the appropriate scale division, press the Choice button until the division you want is displayed, then press the Enter button.

3. Press the down-arrow key to bring up the belt-scale-code screen.

Entering the Belt-Scale Code

This menu requires you enter the *belt-scale code* for the particular scale you are using in your facility. The current weigh-bridge configurations offered by Thermo Fisher Scientific as well as the necessary belt-scale codes, are listed in table A–1 in Appendix A. In addition, your specific weigh-bridge configuration should be listed on the “Scale Data Sheet” and the “Door Label” that accompanied your Micro-Tech.

The Micro-Tech display should look like this.

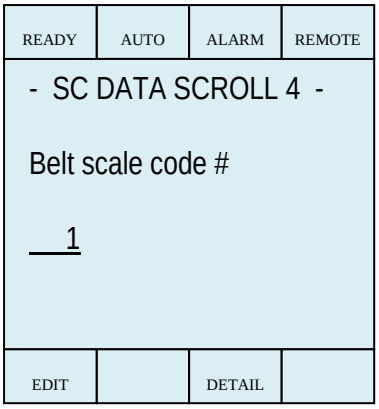


Figure 2–12. Belt-Scale-Code Entry Screen

NOTE. You *absolutely must* enter the correct belt-scale code in this menu for the Micro-Tech to work properly with your particular weighing system. This is the most critical step in the entire set-up process! ▲

1. To enter the correct belt-scale code, press the Edit button and use the keypad to enter the appropriate value.

2. Press the Enter button to return to the belt-scale-code entry screen.

Entering the Appropriate Conveyor Data

Depending on which belt-scale code you selected, the Micro-Tech will now display a list of the conveyor and scale parameters it needs to know to work properly with your particular system. You should already have entered the needed values in table 2–1 or 2–2.

The basic idea here is to press the Details button, then repeatedly press the down-arrow button, which allows you to scroll through a list of parameters to make quite sure they are correct.

NOTE. You *must* check the conveyor values suggested by the Micro-Tech. If there is a mismatch between the suggested values and the *actual* values for your particular conveyor system, you *must* enter the correct values into the Micro-Tech. Incorrect parameters in these menus may lead to inaccurate weight readings when the Micro-Tech is put into operation. ▲

To check the parameters, do the following.

1. The first thing to do is to locate the Micro-Tech's System Data Sheet (see Appendix A for an example of what this looks like) and grab your filled-in copy of table 2–1 or 2–2. Make sure you have these in front of you, as you work through the following Micro-Tech set-up menus.

2. Make sure the screen shown in figure 2–11 above is currently being displayed.

3. Press the Details button, and the first parameter appears. Your list of parameters will, most likely be different, from the ones shown

below. These are just *examples* of a typical set-up menu, and are here to show you how the process works. The general outline is the same for all systems, but the specifics may be different.

Pivot-to-Load-Cell Distance

The pivot-to-load cell distance is explained in figure 2–1. Check the value. Press the down-arrow button to move on.

Number of Weigh Idlers

Check the value, then press the down-arrow button to move on.

Pivot-to-First-Idler Distance

The pivot-to-first-idler distance is explained in figure 2–3. Check the value. Press the down-arrow button to move on.

Pivot-to-Test-Weight Height

The pivot-to-test-weight height is explained in figure 2–4. Check the value. Press the down-arrow button to move on.

Pivot-to-Test-Weight Length

The pivot-to-test-weight length is explained in figure 2–5. Check the value. Press the down-arrow button to move on.

Pivot-to-Carriage Height

The pivot-to-carriage height is explained in figure 2–6. Check the value. Press the down-arrow button to move on.

Roller-to-Stringer Height

The roller-to-stringer height is explained in figure 2–7. Check the value. Press the down-arrow button to move on.

Number of Load Cells

Check the value, then press the down-arrow button to move on.

Idler Spacing

The idler spacing is explained in figure 2–8. Check the value. Press the down-arrow button to move on.

Conveyor Angle

The conveyor angle is explained in figure 2–9. The default value is zero degrees, meaning your conveyor runs in the horizontal position.

1. If the conveyor runs at an incline, (positive or negative), press the Edit button.
2. Use the keypad to enter the correct angle. (The default is a *positive* incline.)
3. To enter a negative incline, press the "+/–" button to display a negative sign in front of the number.
4. Press the Enter button.
5. Press the down-arrow button to move on.

Load Cell Capacity, Sensitivity, and Resistance

Every load cell has a cord to which is attached a label that displays the capacity, sensitivity, and resistance of the load cell. Please refer to figure 2–10 for information about locating this label. You must enter the resistance separately for each load cell.

Setting the Speed Input

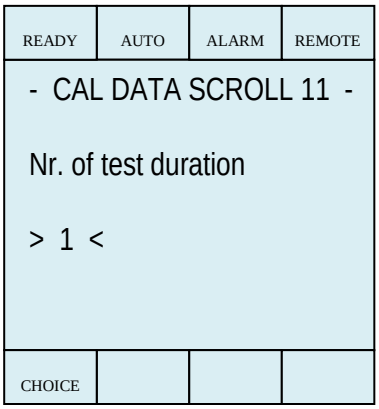
For more information about speed inputs, see page 2-12. Your choices in this menu are as follows.

- Single—Your conveyor is equipped with one speed sensor.
- Two—You have two conveyors, each equipped with a speed sensor.
- Simulated—There is no speed sensor attached to your conveyor(s).

Establish Test Duration

To start entering the data the Micro-Tech needs to establish the test duration for your scale, do the following.

1. Use the arrow buttons to navigate to the Test Duration screen, which looks like this.

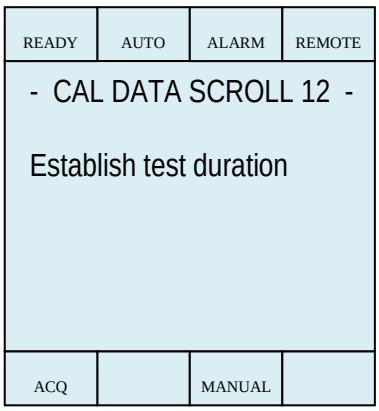


Nr. = Number.

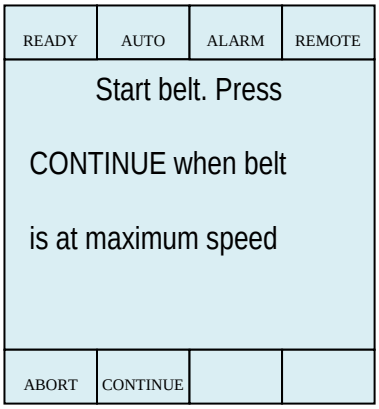
The zero test can be either “long” or “short.” You should *always* use the long test when initializing the Micro-Tech. The long and short tests are assigned the following code numbers.

- Long-duration test = 1
- Short-duration test = 2

2. To accept the long-duration test (code = 1), press the down-arrow button and the following screen appears.

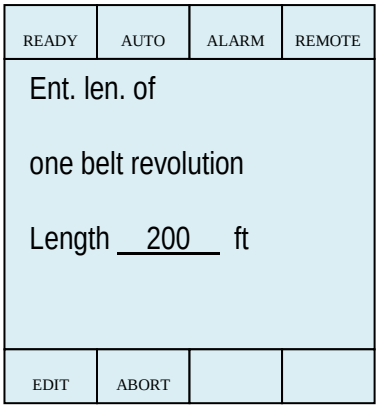


3. Press the Manual button and the following screen appears.



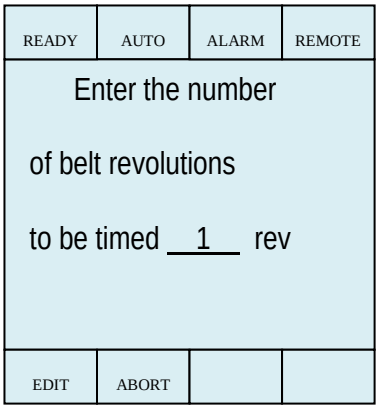
NOTE. The belt must be running *empty* and at maximum speed during the procedure to establish the appropriate test time. Pressing the Abort button at any time returns you to the "Establish Test Duration" screen. ▲

4. Start the belt and, when it is running at maximum speed, press the Continue button. The following screen appears. (The default value is 200 feet.)



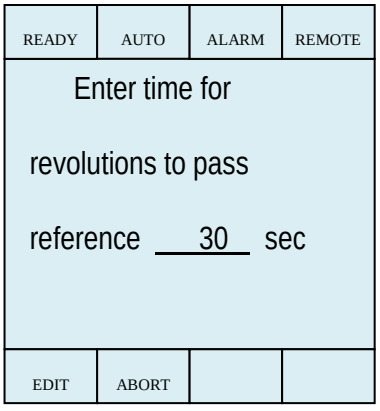
5. Press the Edit button and use the keypad to enter the length of the belt. (We entered 120 feet, as described in our example on page 2-13)

6. Press the Enter button and the following screen appears.



7. Press the Edit button. Use the keypad to enter the number you calculated earlier (and entered in table 2–1 or 2–2) for the "Number of revolutions for test." (We entered 5 revolutions, as described in our example on page 2-13.)

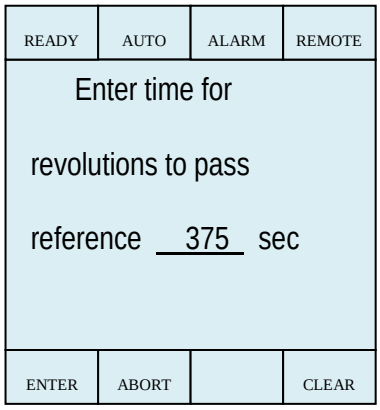
8. Press the Enter button and the following screen appears. (The default value is 30 seconds.)



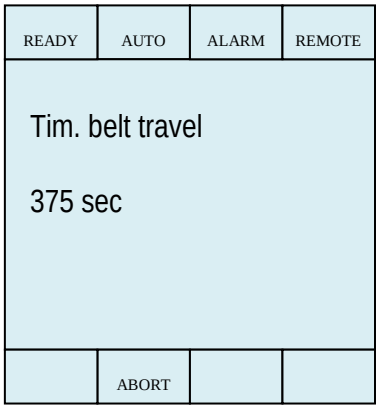
9. Press the Edit button. Use the keypad to enter the number you calculated earlier (and entered in table 2–1 or 2–2) for the "Time to

complete test revolutions." (We entered 375 seconds, as described in our example on page 2-13.)

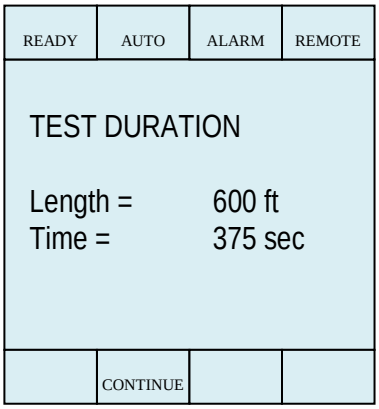
10. Your screen should now look something like this.



11. Press the Enter button and the following screen appears. The time display will start counting down to zero. The Micro-Tech is now performing the initial zero calibration—as shown by the Calibration LED, which comes on.

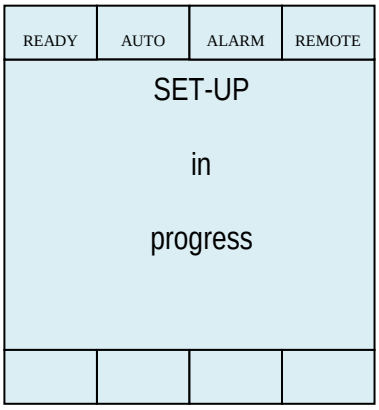


12. When the count-down reaches zero, the following screen appears, telling you how many feet of belt in total was tested, and the time (in seconds) it took to complete the test. (The data in your screen will, of course, be different.)

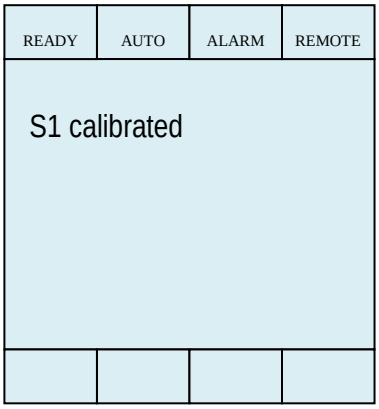


(In our example, belt length =120 ft. So, 600 feet [120 x 5] were tested during five revolutions of the belt.)

13. Press the Continue button and the following screen appears. The Micro-Tech is now setting the appropriate span number for the scale.

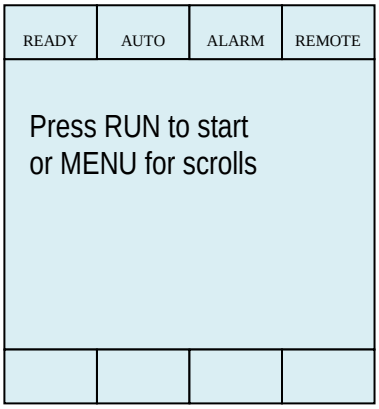


14. When the span number has been set, the following screen appears briefly in the display. Notice that the red “Alarm” LED in the console goes off and the green “Ready” LED comes on.

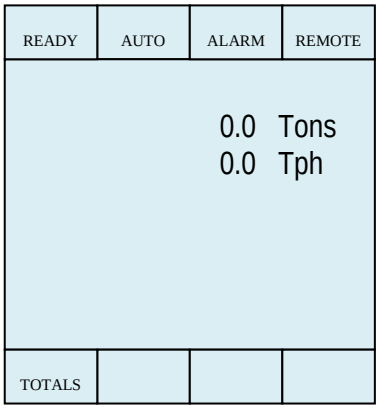


If you get an “S1 not calibrated” message, check all the numbers you entered in your Initialization Data Summary table (table 2–1 or 2–2). Then go back to the “Entering the Appropriate Conveyor Data” section above (see page 2-34) and carefully re-enter all the data into the Micro-Tech. If the calibration fails again, check the load cell (or cells) are working and sending signals to the Micro-Tech.

15. After a brief pause, the following screen appears.



16. Press the Run button and the Micro-Tech Run screen appears, which looks like this.



Continue with the following steps, finishing with "Calibrating the Micro-Tech" section to perform the initial zero and span calibrations for your scale. This is a *very important* step, because the scale will not give accurate readings until these calibrations are done.

Running the Micro-Tech

To run the Micro-Tech, do the following.

1. Make sure the Micro-Tech is powered up.

2. Make sure the Run screen (see below) is currently being displayed.

3. Start the conveyor running and begin loading it up.

Run Screen

The screen below is known as the Run screen. it shows the total tons (Tons) that have crossed the scale since the values were last reset, as

well as the tons per hour (Tph) of material that is currently running over the scale.

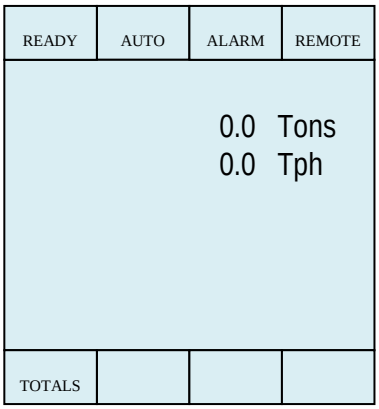
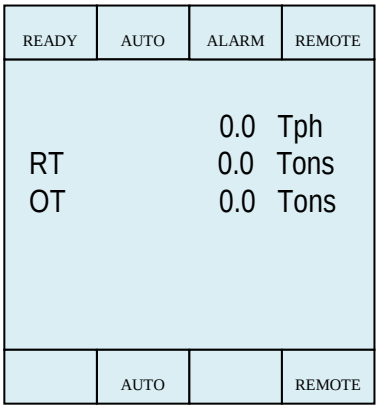


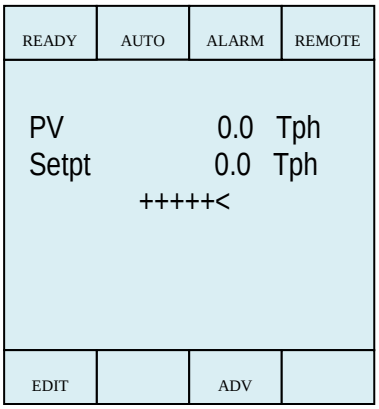
Figure 2–13. Run Screen

By pressing the down arrow key the 2nd Run screen can be accessed. The 2nd Run Screen shows Rate on line 1, Reset Total on line 2, and Operator total on line 3. This screen also has the AUTO and REMOTE softkeys. The AUTO softkey is used to switch between Automatic or Manual control. The REMOTE softkey is used to switch between Remote or Local setpoint.



2nd Run Screen

The Control Run screen can be accessed by pressing the down arrow key.



Control Run Screen

Calibrating the Micro-Tech

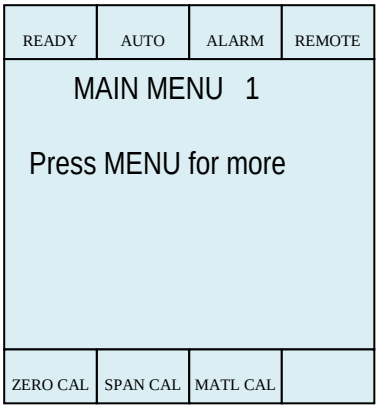
Depending on your particular application, the Micro-Tech should be calibrated on a daily, weekly, monthly, or other regularly scheduled basis. You should run the zero calibration routine often to ensure that the accuracy of the scale is optimized.

Doing a Zero Calibration

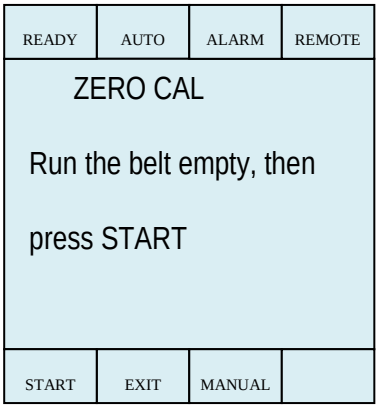
To run a zero calibration on your scale, do the following.

1. Make sure the Run screen is currently being displayed.

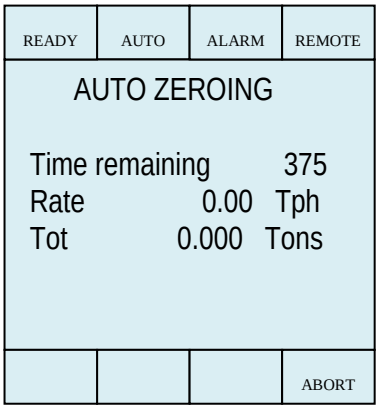
2. Press the Menu button and the “Main Menu 1” screen appears.



3. Press the Zero Calibration button and the following screen appears.

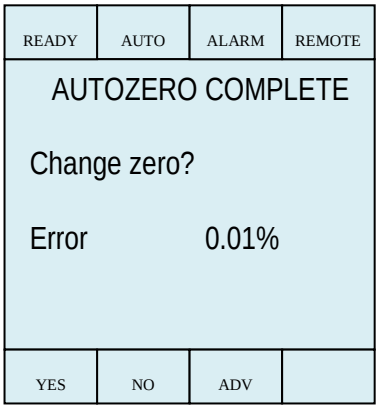


4. Make sure the belt is running empty and at maximum speed, then press the Start button. The count-down screen appears. (The data in your screen will, of course, be different.)



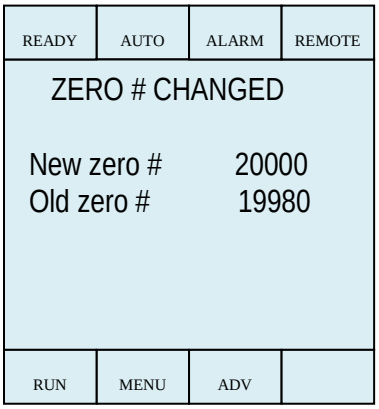
NOTE. The number of seconds shown in "Time remaining" is calculated based on the current speed-sensor pulse frequency, and estimates the time remaining for a complete test. ▲

5. The calibration time (in seconds) that you established during the Micro-Tech cold-start procedure, will start counting down. When the counter reaches zero, the calibration is complete and the change-zero screen appears.



In our example, the display shows that the newly established zero is just 0.01% different from the previous zero, meaning that both zeros are essentially the same and the scale is performing consistently. However, as there has been a small amount of drift, we decide to reset the zero to the newly established zero point.

6. Press the Yes button to accept the new zero, and the zero-changed screen appears.



7. Press the Run soft key in the display to return the Micro-Tech to the Run mode.

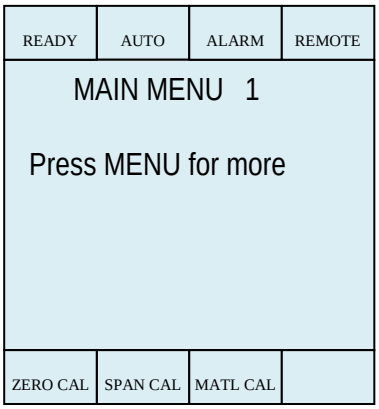
8. Run several zero calibrations to assess the repeatability of the readings.

Doing an R-Cal Span Calibration

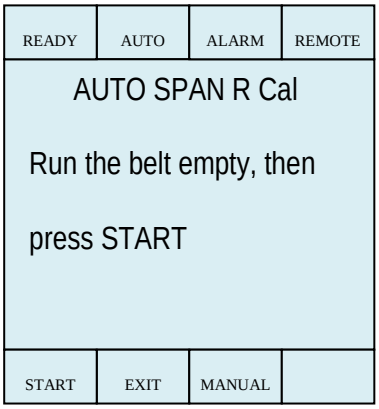
To perform an R-Cal span calibration for your scale, do the following.

1. Make sure the Run screen is currently being displayed.

2. Press the Menu button and the “Main Menu 1” screen appears.



3. Press the Span Calibration button and the following screen appears.



4. Make sure the belt is running empty at maximum speed, then press the Start button. The count-down screen appears. (The data in your screen will, of course, be different.)

READY	AUTO	ALARM	REMOTE
AUTO SPANNING			
Time remaining 375			
Rate 150 Tph			
Tot 0.000 Tons			
			ABORT

NOTE. The number of seconds shown in "Time remaining" is calculated based on the current speed-sensor pulse frequency, and estimates the time remaining for a complete test. ▲

5. The calibration time (in seconds) that you established during the Micro-Tech cold-start procedure, will start counting down. When the counter reaches zero, the calibration is complete and the change-span screen appears.

READY	AUTO	ALARM	REMOTE
AUTOSPAN COMPLETE			
Change span?			
Error 0.01%			
YES	NO	ADV	

Performing an R-Cal For the First Time During Initialization

If you are performing an R-Cal for the *first time* as part of the Micro-Tech initialization process, make sure that the R-Cal error is less than 0.75%. (If the error is greater than 0.75%, there may be a problem. See the manual's the troubleshooting section on page 3-1 for additional help.)

(The numbering below is continued from the previous page.)

6. Press the Yes button to set the span.

7. Press the Run button (in the display not the keypad) to return the Micro-Tech to the Run mode. Congratulations! You are now ready to put your Micro-Tech into operation.

Performing Any Subsequent R-Cal

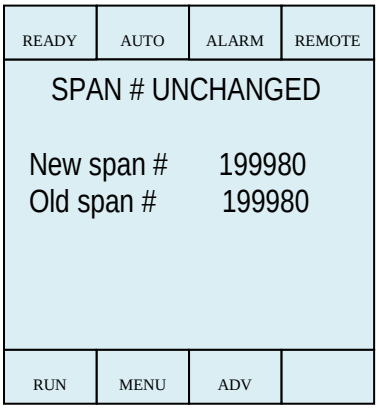
Once you have initialized your Micro-Tech and are doing an R-Cal as part of your weekly, daily, or other routing testing, proceed as follows.

In the example screen above, the display shows that the established span is just 0.01% different from the previous span, meaning that both spans are essentially the same and the scale is performing consistently. This error is below the critical threshold error of 0.5% (or 0.25% for a Model 9205 integrator). As a result, the span should *not* be changed. Record the span results for future reference.

However, if the error is greater than 0.5% (0.25% for Model 9205 integrator), there may be a problem—see the manual's troubleshooting section in the following chapter for additional help. Record the span results for future reference.

(The numbering below is continued from page 2-49.)

6. This is important! Press the No button (that is, *do not change* the span) and the following screen appears. (Your numbers will, of course, be different.)



7. Press the Run soft key in the display to return the Micro-Tech to the Run mode.

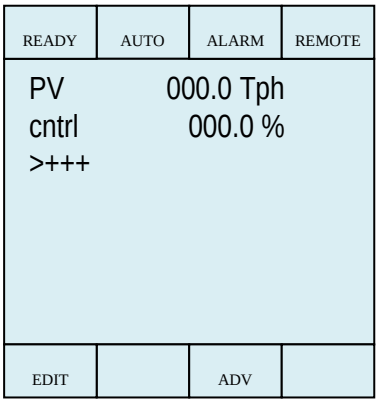
8. Run several span calibrations to assess the repeatability of the readings.

Controller Outputs

The belt-feeder controller output can be PID or PEIC control. PEIC control can be an analog output or time proportional “increase/decrease” digital outputs.

Control Run Screen

The Control Run screen allows you to view the belt-feeder controller’s setpoint, process variable, and controller action. From the Run screen, press the down-scroll key for access, or press the up-scroll key to return to Reset Total or Run Menu. Pressing Run does not return to Main Run.



Here is a description of the functions available in this screen.

- Edit Button—The Edit key is only displayed when the variable in line 2 of the screen is enterable.

- Advance Button—Pressing the Advance button accesses the following functions.
  - Control Output %—Controller output can be manually changed from 0 to 100%, when the Auto/Manual selection is Manual.
  - Setpoint—Setpoint can be entered from the controller front panel when Local/Remote selection is Local.
  - Error %—Indicates error in percentage between setpoint and process variable.
  - Bar Graph—The bar graph on line 3 displays process variable and setpoint deviation. The bar’s resolution is 2%.

Chapter 3
Maintenance and Troubleshooting

The maintenance information in this manual should meet your service needs. If problems occur requiring technical assistance, please call 1-800-445-3503 or the local Thermo contact listed in Chapter 4. Thermo Scientific has a repair center located at our plant in Minneapolis, Minnesota. Contact one of our technical representatives at 1-800-445-3503 for assistance or the local Thermo contact listed in Chapter 4. To expedite your service request, please have your Micro-Tech model, serial number, and belt-scale code available.

Critical Checkpoints

The Micro-Tech Integrator is a solid-state device and should require very little maintenance. The front panel can be wiped clean with a damp cloth, and if necessary, a mild detergent (never use abrasive cleaners, especially on the display window). As a preventative measure, check to ensure all wires, plugs, and integrated circuits are tight in their connectors. Also, keep the enclosure door tightly closed to prevent dirt infiltration. More often than not, a quick visual inspection leads to the source of trouble. If a problem develops, check the following before proceeding to more specific troubleshooting procedures.

- Check Power
  - Check the fuse.
  - Check that the power switch is ON and that power is supplied to the unit.
- Check Connections
  - Check that all terminations are secure.
  - Check to ensure the display, module, and keypad connectors are firmly seated in their connectors.
  - Check that all jumpers are in their correct position.

Frequently Asked Questions

Here is a list of frequently-asked questions (FAQs) to help you resolve common problems and concerns about operating, calibrating, and maintaining your scale.

Question	Answer
What is the best way to calibrate my scale?	The best way to calibrate your scale is to use the "Material Calibration" method. (For details, see the 9105/9205 Reference manual.) If, for whatever reason, you cannot perform a Material Calibration on your scale, you can run a number of "simulated-calibration" tests. For example, all Micro-Techs can be calibrated using the "R-Cal" procedure, but you must have purchased the optional equipment allowing you to run these simulated tests.
How often should the zero and span be calibrated?	As a general rule, if you make or receive payments based upon the weight readings from your scale, the scale should be zeroed daily and the span checked weekly. • Your scale is only as good as the repeatability of your error on repeated zero calibrations. • The span should never change drastically, if the zero is properly maintained. If an external contractor is responsible for maintaining your scale, he or she will establish an appropriate schedule for testing your scale's zero and span.
How often should I check the mechanical installation of the scale?	The scale should only need daily preventive-maintenance checks for material build up in critical areas, such as under the weigh idlers. The exception to this is, when changes are made to the scale area—for example, when the belt or idlers are replaced. The scale area includes not only the weighbridge, but also the idlers that are shimmed with scale. • A 10-20-1 scale system's scale area includes +3 to -3 of scale. • A 10-14-4 scale area includes +5 to –5. Any maintenance in this area should be realigned, shimmed, and spaced to the proper specifications. If in doubt, please contact Thermo Fisher Scientific for the correct specifications.
Why do I need to see repeatability during calibrations?	The repeatability of a scale is important for the accuracy of the scale. If the scale cannot repeat tests within the scale's percentage of accuracy, then you should investigate why the scale is not repeating within the appropriate tolerances.
Every time I complete a zero or span test and get a percentage of error, do I say "Yes" each time to change the zero or span?	The only time you should change zero or span is on the initial, start-up test. Press the "Yes" button to change the span. In any subsequent test, even when there is an error, press the "No" button—as any additional tests are for repeatability, which is a maintenance feature of calibrations.

Question	Answer
Can I put a 100 lb. weight on the weighbridge and see a reading of 100 lbs. in the Run screen?	The short answer is “No,” because a weight is not a rate. The signal delivered by the load cell or cells, which represents the weight per unit length of the belt (lbs./ft), is multiplied by the signal delivered by the speed sensor, which represents the belt speed (ft/min). The result of this operation is the instantaneous flow rate (lbs./ft x ft/min = lbs./min), which is then multiplied by a suitable constant to obtain the value in the required engineering units (kg/h, Tph, and so on). An adjustable damping filter is provided separately for the displayed rate and current outputs.
What kind of information is available from the digital output?	The programmable outputs are as follows. • Alarm cumulative • Shutdown cumulative • Ready • High load • Low load • High rate • Low rate • High speed • Low speed • Totalization pulse (remote counter) • Print ready • Load weights • Out of range • Deviation alarms

Chapter 4
Service, Repair, and Replacement Parts

Listed below is information about how to get help servicing, repairing, and obtaining replacement parts for your Micro-Tech. In addition, Thermo Fisher Scientific provides experienced, on-site service technicians who can assist you with installing, setting up, calibrating, maintaining, and repairing your Micro-Tech. They can also help you train your operators and solve virtually any Micro-Tech-related problem.

Overview

For a detailed list of the spare parts available for your Micro-Tech, please see the Parts List in table 4–1 on page 4-4.

Before returning the Micro-Tech or any other equipment to Thermo Fisher Scientific, you must contact your nearest Thermo Fisher Scientific office for a Return Material Authorization (RMA) number, which will authorize you to make the return. In addition, you will need to complete the appropriate RMA Form, Product Information Sheet, and Hazard Declaration Form before returning anything to Thermo Fisher Scientific.

For more information about contacting Thermo Fisher Scientific, see page 4-3.

RMA

The Return Material Authorization (RMA) form you will need before returning your Micro-Tech to Thermo Fisher.

Getting Ready to Order

The quickest way to get the parts you need for your Micro-Tech is to do the following.

1. Identify the broken or faulty parts.

2. See whether the part is shown in table 4–1, which lists parts that may need to be replaced. Note the part number from the table. If the part is not listed in the table, contact Thermo Fisher Scientific directly (as described in the following pages).

3. Before you contact Thermo Fisher Scientific for commonly needed parts, make sure you have the following information ready.

- Your Micro-Tech serial number and belt-scale code.
- Your company's purchase order (PO) number. Please note that a *hard copy* of your PO is required before parts can be sent. In addition, your PO must reflect the current and correct prices for all parts ordered. So, please email or fax us your PO to expedite the process.
- The date the parts are needed.
- Your preferred shipping method.
- A list of all the part numbers—together with descriptions and the quantities needed.

4. Then contact Thermo Fisher Scientific by email, fax, or telephone—as described on the following page.

WARNING. Major repairs and/or modifications to your Micro-Tech *must* be performed by Thermo Fisher Scientific personnel. ▲

Contacting Thermo Fisher Scientific

Please verify and write down your Micro-Tech model number and serial number *before* contacting us. Things will go a lot more quickly and efficiently once we know this information.

North America
1-800-445-3503
1-763-783-2525
Service.bulk.us@thermofisher.com
parts.bulk.us@thermofisher.com

Brazil
+55-11-2367-2192
+55-11-2367-2192 fax

Germany
+49 (0) 208-824930
+49 (0) 208-852310 fax
service.oberhausen@thermofisher.com

Chile
+56 2 2378 5080
+56 2 2370 1082 fax

Italy
+39 02-959514-1
+39 02-953200-15 fax
service.bulk.emea@thermofisher.com

China
+86 10-8419-3588
+86 10-8419-3580 fax

Spain
+34 91-484-5965
+34 91-484-3597 fax

India
+91-22-4157-8800
+91-22-4157-8801 fax

United Kingdom
+44 (0) 1452-337800
+44 (0) 1452-415156 fax

Mexico
+52 55 1253 9410
+52 55 1253 9424 fax

Australia
+61 (0) 8 8208-8200
+61 (0) 8 8234-3772 fax
service.auadl@thermofisher.com

South Africa
+27 (0) 11-609-3101
+27 (0) 11-609-3110 fax

Parts List

Here is the parts list for your Micro-Tech.

Table 4–1. Micro-Tech Parts List

Description	Part Number
PCBA,MOTHERBOARD,MT9105	127654
DISPLAY,LCD,6 DIGIT,QVGA,MT9000	100775
PCBA,HMI BOARD,MT9000	100802
CONN,PWR,3POS,3.81MM,HDR,M	100781
POWER SUPPLY,SGL, 24V, 3.2A	100755
CABLE,USB,M/F,2.0,1.6FT,PNL MT	100792
PCBA, ANALOG I/O BOARD, MT9000	102949
PCBA, 4-20MA OUTPUT BD, 1 CH, MT9000	100744
PCBA, DC INPUT BD, MT9K	100785
PCBA, PLANT A/D BD, MT9000	102450
PCBA, OPTO-22 INPUT, MT9000	102999
PCBA, OPTO-22 OUTPUT BD, MT9000	103003
PCBA, RELAY OUTPUT BD, MT9000	102479
PCBA, COMM BOARD, MT2K/9K	102942
PCBA,PREMIUM A/D BD,MT-9000	100766
PCBA,PROFIBUS BD,MT2000/MT9000	102936
PCBA, DIO, 8IN / 8OUT	103017
MODULE,POWER,IN,140VAC, G4- 5	038014
MODULE,POWER,IN,280VAC, G4- 5	050480
MODULE,POWER,IN, 32VDC, G4- 5	044551
MODULE,POWER,OUT,240VAC, G4- 5	037289
MODULE,POWER,OUT, 60VDC, G4- 5	039669
MODULE,POWER,OUT,DRY,N/O,G4- 5	044552
FUSE, FAST-BLOW, 2A, 250V, 5X20MM	103190
DRIVE,FLASH,USB 2,4GB,BRANDED	112183

Appendix A
Additional Installation Information

System Data Sheet

The following page shows a copy of a typical System Data Sheet for the Micro-Tech.

SYSTEM DATA SHEET

ThermoFisher SCIENTIFIC

501 90th Avenue N.W. - Minneapolis, Mn 55433 763-783-2500

BELT SCALE SYSTEM

SCALE: 10-20-1 / INTEGRATOR: 9101

CUSTOMER:
END USER:
P.O. NO.:
FILE / C NO.:

- CONVEYOR DATA -

CONVEYOR NO.:
EQUIPMENT NO.:
PRODUCT:
CAPACITY: TPH
BELT SPEED: FPM
SPU PULLEY DIA.: INCH
BELT WIDTH: INCH
IDLER SPACE: INCH
TROUGH ANGLE: DEGREES

- - SCALE DATA - -

WEIGH SPAN: FEET
TARE LOAD: LBS
NET LOAD: LBS
GROSS LOAD: LBS
LOAD CELL :
BELT LOADING: LB/FT
SCALE CODE#:
PIVOT TO LC: INCH
WEIGH IDLER #:
PIVOT TO IDLER: INCH
NEXT: INCH

INSTRUMENT DATA

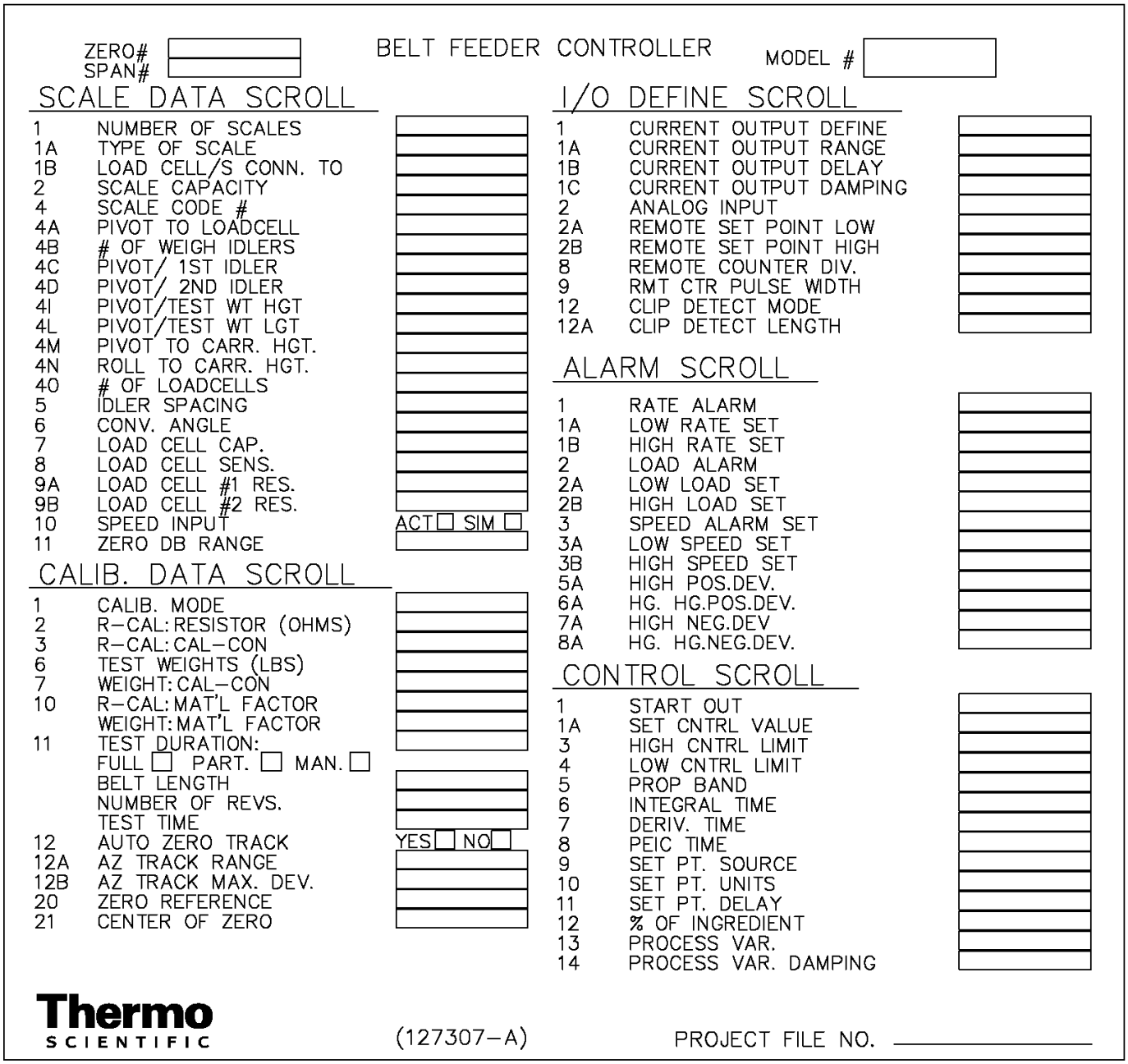
INTEGRATOR: **9101**
INTEGRATOR S/N: _____
PULSE OUTPUT: TONS
CURRENT OUTPUT: mA
OTHER:
R-CAL RESISTOR:
DIGITIZER:
DIGITIZER S/N:
SPEED SENSOR:

CALIBRATION DATA

LOAD CELL SENS.: mV/V
LOAD CELL #1: OHMS
- #1 S/N:
LOAD CELL #2: OHMS
- #2 S/N:
LOAD CELL #3: OHMS
- #3 S/N:
LOAD CELL #4: OHMS
- #4 S/N:

Door Label

Here is a copy of a typical Door Label for the Micro-Tech.



ZERO#
SPAN#

BELT FEEDER CONTROLLER

MODEL #

SCALE DATA SCROLL

1	NUMBER OF SCALES
1A	TYPE OF SCALE
1B	LOAD CELL/S CONN. TO
2	SCALE CAPACITY
4	SCALE CODE #
4A	PIVOT TO LOADCELL
4B	# OF WEIGH IDLERS
4C	PIVOT/ 1ST IDLER
4D	PIVOT/ 2ND IDLER
4I	PIVOT/TEST WT HGT
4L	PIVOT/TEST WT LGT
4M	PIVOT TO CARR. HGT.
4N	ROLL TO CARR. HGT.
4O	# OF LOADCELLS
5	IDLER SPACING
6	CONV. ANGLE
7	LOAD CELL CAP.
8	LOAD CELL SENS.
9A	LOAD CELL #1 RES.
9B	LOAD CELL #2 RES.
10	SPEED INPUT ACT☐ SIM ☐
11	ZERO DB RANGE

CALIB. DATA SCROLL

1	CALIB. MODE
2	R-CAL: RESISTOR (OHMS)
3	R-CAL: CAL-CON
6	TEST WEIGHTS (LBS)
7	WEIGHT: CAL-CON
10	R-CAL: MAT'L FACTOR
	WEIGHT: MAT'L FACTOR
11	TEST DURATION:
	FULL ☐ PART. ☐ MAN. ☐
	BELT LENGTH
	NUMBER OF REVS.
	TEST TIME
12	AUTO ZERO TRACK YES ☐ NO ☐
12A	AZ TRACK RANGE
12B	AZ TRACK MAX. DEV.
20	ZERO REFERENCE
21	CENTER OF ZERO

I/O DEFINE SCROLL

1	CURRENT OUTPUT DEFINE
1A	CURRENT OUTPUT RANGE
1B	CURRENT OUTPUT DELAY
1C	CURRENT OUTPUT DAMPING
2	ANALOG INPUT
2A	REMOTE SET POINT LOW
2B	REMOTE SET POINT HIGH
8	REMOTE COUNTER DIV.
9	RMT CTR PULSE WIDTH
12	CLIP DETECT MODE
12A	CLIP DETECT LENGTH

ALARM SCROLL

1	RATE ALARM
1A	LOW RATE SET
1B	HIGH RATE SET
2	LOAD ALARM
2A	LOW LOAD SET
2B	HIGH LOAD SET
3	SPEED ALARM SET
3A	LOW SPEED SET
3B	HIGH SPEED SET
5A	HIGH POS.DEV.
6A	HG. HG.POS.DEV.
7A	HIGH NEG.DEV
8A	HG. HG.NEG.DEV.

CONTROL SCROLL

1	START OUT
1A	SET CNTRL VALUE
3	HIGH CNTRL LIMIT
4	LOW CNTRL LIMIT
5	PROP BAND
6	INTEGRAL TIME
7	DERIV. TIME
8	PEIC TIME
9	SET PT. SOURCE
10	SET PT. UNITS
11	SET PT. DELAY
12	% OF INGREDIENT
13	PROCESS VAR.
14	PROCESS VAR. DAMPING

Thermo SCIENTIFIC

(127307-A)

PROJECT FILE NO. _____

Belt-Scale Codes

Here are the belt-scale codes for all Thermo Fisher Scientific scales (also known as "weigh-bridges") manufactured by Thermo Fisher Scientific as of May 2012.

Table A–1. List of Belt-Scale Codes

An explanation of the abbreviations used in the table's header (such as LA, LB, and so on, which relate to the conveyor measurements you made in the "Acquiring Basic System Data" section of the manual on page 2-5) are shown at the end of the table. Also listed at the end of the table are the units of measure for the numbers shown in the table below.

Belt Scale Code	Scale Model	Belt Width	Calibr. Kit	# Load Cells	# Idlers	LA	LB1	LB2	LB3	LB4	LB5	LB6	LC	LD	LE	LF	LG	mV/V
1	10-20-1	18-36	50-34	1	1	32	24	0	0	0	0	0	24	36	0	6.5	6.5	3
2	10-20-1	42-72	50-34	1	1	32	22.75	0	0	0	0	0	22.75	36	0	6.5	7	3
3	10-20-1	24-36	50-34	2	1	32	24	0	0	0	0	0	24	36	0	6.5	6.5	3
4	10-20-1	42-84	50-34	2	1	32	22.75	0	0	0	0	0	22.75	36	0	6.5	7	3
5	10-20-2		50-34	1	2	36	18	18	0	0	0	0	18	36	0	6.5	7	3
6	10-20-2		50-34	1	2	48	24	24	0	0	0	0	24	48	0	6.5	7	3
7	10-20-1	18-36	50-30	1	1	32	24	0	0	0	0	0	38	36	4.5	6.5	6.5	3
8	10-20-1	42-72	50-30	1	1	32	22.75	0	0	0	0	0	38	36	4.5	6.5	7	3
9	10-20-2LC	24-36	50-30	2	1	32	24	0	0	0	0	0	42.5	36	4.5	6.5	6.5	3
10	10-20-2LC	42-84	50-30	2	1	32	22.75	0	0	0	0	0	42.5	36	4.5	6.5	7	3
11	10-22	18-36	50-30	1	2	62	54	18	0	0	0	0	38	36	4.75	6.5	6.5	3
12	10-22	18-36	50-30	1	2	71	63	21	0	0	0	0	42	42	4.75	6.5	6.5	3
13	10-22	18-36	50-30	1	2	80	72	24	0	0	0	0	48	48	4.75	6.5	6.5	3
14	10-22	42-48	50-30	1	2	62	52.75	16.75	0	0	0	0	36	36	4.75	6.5	7	3
15	10-22	42-48	50-30	1	2	71	61.75	19.75	0	0	0	0	42	42	4.75	6.5	7	3
16	10-22	42-48	50-30	1	2	80	70.75	22.75	0	0	0	0	48	48	4.75	6.5	7	3
17	10-22	18-36	50-30	1	2	62	54	18	0	0	0	0	68	36	4.5	6.5	6.5	3
18	10-22	18-36	50-30	1	2	71	63	21	0	0	0	0	77	42	4.5	6.5	6.5	3
19	10-22	18-36	50-30	1	2	80	72	24	0	0	0	0	86	48	4.5	6.5	6.5	3
20	10-22	42-48	50-30	1	2	62	52.75	16.75	0	0	0	0	68	36	4.5	6.5	7	3
21	10-22	42-48	50-30	1	2	71	61.75	19.75	0	0	0	0	77	42	4.5	6.5	7	3
22	10-22	42-48	50-30	1	2	80	70.75	22.75	0	0	0	0	86	48	4.5	6.5	7	3
23	10-22	18-36	50-34	1	2	62	64	18	0	0	0	0	54	36	0	6.5	6.5	3
24	10-22	18-36	50-34	1	2	71	63	21	0	0	0	0	63	42	0	6.5	6.5	3
25	10-22	18-36	50-34	1	2	80	72	24	0	0	0	0	84	48	0	6.5	6.5	3
26	10-22	42-48	50-34	1	2	62	52.75	16.75	0	0	0	0	66	36	0	6.5	7	3
27	10-22	42-48	50-34	1	2	71	61.75	19.75	0	0	0	0	75	42	0	6.5	7	3
28	10-22	42-48	50-34	1	2	80	70.75	22.75	0	0	0	0	84	48	0	6.5	7	3
29	10-20-WF		BAR	1	1	32	24	0	0	0	0	0	24	30	-2	4	4	3
30	10-20-WF		BAR	1	1	32	22.75	0	0	0	0	0	22.75	30	-2	4	4	3
31	10-20-WF		BAR	1	1	32	24	0	0	0	0	0	36	30	2	4	4	3
32	10-20-WF		BAR	1	1	32	22.75	0	0	0	0	0	36	30	2	4	4	3
33	10-17-2		50-17	2	2	64	54	18	0	0	0	0	36	36	-4.75	6.5	7	3
34	10-17-2		50-17	2	2	76	63	21	0	0	0	0	42	42	-4.75	6.5	7	3

Belt Scale Code	Scale Model	Belt Width	Calibr. Kit	# Load Cells	# Idlers	LA	LB1	LB2	LB3	LB4	LB5	LB6	LC	LD	LE	LF	LG	mV/V
35	10-17-2		50-17	2	2	88	72	24	0	0	0	0	48	48	-4.75	6.5	7	3
36	10-17-2		50-17	2	2	76	63	23.62	0	0	0	0	43.31	39.37	-4.75	6.5	7	3
37	10-17-2		50-17	2	2	88	72	24.75	0	0	0	0	48.38	47.24	-4.75	6.5	7	3
38	10-17-4		50-17	2	4	64	54	18	54	18	0	0	36	36	0	0	0	3
39	10-17-4		50-17	2	4	76	63	21	63	21	0	0	42	42	0	0	0	3
40	10-17-4		50-17	2	4	88	72	24	72	24	0	0	48	48	0	0	0	3
41	10-17-4		50-17	2	4	66	63	23.62	63	23.62	0	0	43.31	39.37	0	0	0	3
42	10-17-4		50-17	2	4	88	72	24.75	72	24.75	0	0	48.31	47.24	0	0	0	3
43	10-14-3		50-14	4	3	0	0	0	0	0	0	0	0	36	0	0	0	3
44	10-14-3		50-14	4	3	0	0	0	0	0	0	0	0	42	0	0	0	3
45	10-14-3		50-14	4	3	0	0	0	0	0	0	0	0	48	0	0	0	3
46																		
47	10-14-4		50-14	4	4	0	0	0	0	0	0	0	0	36	0	0	0	3
48	10-14-4		50-14	4	4	0	0	0	0	0	0	0	0	42	0	0	0	3
49	10-14-4		50-14	4	4	0	0	0	0	0	0	0	0	48	0	0	0	3
50	10-14-4		50-14	4	4	0	0	0	0	0	0	0	0	54	0	0	0	3
51	10-14-4		50-14	4	4	0	0	0	0	0	0	0	0	39.37	0	0	0	3
52	10-14-4		50-14	4	4	0	0	0	0	0	0	0	0	47.24	0	0	0	3
53	10-30		50-30	1	1	0	0	0	0	0	0	0	0	36	0	0	0	1.8
54	10-11	18-42	WTS	1	1	55.50	48	0	0	0	0	0	40	36	6.5	6.5	6.5	3
55	10-11	48-72	WTS	1	1	56.50	48	0	0	0	0	0	40	36	7	7	7	3
56	10-12		WTS	1	2	66	48	48	0	0	0	0	40	36	7	7	7	3
57	10-17-2D		50-17	2	2	40	24	24	0	0	0	0	24	48	0	6.5	7	3
58	10-17-2D		50-17	2	2	34	21	21	0	0	0	0	21	42	0	6.5	7	3
59	10-17-2D		50-17	2	2	28	18	18	0	0	0	0	18	36	0	6.5	7	3
60																		
101				1	1	32	24	0	0	0	0	0	40	36	-4.5	6.5	7	3
102				1	2	68	24	60	0	0	0	0	76	36	-4.5	6.5	7	3
103				1	1	32	24	0	0	0	0	0	24	36	1.5	3.5	4.3	3
104																		
105				1	2	56	18	48	0	0	0	0	64	30	-4.5	6.5	7	3
106				1	2	68	24	60	0	0	0	0	76	36	-4.5	6.5	7	3
107				1	2	74	24	66	0	0	0	0	82	42	-4.5	6.5	7	3
108				1	2	80	24	72	0	0	0	0	88	48	-4.5	6.5	7	3
109																		
110				1	2	70.87	23.62	62.99	0	0	0	0	78.74	39.37	-4.5	6.5	7	3
111				1	2	78.74	23.62	70.87	0	0	0	0	86.61	47.24	-4.5	6.5	7	3
112				1	2	90.55	23.62	82.68	0	0	0	0	98.43	59.06	-4.5	6.5	7	3
113																		
114				2	2	60.5	16.5	49.5	0	0	0	0	71.5	33	-4.5	6.5	7	3
115				2	2	66	18	54	0	0	0	0	78	36	-4.5	6.5	7	3
116				2	2	73.31	20	60	0	0	0	0	86.62	40	-4.5	6.5	7	3
117				2	2	77	21	63	0	0	0	0	91	42	-4.5	6.5	7	3
118				2	2	88	24	72	0	0	0	0	104	48	-4.5	6.5	7	3
119				2	2	99	27	81	0	0	0	0	117	54	-4.5	6.5	7	3

Belt Scale Code	Scale Model	Belt Width	Calibr. Kit	# Load Cells	# Idlers	LA	LB1	LB2	LB3	LB4	LB5	LB6	LC	LD	LE	LF	LG	mV/V
120				2	2	110	30	90	0	0	0	0	130	60	-4.5	6.5	7	3
121																		
122																		
123				2	2	72.17	19.69	59.06	0	0	0	0	85.28	39.37	-4.5	6.5	7	3
124				2	2	86.61	23.62	70.87	0	0	0	0	102.36	47.24	-4.5	6.5	7	3
125																		
126																		
127																		
128																		
129																		
130				2	4	58.12	16.5	49.5	16.5	49.5	0	0	58.12	33	-4.5	6.5	7	3
131				2	4	64.12	18	54	18	54	0	0	64.12	36	-4.5	6.5	7	3
132				2	4	72.12	20	60	20	60	0	0	72.12	40	-4.5	6.5	7	3
133				2	4	76.12	21	63	21	63	0	0	76.12	42	-4.5	6.5	7	3
134				2	4	88.12	24	72	24	72	0	0	88.12	48	-4.5	6.5	7	3
135				2	4	100.12	27	81	27	81	0	0	100.1	54	-4.5	6.5	7	3
136				2	4	112.12	30	90	30	90	0	0	112.1	60	-4.5	6.5	7	3
137																		
138																		
139				2	4	70.87	19.69	59.06	19.69	59.06	0	0	70.87	39.37	-4.5	6.5	7	3
140				2	4	86.61	23.62	70.87	23.62	70.87	0	0	86.61	47.24	-4.5	6.5	7	3
201				1	1	31.89	24.02	0	0	0	0	0	24.02	39.37	-16.81	6.38	4.92	3
202				1	1	31.89	24.02	0	0	0	0	0	24.02	39.37	-16.81	4.41	4.92	3
203				1	1	31.89	24.02	0	0	0	0	0	24.02	19.69	-16.81	6.38	4.92	3
204				1	1	31.89	24.02	0	0	0	0	0	24.02	19.69	-16.81	4.41	4.92	3
205				2	1	31.89	24.02	0	0	0	0	0	24.02	39.37	-16.81	6.38	4.92	3
206				2	1	31.89	24.02	0	0	0	0	0	24.02	39.37	-16.81	4.41	4.92	3
207				1	2	31.89	24.02	24.02	0	0	0	0	24.02	39.37	-16.81	6.38	4.92	3
208				2	2	31.89	24.02	24.02	0	0	0	0	24.02	39.37	-16.81	6.38	4.92	3
209				1	1	0	0	0	0	0	0	0	0	39.37	0	0	0	2
210				1	1	0	0	0	0	0	0	0	0	23.62	0	0	0	2
211				2	1	0	0	0	0	0	0	0	0	47.24	0	0	0	2
212				4	4	0	0	0	0	0	0	0	0	39.37	0	0	0	2
213				4	3	0	0	0	0	0	0	0	0	39.37	0	0	0	2
214	10-101R-1		50-30	1	1	0	0	0	0	0	0	0	0	39.37	0	0	0	2
215	10-101R-2		50-30	2	1	0	0	0	0	0	0	0	0	39.37	0	0	0	2
301				1	1	39.37	31.50	0	0	0	0	0	25.59	39.37	-6.42	5.43	5.31	3
302				1	1	39.37	31.50	0	0	0	0	0	25.59	47.24	-6.42	5.43	5.31	3
303				1	1	39.37	31.50	0	0	0	0	0	25.59	39.37	-8.39	7.40	6.30	3

Belt Scale Code	Scale Model	Belt Width	Calibr. Kit	# Load Cells	# Idlers	LA	LB1	LB2	LB3	LB4	LB5	LB6	LC	LD	LE	LF	LG	mV/V
304				1	1	39.37	31.50	0	0	0	0	0	25.59	47.24	-8.39	7.40	6.30	3
305				2	1	39.37	31.50	0	0	0	0	0	25.59	39.37	-8.39	7.40	7.72	3
306				2	1	39.37	31.50	0	0	0	0	0	25.59	47.24	-8.39	7.40	7.72	3
307				1	2	39.37	31.50	31.50	0	0	0	0	46.46	39.37	0	0	0	3
308				1	2	39.37	31.50	31.50	0	0	0	0	46.46	47.24	0	0	0	3
309				1	2	39.37	31.50	31.50	0	0	0	0	46.46	39.37	0	0	0	3
310				1	2	39.37	31.50	31.50	0	0	0	0	46.46	47.24	0	0	0	3
311				2	2	39.37	31.50	31.50	0	0	0	0	46.46	39.37	0	0	0	3
312				2	2	39.37	31.50	31.50	0	0	0	0	46.46	47.24	0	0	0	3
313				4	4	0	0	0	0	0	0	0	0	39.37	0	0	0	3
314				1	1	0	0	0	0	0	0	0	0	39.37	0	0	0	2
315				2	1	0	0	0	0	0	0	0	0	39.37	0	0	0	2
401				1	2	49.21	29.53	68.90	0	0	0	0	49.21	39.37	4.06	4.17	4.72	3
402				2	2	49.21	29.53	68.90	0	0	0	0	49.21	39.37	4.06	4.17	4.72	3
403				1	1	39.37	29.53	29.53	0	0	0	0	29.53	39.37	4.06	4.17	4.72	3
404																		
405				2	1	0	0	0	0	0	0	0	0	39.37	0	0	0	2
406				4	2	0	0	0	0	0	0	0	0	39.37	0	0	0	3
407				4	3	0	0	0	0	0	0	0	0	47.24	0	0	0	3
408				4	4	0	0	0	0	0	0	0	0	39.37	0	0	0	3
409				4	6	0	0	0	0	0	0	0	0	39.37	0	0	0	3
410				1	1	0	0	0	0	0	0	0	0	39.37	0	0	0	2
501				1	1	31.50	23.62	0	0	0	0	0	23.62	39.37	0	0	0	3
502				1	1	31.50	22.64	0	0	0	0	0	22.64	39.37	0	0	0	3
503				1	2	43.31	23.62	23.62	0	0	0	0	23.62	39.37	0	0	0	3
504				2	4	70.87	19.69	59.06	19.69	59.06	0	0	0	39.37	0	0	0	3
505				4	4	0	0	0	0	0	0	0	0	39.37	0	0	0	3
601				1	1	0	0	0	0	0	0	0	0	39.37	0	0	0	2
602				1	1	31.89	24.02	0	0	0	0	0	24.02	39.37	0	0	0	3
603				2	1	31.89	24.02	0	0	0	0	0	24.02	39.37	0	0	0	3
604				1	1	23.62	17.72	0	0	0	0	0	17.72	39.37	0	0	0	3
605				1	2	39.37	19.69	19.69	0	0	0	0	19.69	39.37	0	0	0	3
606				2	2	39.37	19.69	19.69	0	0	0	0	19.69	39.37	0	0	0	3
607				1	2	39.37	19.69	19.69	0	0	0	0	19.69	39.37	0	0	0	3
608				2	4	66.93	59.06	19.69	59.06	19.69	0	0	72.83	39.37	0	0	0	3
609				4	4	0	0	0	0	0	0	0	0	39.37	0	0	0	3
610				4	5	0	0	0	0	0	0	0	0	39.37	0	0	0	3
611				4	6	0	0	0	0	0	0	0	0	39.37	0	0	0	3

See next page for additional information

List of Abbreviations and Units of Measure Used in the Table

Abbreviation	Explanation	Unit of Measure	For more information, see the following figures
Belt width	—	inches	—
LA	Pivot-to-load-cell distance	inches	Figure 2–1
LB	Pivot-to-*n*-idler distance (where *n* = 1st, 2nd, 3rd, ...n idler)	inches	Figure 2–3
LC	Pivot-to-test-weight length	inches	Figure 2–5
LD	Idler spacing	inches	Figure 2–8
LE	Pivot-to-test-weight height	inches	Figure 2–4
LF	Pivot-to-carriage height	inches	Figure 2–6
LG	Roller-to-stringer height	inches	Figure 2–7
mV/V	Load-cell sensitivity	millivolts/volt	Figure 2–10

Establishing Belt-Length-Test Duration

This procedure calibrates the belt to the system and establishes a test duration for all the simulated calibrations. A test duration can be acquired or entered manually. Acquiring a test duration is described below. Manual entry of the test duration is described on page 2-37.

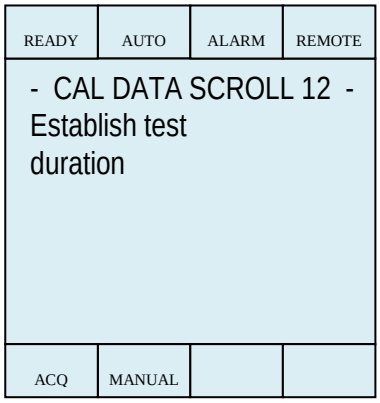
Acquire Test Duration

There are two methods to acquire the test duration—the Full and Partial methods. The Partial (belt-length measurement) method allows you to acquire the test duration without measuring the entire length of the belt. This method, however, should *only* be used when the belt length exceeds 1,000 feet. In addition, using the Partial method may be less accurate than using the Full method. Zero and span calibrations are the most accurate when using complete passes of the belt.

Partial Belt-Length Method

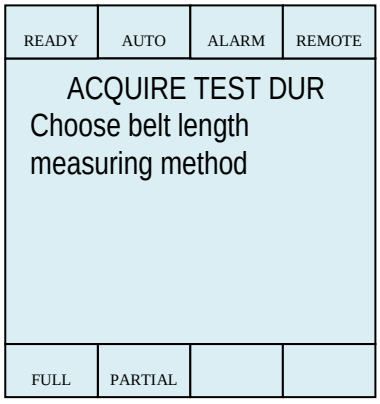
The partial belt-length method should *only* be used if the belt is longer than 1,000 feet.

Pressing the Abort button at anytime returns you to the “Cal Data Scroll 12” screen shown below.



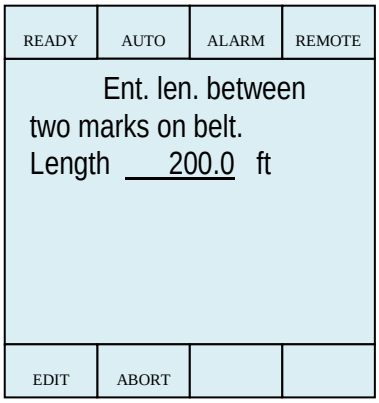
To use the partial belt-length method, do the following.

1. Press the Acquire button and the following screen appears.



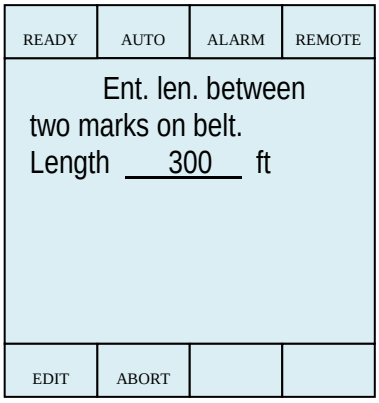
2. Mark and measure a section of the belt. The section you mark must be longer than 200 feet.

3. Press the Partial button and the following screen appears.

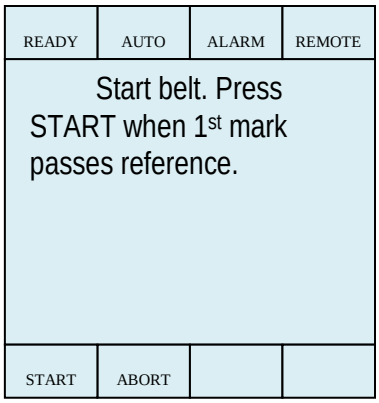


4. Press the Edit button and use the keypad to enter the actual length of the section you marked. (The default value is 200 feet.)

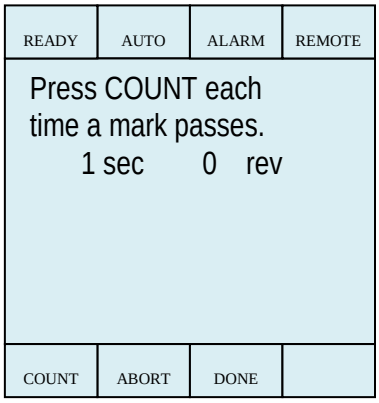
5. Press the Enter button. (We entered 300 feet.)



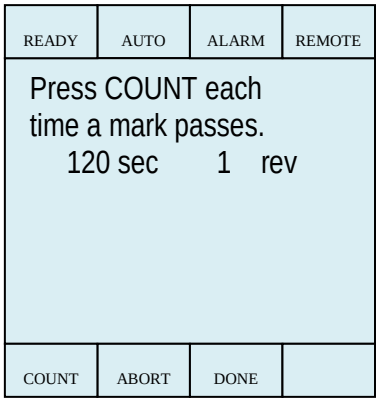
6. Press the Start button.



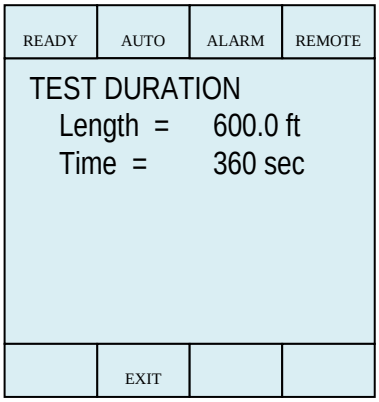
7. Press the Count button each time a reference mark passes.



8. Continue to press the Count button when a mark passes, until the following two conditions are met.
   - The belt has made at least *three* complete revolutions.
   - The total running time of the test exceeds *six* minutes.

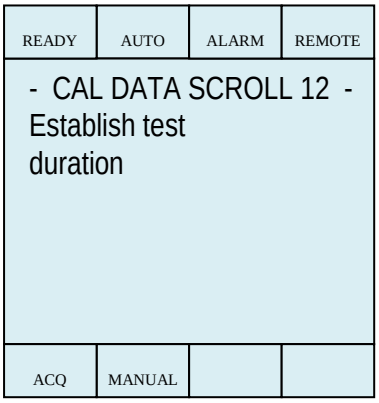


9. After the last revolution has been counted, press the Done button.



Full Belt-Length Method

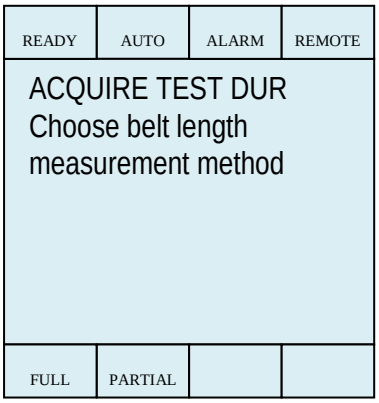
Use this method for belts that are shorter than 1,000 feet. In addition, note that pressing the Abort button at anytime returns you to the "Cal Data Scroll 12" screen shown below.



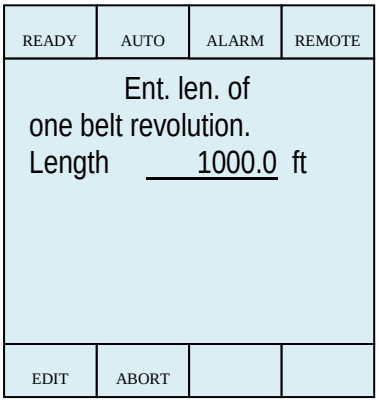
To use the full belt-length method, do the following.

1. Make a chalk mark on the belt.

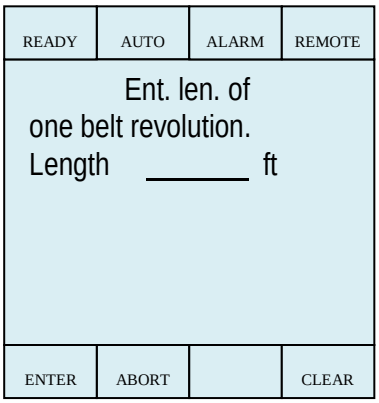
2. Press the Acquire button and the following screen appears.



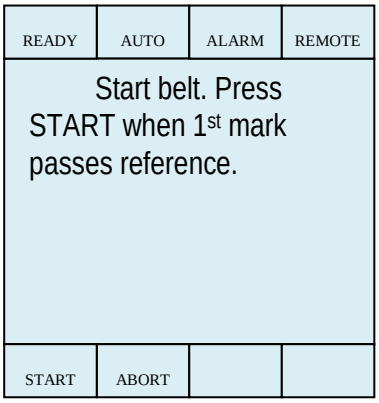
3. Press the Full button.



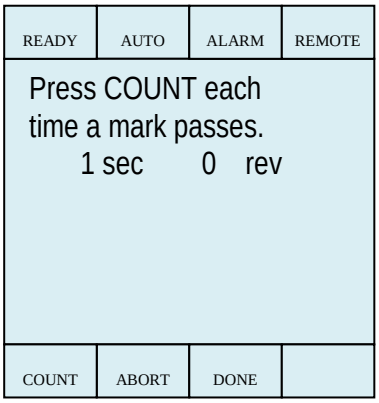
4. Press the Edit button and use the keypad to enter the entire length of the belt. Then press the Enter button.



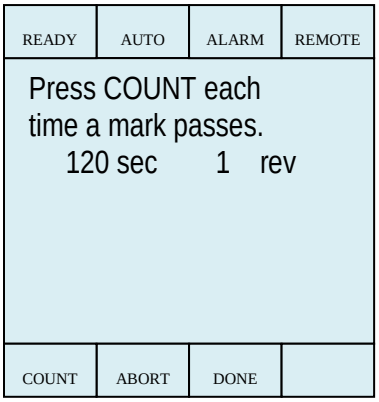
5. Press the Start button.



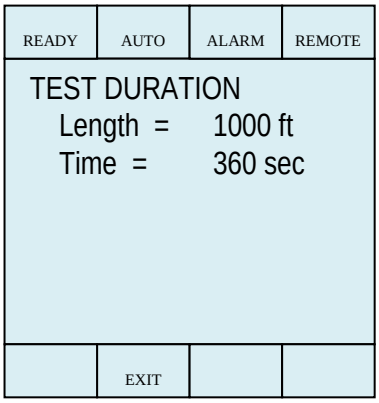
6. Press the Count button each time the reference mark passes.



7. Continue to press the Count button when the mark passes, until the following two conditions are met.
   - The belt has made at least *three* complete revolutions.
   - The total running time of the test exceeds *six* minutes.



8. After the last revolution is counted, press the Done button.



Material Factoring

When the possibility exists that multiple calibration methods are available, one must be selected to achieve a span number. All other calibration methods should be material factored to the proven span number.

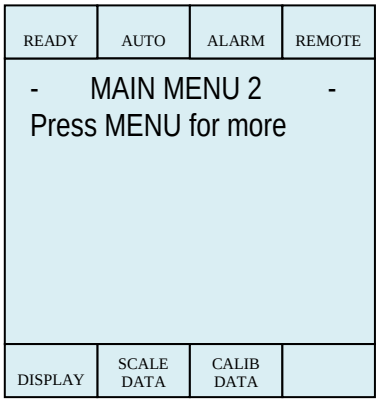
Calibration Method	Availability
R-Cal	Built-in
Static weights	Optional item
Test chain	Optional item
Other	Material Factoring—pre- or post-weighed material. (User supplied.)

Since all Micro-Tech models are equipped with R-Cal, this example will assume an R-Cal span #. It then will factor the static weights to the R-Cal span number. Other factoring is similar and not shown.

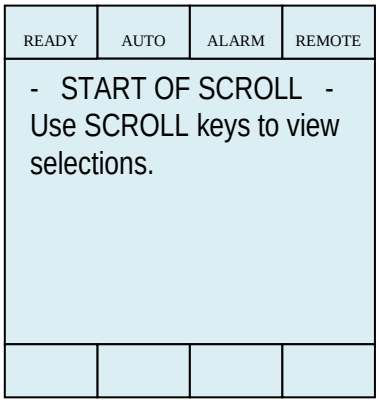
Reset Weight Factor

To reset the existing weight material factor, do the following.

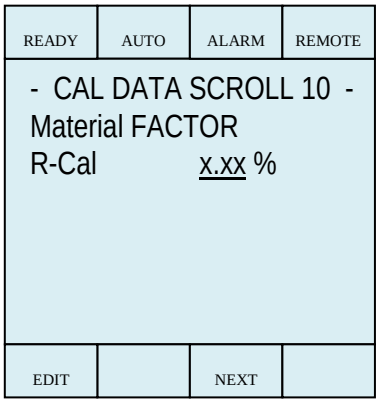
1. Press the Menu button twice to bring up “Main Menu 2.”



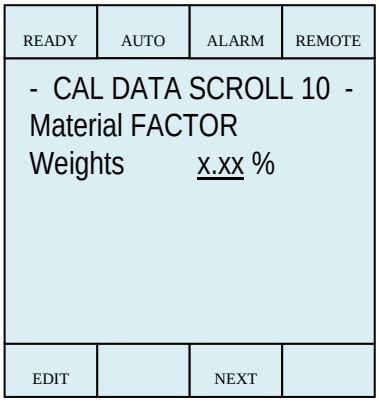
2. Press the Calibration Data button and the following screen appears.



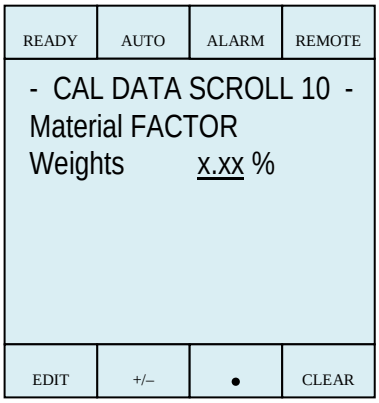
3. Press the down-arrow button repeatedly until the “Cal Data Scroll 10” screen appears.



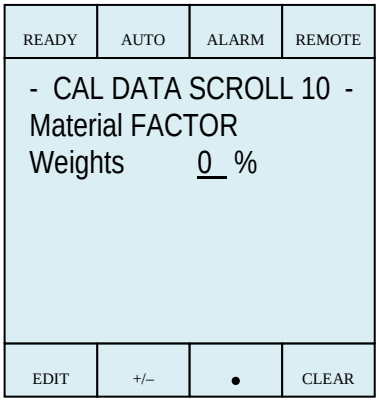
4. Press the Next button and the Weights screen appears.



5. Press the Edit button.



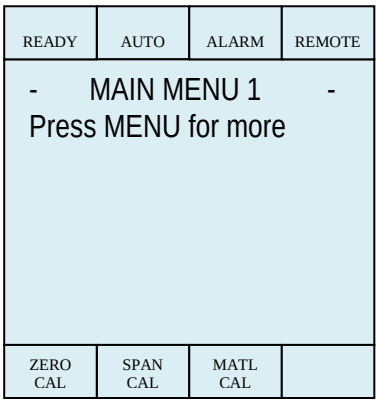
6. Use the keypad to enter a zero value (0) for Weights. Then press the Enter button. Your screen will now look like this.



Static Weight

The auto-span procedure determines the percent static-weight span-error.

1. Press the Menu button to bring up the “Main Menu 1” screen.



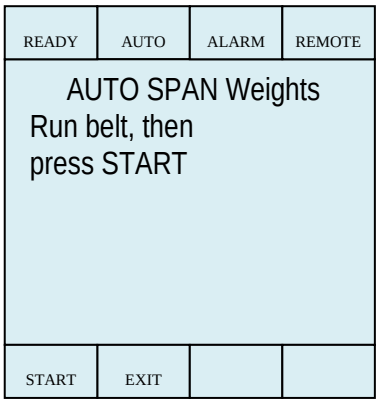
2. Press Span button and the following screen appears.

Auto Span

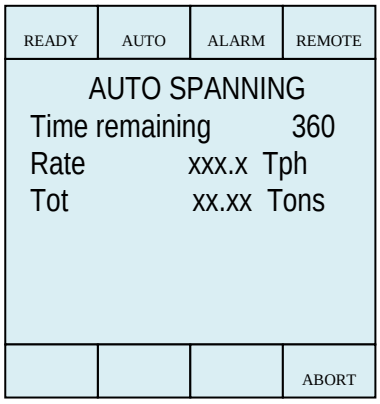
The auto-span procedure determines the percent of scale weight span error.

1. Add your test weight to the conveyor.

2. Press the Start button and the following screen appears.



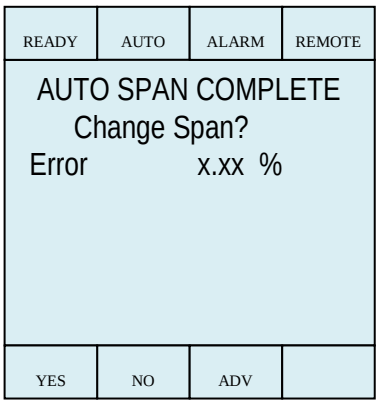
3. Make sure the belt is running empty, then press the Start button. The following Auto Spanning screen appears.



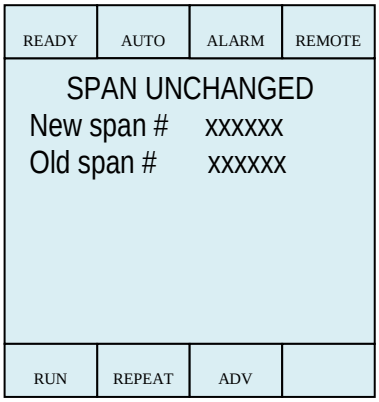
4. When the Auto Span procedure is completed, the span percent-error is displayed.

Record Results

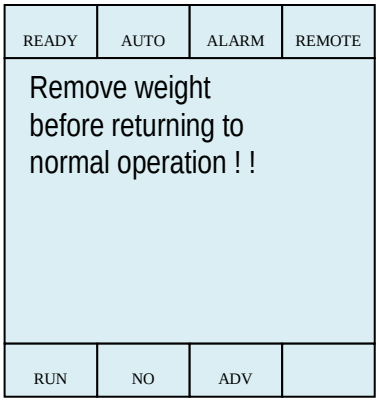
Record the results and note whether the error is positive or negative.



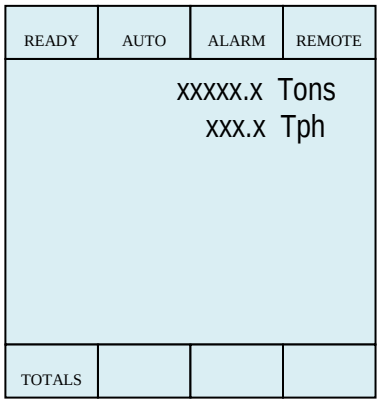
1. Press the No button (meaning you *do not* want to change the span), and the following screen appears.



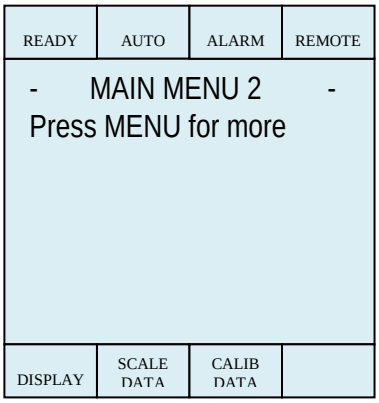
2. Press the Run button and the following screen appears.



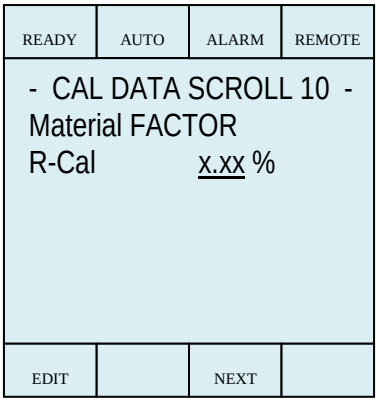
3. Press the Run button and the Micro-Tech Run screen reappears, as shown below.



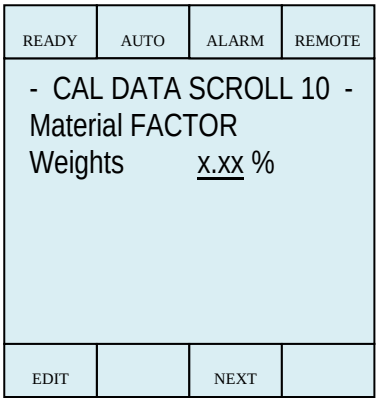
4. Press the Menu button twice to bring up the “Main Menu 2” screen.



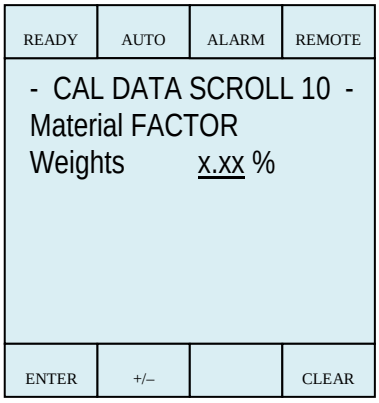
5. Press the down-arrow button and the Material Factor screen appears.



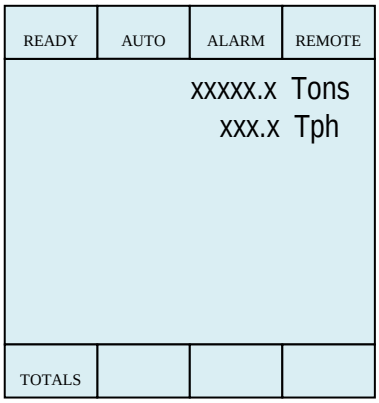
6. Press the Next button and the Weights screen appears.



7. Press the Edit button and use the keypad to enter the weight error. Then press the Edit button. The error you entered is displayed in the screen below.



8. Press the Run button and the Micro-Tech Run screen reappears, as shown below.



Motherboard Terminal Block Definitions

The terminal-block definitions for the motherboard are shown below.

J16	J21	J45	J37	J29
1 2 3 4 5 6 7	11 12 13 14 15 16 17	21 22 23 24 25 26	31 32 33 34 35 36 37 38	41 42 43 44 45 46 47 48
LOADCELL 1	LOADCELL 2	COMM B	COMM A	SPU and PULSE OUT

J16	Load Cell 1
1	SHIELD (EARTH)
2	+ EXCITATION
3	– EXCITATION
4	+ SENSE
5	– SENSE
6	+ SIGNAL
7	– SIGNAL

J21	Load Cell 2
11	SHIELD (EARTH)
12	+ EXCITATION
13	– EXCITATION
14	+ SENSE
15	– SENSE
16	+ SIGNAL
17	– SIGNAL

J45	COMM B (Non-isolated RS-485)
21	RS-485 Z TX -
22	RS-485 Y TX +
23	RS-485 A RX +
24	RS-485 B RX -
25	COMMON
26	SHIELD (EARTH)

J37	COMM A (Isolated RS-485/232)
31	RTS/-485 OUT
32	TXD/+485 OUT
33	RXD
34	+485 IN
35	–485 IN
36	CTS/DCO
37	UART GND (ISOLATED)
38	SHIELD (EARTH)

J29	Speed signal (SPU) input and Output #5
41	+24VDC
42	SIGNAL 1 (SPU)
43	COMMON
44	SHEILD (EARTH)
45	SIGNAL 2 (SPU)
46	24VDC POWER
47	OUTPUT #5 (24V) (OPEN-DRAIN)
48	COMMON

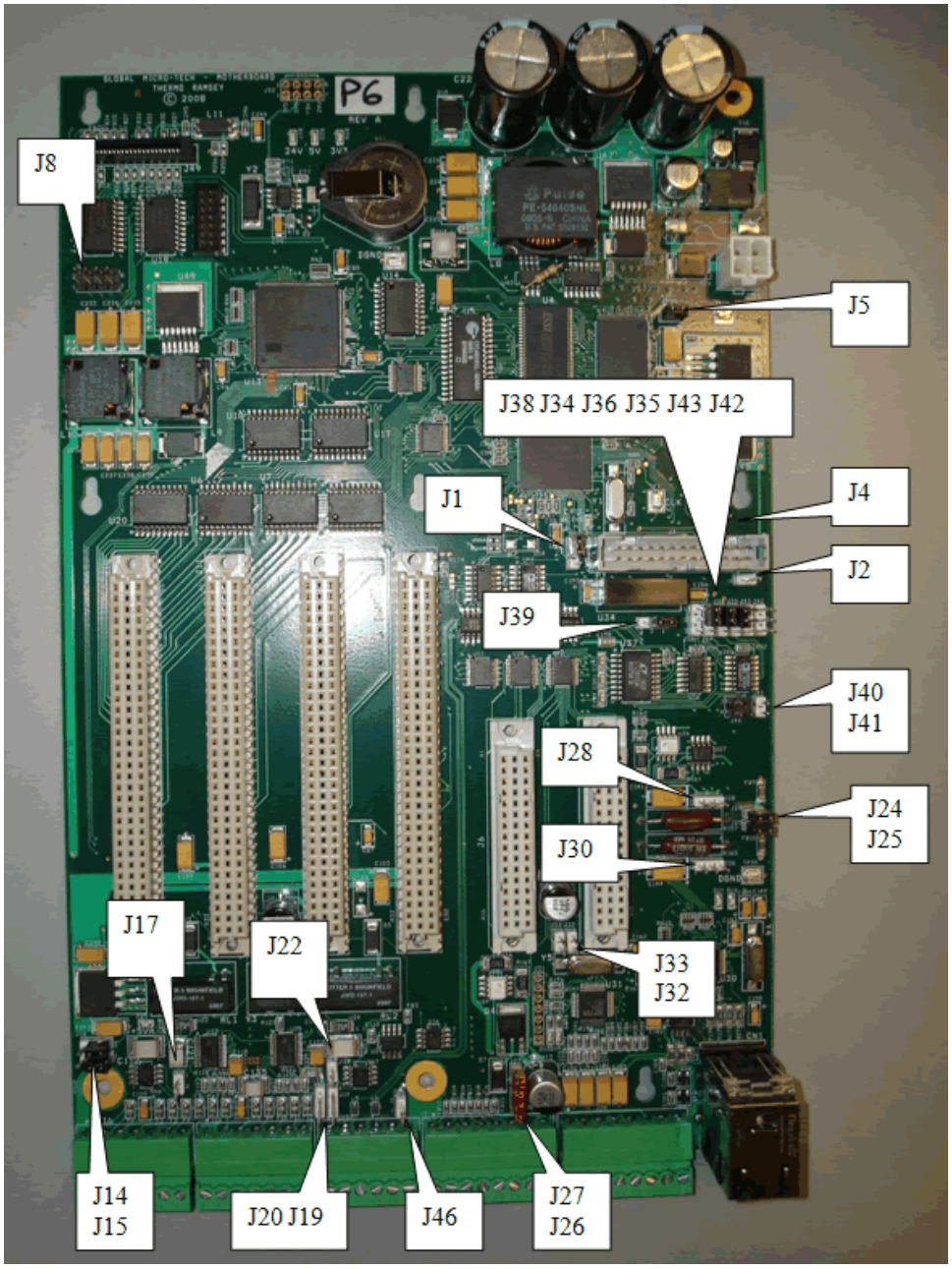
Premium A/D Terminal Block Definitions

The terminal block definitions for the Premium A/D Board are shown below. (Model 9205 Micro-Tech only.)

J9	Premium A/D Load Cell
1	Shield (Earth GND)
2	Signal COM
3	+ Excitation (+5v)
4	- Excitation (-5v)
5	+ Excitation Sense
6	- Excitation Sense
7	+ Load Cell Signal
8	- Load Cell Signal

Motherboard Jumper Locations

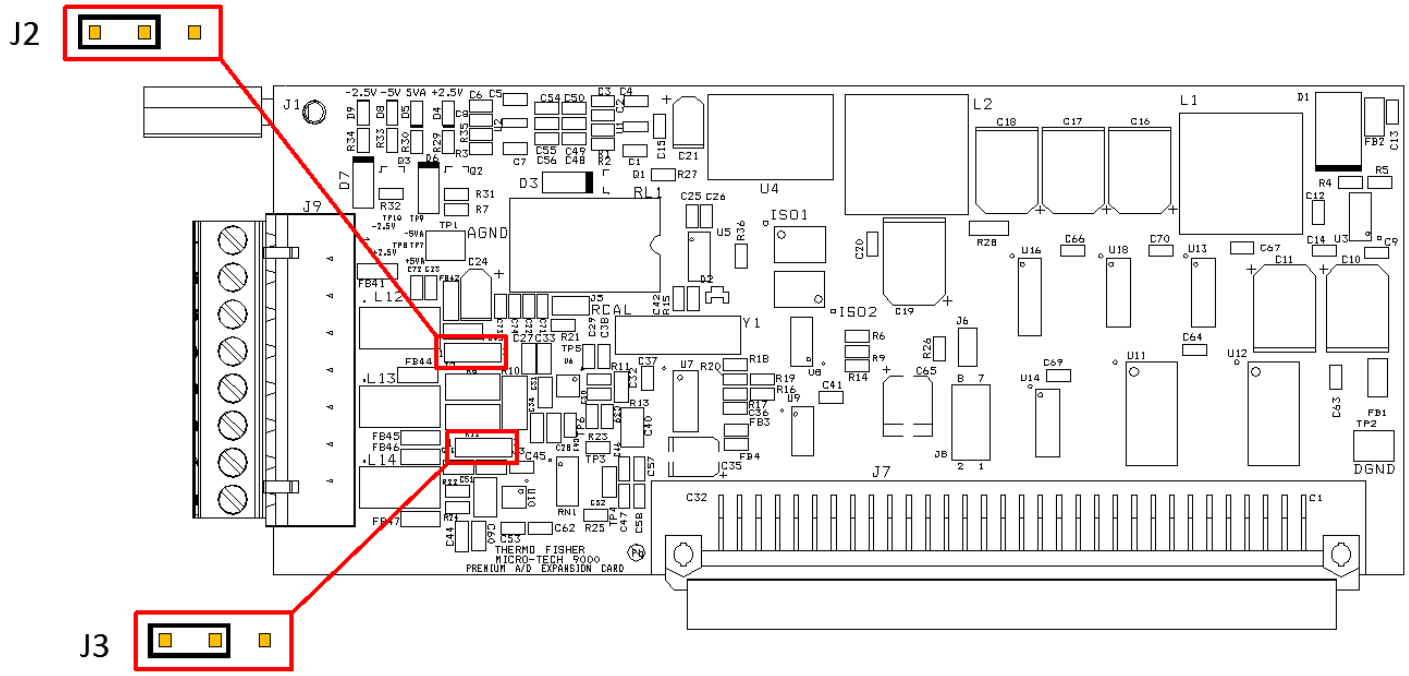
Here are the jumper locations the Micro-Tech motherboard.



Premium A/D Jumper Locations

Here are the Load Cell jumper locations of the Premium A/D board (Model 9205 Micro-Tech only.)

Position 1-2 shown
(no sense leads)



Position 1-2 shown
(no sense leads)

Motherboard Jumper Settings

Here are the jumper settings for the Micro-Tech Motherboard.

Load-Cell Interrupt Selection Jumper

Jumper	Jumper Settings	Default
J8	Jumper Setting: Pins 1-2 — Load Cell IRQ 1 Pins 3-4 — Load Cell IRQ 2 Pins 5-6 — Load Cell IRQ 3 Pins 7-8 — Load Cell IRQ 4	J8 Not Installed

Load-Cell Sense Selection Jumpers

Jumper	Jumper Settings	Default
J14 J15	Jumper Setting: Pins 1-2 — Local Sense Channel 1 Pins 2-3 — Remote Sense Channel 1 Not Installed — Remote Sense Channel 1	J14 1-2 Installed J15 1-2 Installed
J17	Optional R-CAL resistor Channel 1	Not Installed
J19 J20	Jumper Setting: Pins 1-2 — Local Sense Channel 2 Pins 2-3 — Remote Sense Channel 2 Not Installed — Remote Sense Channel 2	J19 1-2 Installed J20 1-2 Installed
J22	Optional R-CAL resistor Channel 2	J22 Not Installed

Speed-Input and Output #5 Jumpers

<table>
<tr><th>Jumper</th><th>Jumper Settings</th><th>Default</th></tr>
<tr><td>J24
J25</td><td>Speed input 1<table><tr><td>Jumper Setting</td><td>Description</td></tr><tr><td>Installed</td><td>Local 24V Power</td></tr><tr><td>Not Installed</td><td>Remote Power</td></tr></table></td><td>J24 Installed
J25 Installed</td></tr>
<tr><td>J26
J27</td><td>Speed input 2 & Output #5<table><tr><td>Jumper Setting</td><td>Description</td></tr><tr><td>Installed</td><td>Local 24V Power</td></tr><tr><td>Not Installed</td><td>Remote Power</td></tr></table></td><td>J26 Installed
J27 Installed</td></tr>
<tr><td>J28
J30</td><td>J28 Speed input 1 cutoff, J30 Speed input 2 cutoff<table><tr><td>Jumper Setting</td><td>Description</td></tr><tr><td>Pins 1-2</td><td>Speed Input Cut-off 13kHz</td></tr><tr><td>Pins 2-3</td><td>Speed Input Cut-off 425 Hz</td></tr><tr><td>Not Installed</td><td>Speed Input Cut-off 13kHz</td></tr></table></td><td>J28 Installed 1-2
J30 Installed 1-2</td></tr>
</table>

UART Configuration Jumpers

<table>
<tr><th>Jumper</th><th>Jumper Settings</th><th>Default</th></tr>
<tr><td>J34</td><td>COMM A, (UART 0)<table><tr><td>Jumper Setting</td><td>Description</td></tr><tr><td>Pins 1-2</td><td>RS-485 Normal Operation</td></tr><tr><td>Pins 2-3</td><td>RS-485 Multi-Drop Operation</td></tr></table></td><td>J34 Installed 1-2</td></tr>
<tr><td>J35
J36
J39</td><td>COMM A, (UART 0)<table><tr><td>Jumper Setting</td><td>Description</td></tr><tr><td>Pins 1-2</td><td>RS-232 Mode</td></tr><tr><td>Pins 2-3</td><td>RS-485 Mode</td></tr><tr><td>Not Installed</td><td>RS-232 Mode</td></tr></table></td><td>J35 Installed Pins 1-2
J36 Installed Pins 1-2
J39 Installed Pins 1-2</td></tr>
<tr><td>J38</td><td>COMM A, (UART 0)<table><tr><td>Jumper Setting</td><td>Description</td></tr><tr><td>Pins 1-2</td><td>RS-485 Receive → U0RXD</td></tr><tr><td>Pins 2-3</td><td>RS-485 Receive → U0CTS</td></tr></table></td><td>J38 Installed 1-2</td></tr>
</table>

<table>
<tr>
<td>J40</td>
<td>COMM A Termination, (UART 0)
<table>
<tr><td>Jumper Setting</td><td>Description</td></tr>
<tr><td>Pins 1-2</td><td>Enable RS-485 Termination</td></tr>
<tr><td>Pins 3-4</td><td>Disable RS-485 Termination</td></tr>
<tr><td>Not Installed</td><td>Disable RS-485 Termination</td></tr>
</table></td>
<td>J40 Installed 3-4</td>
</tr>
<tr>
<td>J41</td>
<td>COMM A Termination, (UART 0)
<table>
<tr><td>Jumper Setting</td><td>Description</td></tr>
<tr><td>Pins1-2</td><td>Enable RS-485 Termination</td></tr>
</table></td>
<td>J41 Installed</td>
</tr>
<tr>
<td>J42
J43</td>
<td>COMM A Termination, (UART 0)
<table>
<tr><td>Jumper Setting</td><td>Description</td></tr>
<tr><td>Pins1-2</td><td>1.2kΩ termination enable</td></tr>
<tr><td>Pins 2-3</td><td>600Ω Bias Enabled</td></tr>
<tr><td>Not Installed</td><td>No additional termination</td></tr>
</table></td>
<td>J42 Installed 1-2
J43 Installed 1-2</td>
</tr>
</table>

UART Configuration Jumpers (continued)

<table>
<tr><th>Jumper</th><th>Jumper Settings</th><th>Default</th></tr>
<tr>
<td>J46</td>
<td>COMM B Termination, (UART 2)
<table>
<tr><td>Jumper Setting</td><td>Description</td></tr>
<tr><td>Installed</td><td>120Ω term□nation</td></tr>
</table></td>
<td>J46 Not Installed</td>
</tr>
</table>

Premium A/D Jumper Settings

Here are the jumper settings for the Premium A/D board. (Model 9205 Micro-Tech only.)

Premium A/D Board Load-Cell Excitation Sense

Jumper	Jumper Settings		Default
J2 J3			J2 1-2 Installed J3 1-2 Installed
	Jumper Setting	Description	
	Pins 1-2	Local sensing (4-wire LC)	
	Pins 2-3	Remote sensing (6-wire LC)	
	Not Installed	Remote sensing (6-wire LC)	

A/D Jumpers—Load-Cell Sense

Load-cell sense is controlled by selectable jumpers (J14 and J15 for channel 1, and J19 and J20 for channel 2) located on the motherboard and by jumpers (J2 and J3) on the Premium A/D Board. The jumpers should be in position “1-2” local sense, if the distance is less than 200 feet between the load cell and the Micro-Tech. For distances greater than 200 feet and less than 3,000 feet, the jumper should be in position “2-3” and a special 6-wire cable is required. Refer to the field wiring diagram that is appended to this manual, for jumper requirement in the scale junction box.

Load-Cell Specifications

Table A–2. Motherboard Load-Cell Technical Specifications (Model 9105)

Load Cell Excitation Power Supply	5 VDC ±10%, 90 mA, minimum load impedance (58 ohms). Output short circuit, 0.5 A maximum.
Load Cell Load cell input circuits (2 each)	Number: Up to six (6) 350-ohm load cells in parallel. Cable distance: 200ft [61m] or less without sense, or 3000ft [914m] with sense. Sensitivity: 0.5mV/V to 3.5 mV/V (keypad selectable). Input Impedance: 1M-ohm minimum. Maximum Usable Signal: 114% of 3mV/V. Internal A/D counts: (3mV/V): 6,440,000. Isolation: Non-isolated. Max non-destructive input voltage: ± 6 V relative to ground. Load Cell Cable Shield: Connected to earth ground.
Load Cell Excitation-Sense Circuitry (2 each)	4 wire system: cable distance not exceed 200ft [61m]. 6 wire system: cable distance not to exceed 3000ft [914m]. Nominal input voltage: 5 VDC. Input impedance: 100 k-ohm minimum. Jumper selectable: Local or remote sense.

Table A–3. Premium A/D Board Load-Cell Technical Specifications (Model 9205)

Load Cell Excitation Power Supply	±5 VDC ±5%, 180 mA, minimum load impedance (58 ohms). Output short circuit, 0.5 A maximum.
Load Cell Load cell input circuit	Number: Up to six (6) 350-ohm load cells in parallel. Cable distance: 200ft [61m] or less without sense, or 3000ft [914m] with sense. Sensitivity: 0.5mV/V to 3.5 mV/V (keypad selectable). Input Impedance: 1M-ohm minimum. Maximum Usable Signal: 114% of 3mV/V. Internal A/D counts: (3mV/V): 7,341,000. Isolation: Non-isolated. Max non-destructive input voltage: ± 6 V relative to ground. Load Cell Cable Shield: Connected to earth ground.
Load Cell Excitation-Sense Circuitry	4 wire system: cable distance not exceed 200ft [61m]. 6 wire system: cable distance not to exceed 3000ft [914m]. Nominal input voltage: ±5 VDC. Input impedance: 100 k-ohm minimum. Jumper selectable: Local or remote sense.

Speed Sensor Specifications

Table A–4. Speed Sensor Specifications

Minimum required for scale use	1000 pulse/minute at nominal belt speed.

Programmable Digital Inputs/Outputs

The Micro-Tech has provision for up to 21 programmable digital inputs and 21 programmable digital outputs. Motherboard I/O includes two speed inputs and one digital pulse output. Optional I/O includes three programmable inputs and four programmable outputs. Optional DIO boards can be added, if additional I/O is required.

- Digital Inputs
  - Two (2) speed (DC) inputs on the motherboard. (See the Specifications in chapter 1.)
  - Three (3) programmable dry-contact inputs on the optional DC Input Board, or three (3) programmable opto-22 inputs modules on the optional Opto22 Input Board.
  - Eight (8) programmable inputs on the optional Digital I/O 8in/8out Board. Two of these boards may be installed for a total of sixteen (16) inputs.

- Digital Outputs
  - One (1) Digital Pulse Output on the motherboard. (See the Specifications in chapter 1.)
  - Four (4) programmable relay outputs on the optional Relay Output Board, or four (4) programmable opto-22 output modules on the optional Opto22 Output Board.
  - Eight (8) programmable outputs on the optional Digital I/O 8in/8out Board. Two of these boards may be installed for a total of sixteen (16) outputs.

Digital Input Expansion Boards

The board options are as follows.

- DC Input Board

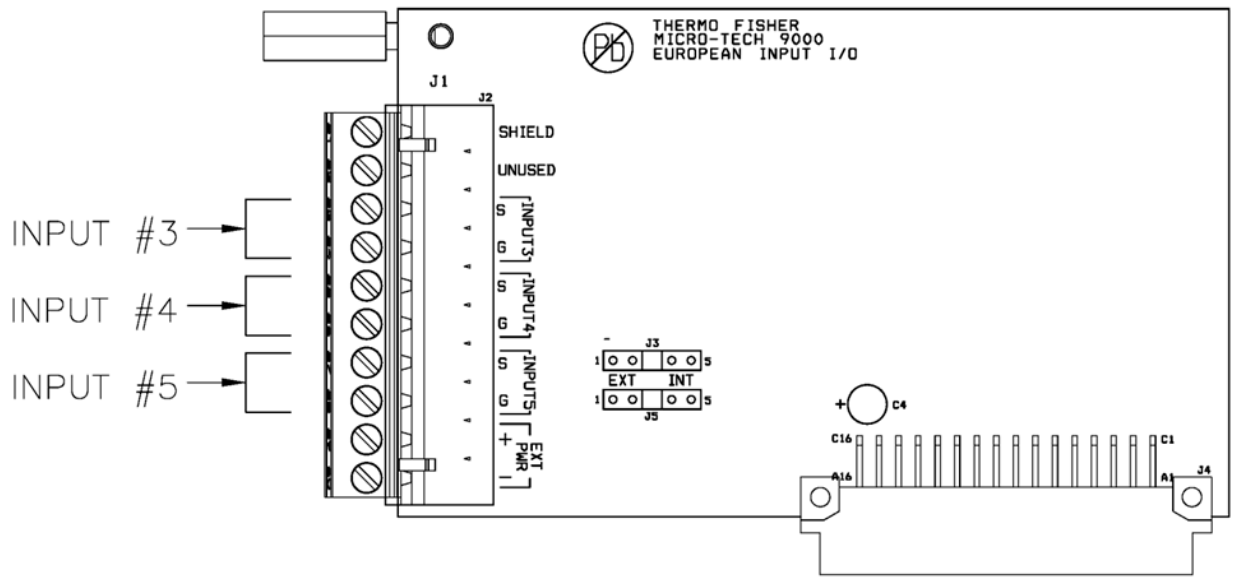
or

- Opto-22 Input Board

Install in expansion slot J6 on the motherboard. Use UL 1015 wire, 16AWG / 1 sq.mm or smaller

DC Input Board

This is an optional board with three inputs (inputs #3–5).
Type: Current sourcing to common ground. Designed for dry-contact input. Rated: 24VDC, 5mA typical. Input function is assigned by user.



Part number = 100785

Opto22 Input Board

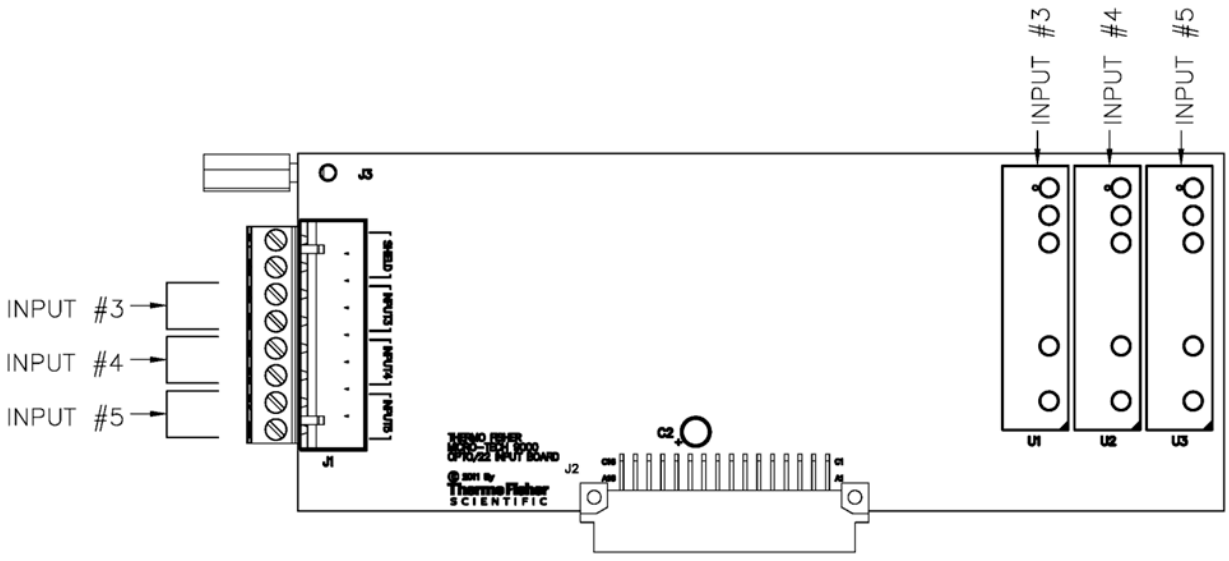
This is an optional board with three inputs (inputs #3–5). The module options are as follows.

- 240VAC In Module (G4IAC5A)
  - Input voltage range: 180-280 VAC or VDC.
  - Input current at maximum line: 5mA.

- 120VAC In Module (G4IAC5)
  - Input voltage range: 90-140 VAC or VDC.
  - Input current at maximum line: 5mA.

- 32VDC In Module (G4IDC5)
  - Input voltage range: 10-32VDC; 12-32VAC.
  - Input current at maximum line: 25mA.

Install in slots U1–U3 on the input board.



Part number = 102999

Digital Output Expansion Boards

The board options are as follows.

- Relay Output Board

or

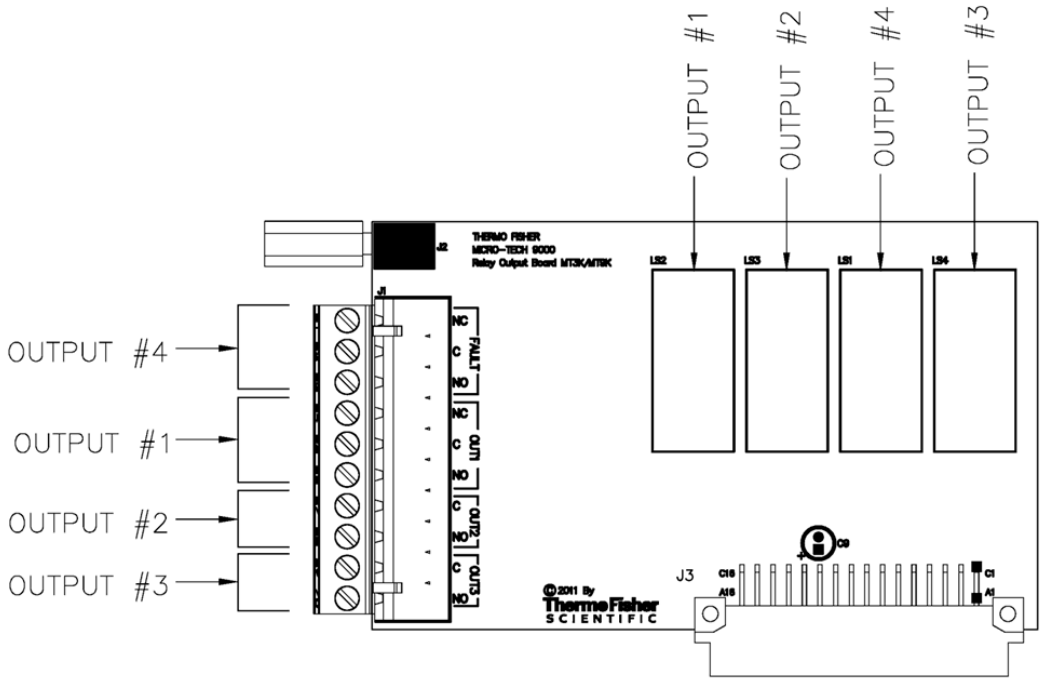
- Opto-22 Output Board

Install in expansion slot J7 on the motherboard. Use UL 1015 wire, 16AWG / 1 sq.mm or smaller.

Relay Output Board

This is an optional board.

- Four (4) outputs (outputs #1–4)
- Panel version
  - Rated: 33 VAC at 2A. Fusing requirement: 3A.
  - Rated: 70 VDC at 0.5A. Fusing requirement: 1A.
- Field version
  - Rated: 240 VAC at 3A. Fusing requirement:5A.
  - Rated: 70 VDC at 0.5A. Fusing requirement 1A.

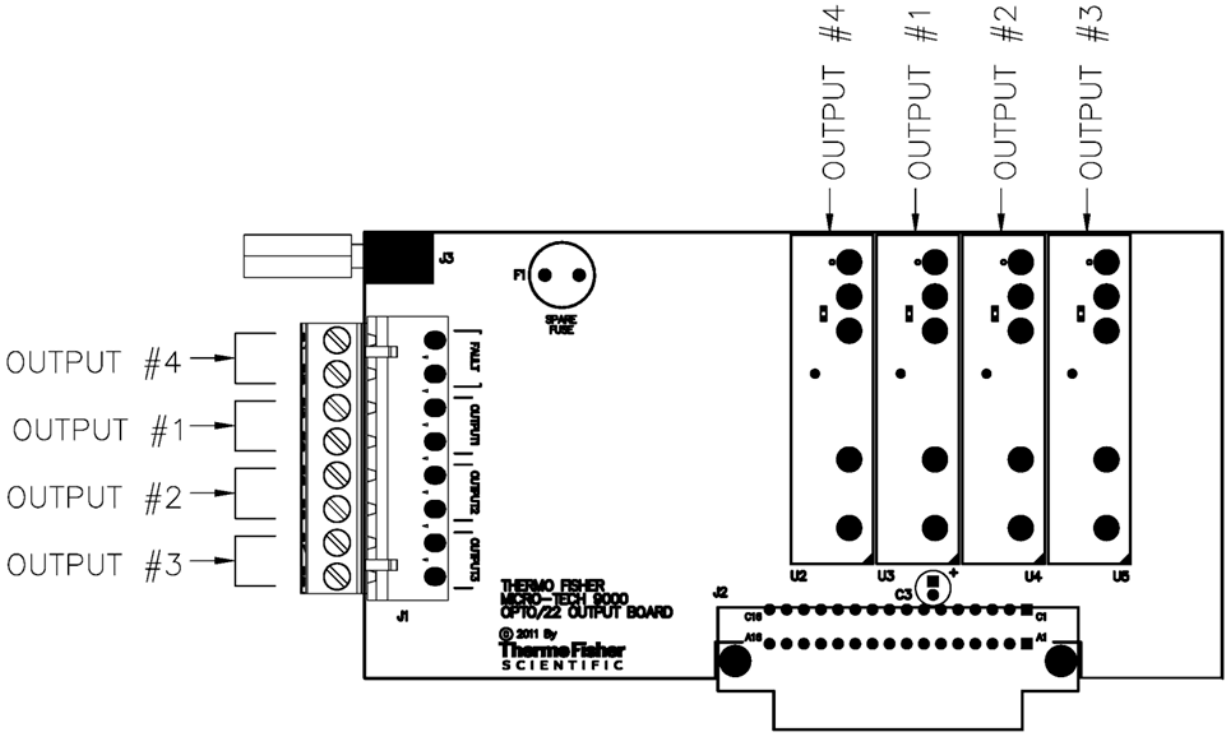


Part number = 102479

Opto22 Output Board

This is an optional board. There are four (4) outputs (outputs #1–4). Modules are installed in slots U2–U5 on the output board. One spare fuse is located on the output board. The module options are as follows.

- 240VAC Out Module, G4OAC5A.
  - Output voltage range: 24-280 VAC.
  - 2A at 50°C ambient.
  - Replaceable 250V 4A fuse.
- 60VDC Out Module, G4ODC5.
  - Output voltage range: 5-60 VDC.
  - 2A at 50°C ambient.
  - Replaceable 250V 4A fuse.
- Dry (Reed) Out Module, G4ODC5R.
  - Contact rating: 10 VA.
  - Maximum switching voltage: 100VDC, 130VAC.
  - Maximum switching current: 0.5A.
  - Replaceable 250V 1A fuse.



Part number = 103003

DIO 8in/8out Board

This is an optional board with eight (8) inputs (inputs #6–13) and eight (8) outputs (outputs #6–13). Install in one of the motherboard expansion slots J10–J13. Up to two boards may be installed for a total of 16 inputs/16 outputs.

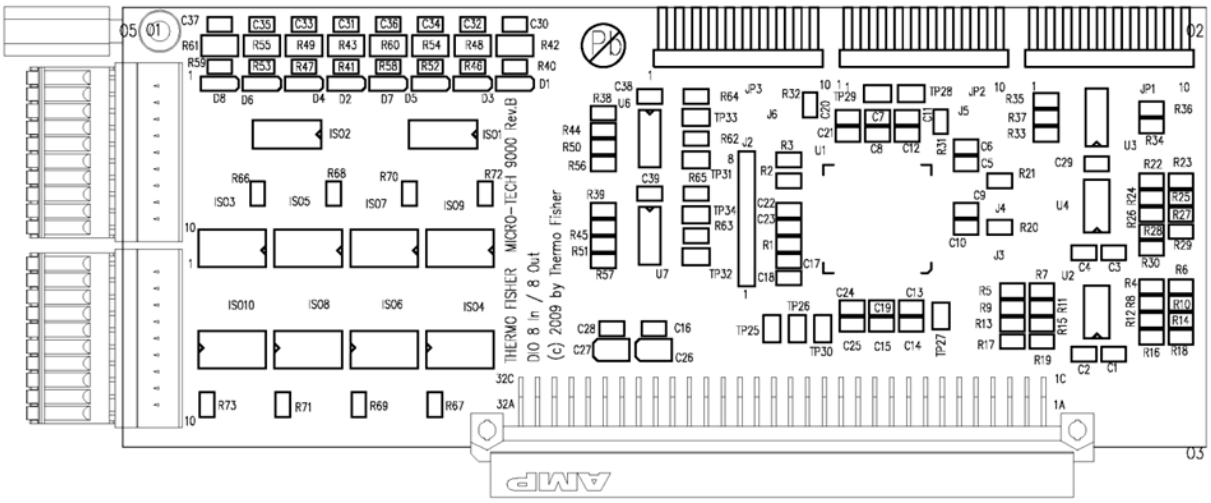
The DIO board provides isolated contact closure inputs and 24-volt current sinking or current sourcing isolated outputs. Output current must be limited to 80 mA maximum, continuous.

The inputs and outputs are powered by an external 24 VDC power source.

The isolated contact closure inputs are activated by completing the circuit from the input to the negative side of the 24 VDC supply. Approximately 12 mA of current flows out of each input during contact closure.

Output current sinking or sourcing is selectable thru a menu screen. Inputs are always current sourcing.

Board Diagram



Part number = 103017

Analog I/O Boards

The analog I/O board is available in two configurations described below. Type A has one current output only, whereas, Type B has two voltage inputs and two current outputs. The Micro-Tech can support up to four analog inputs and four analog outputs.

Type A: 4–20mA Output Board

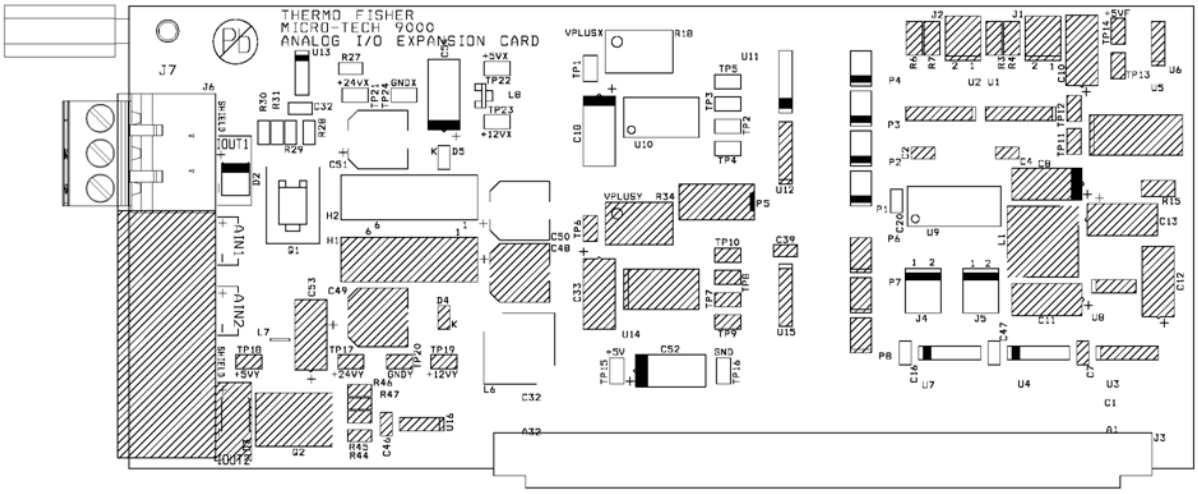
This is an optional board. Install in one of the motherboard expansion slots J10–J13. Single channel high-level current output.

- Outputs
  - Rate
  - Speed
  - Load
- Optically isolated
- Isolated power source
- Voltage output by adding an internal dropping resistor

- Output range (mA)
  - 0 to 20 mA
  - +4 to 20 mA
  - +20 to 4 mA
  - +20 to 0 mA

- Resistive load: 800 ohms max.
- Capacitive load: No limit
- Field wiring: Connections are made to the terminal strip on end of the 4-20mA Output Board. Note that connector is removable for ease of termination.

Board Diagram



Part number = 100744

Type B: Analog I/O Board

This is an optional board. Install in one of the motherboard expansion slots J10–J13.

- Inputs
  - Incline compensation
  - Moisture compensation
- Outputs
  - Rate
  - Speed
  - Load

High-Level Inputs (Two Channels)

Differential voltage.

- Input Range (Volts)
  - 0 to +5 V
  - +1 to +5 V
  - -5 to +5 V

Current (Requires Jumper Selection)

- Input Range (mA)
  - 0 to +20 mA
  - +4 to 20 mA
- Converted Display (Volts)
  - 0 to +5 V
  - +1 to +5 V
- Jumpers J1 and/or J2 are used to select 250 ohm resistance for the Current inputs.
- Input impedance: 100 k nominal (differential)
- Maximum usable input voltage: 106% of full scale
- Non-isolated voltage
- Max. non-destructive input voltage: 12V peak

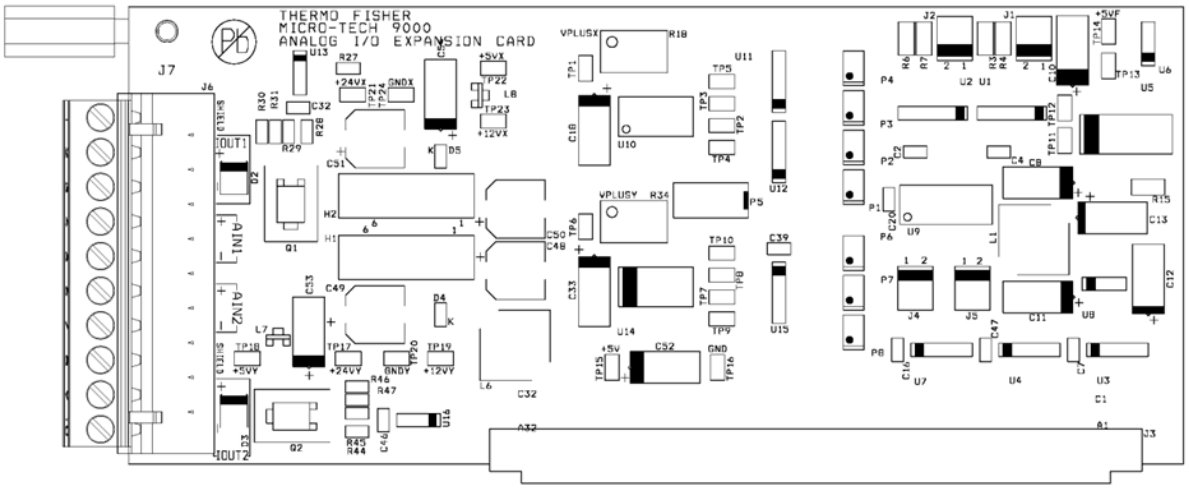
Current Outputs (Two Channels)

Here are the specifications.

- Optically isolated
- Isolated power source
- Output Range (mA)
  - 0 to 20 mA
  - +4 to 20 mA
- Voltage output by adding an internal dropping resistor.

- Resistive load: 800 ohms max.
- Capacitive load: No limit
- Field wiring: Connections are made to the terminal strip on end of the Analog I/O Board. Note that connector is removable for ease of termination.

Board Diagram



Part number = 102949

Dual-Plant Load-Cell A/D Board

This is an optional board. Install in one of the motherboard expansion slots J10–J13. For use with Model 9105 only.

Each load-cell channel provides its own buffer amplifiers for driving the A/D converter IC's differential reference voltage from the excitation sense voltage resistive divider. The load-cell signals are individually filtered then connected directly to the differential signal input of the A/D converter. Each load-cell also has an individual R-Cal relay and individual R-Cal resistor.

"Channel 1," top connector has jumpers J14 and J15 that allow selection of either external excitation sense (6-wire LC hook-up) or internal excitation sense (4-wire LC hook-up).

"Channel 2," bottom connector has jumpers J19 and J20 that allow selection of either external excitation sense (6-wire LC hook-up) or internal excitation sense (4-wire LC hook-up).

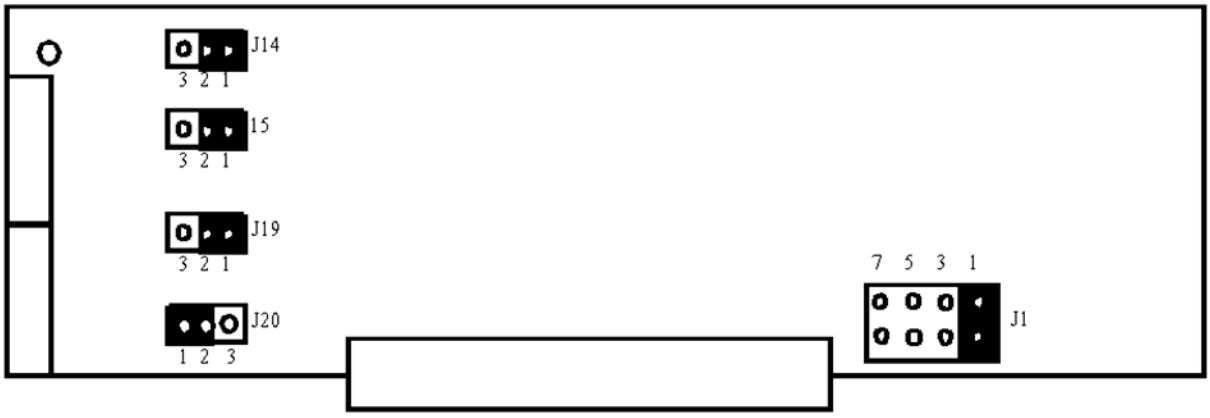
One of four different interrupt channels can be selected from J1 jumper. J1 is board interrupt 1-2 this is a factory installed jumper, do not move.

Load-Cell Sense Jumper Defaults

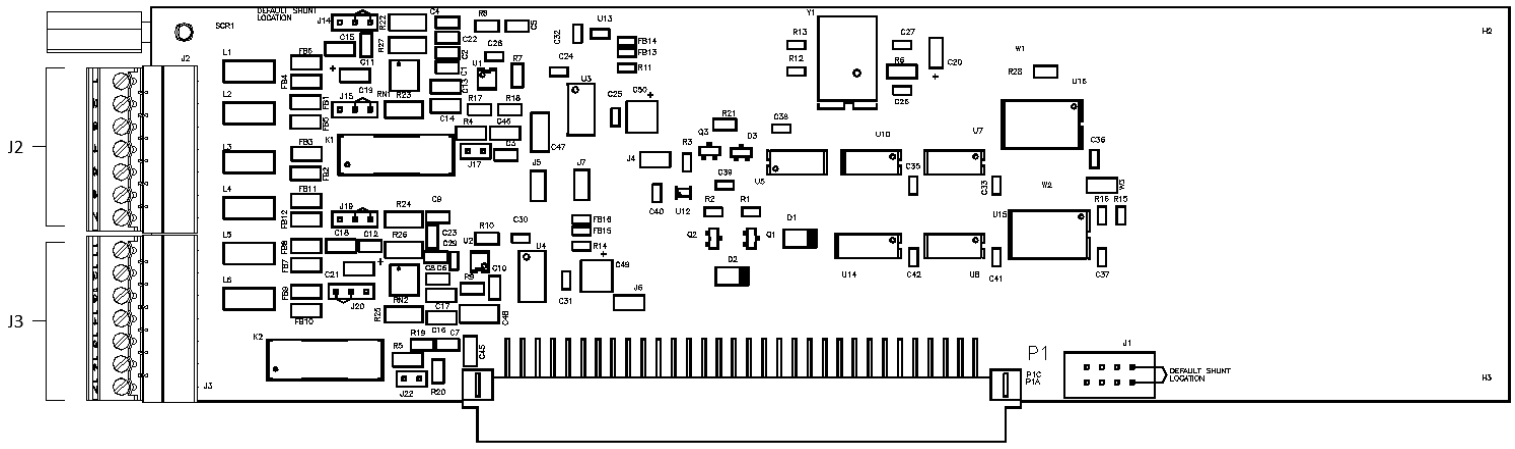
Jumper	Four-Wire Load-Cell (internal sense)	Six-Wire Load-Cell (external sense)
J14	1-2	2-3
J15	1-2	2-3
J19	1-2	2-3
J20	1-2	2-3

Factory option jumpers W2 and W3 allow the A/D converters to operate at either 10 conversions per second or at 80 conversions per second, which may be useful for "loss-in-weight" applications. The standard board is hard-wired for 10 conversions per second. Altering the W2/W3 option jumpers allows software selection of the desired conversion rate, so do *not* change.

Jumper Locations



Board Diagram



Part number = 102450

Communication Board

This is an optional board. Installed in one of the motherboard expansion slots J10–J13.

Serial Interface

- Type: Conforms to RS-232C, RS-485/422, and 20 mA standards; supports 2 and 4 wire multi-drop in RS-485. 20 mA loop is passive ONLY.
- Interfacing: RS-485 supports 2-wire or 4-wire multi-drop networking; RS-232C provides support for modem.
- Data rate: 300 to 19200, operator selectable from the keypad.
- Data format: Asynchronous, bit-serial, selectable parity, data length, and stop bits.
- Optical isolation, 250 Vrms max.
- Input voltage: ±30 Vdc max. (RS-232C)
- +15/-10 Vdc max. (RS-485)
- Cable length: 50 feet maximum (RS-232C)
- 4000 feet maximum (RS-485 and 20 mA)

For more information, see the 9105/9205 Reference manual.

Installation

To install the COMM board(s), do the following.

1. Select the jumper positions on the COMM board for the desired communication standard. Below is a table which summarizes the jumper positions for selection of the electrical interface. The jumper locations are shown below.

Jumpers						
Mode	OP1	OP2	OP3	OP4	OP5	OP6
RS-232	“A”	“A”	“A”	“A”	“A”	“B”
RS-485*	“B”	“A”	“B”	“B”	“MDP”	“TRM”
20 mA	“B”	“B”	“A”	“A”	“A”	“C”

* Default

“MDP”	“TRM”
For RS-485 *only*	For RS-485 *only*
OP5	OP6
“A” Normal	“A” Terminated
“B” Multi-drop	“B” Not terminated

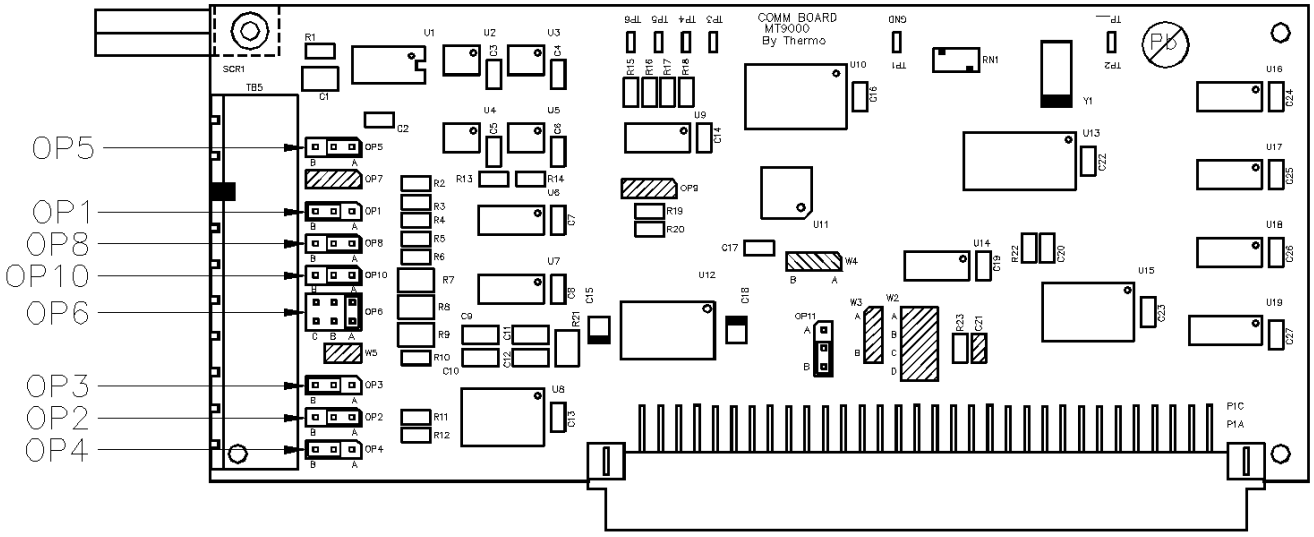
2. Open the Micro-Tech wall mount enclosure and turn power off at the mains, or remove panel mount enclosure from the panel and remove top cover allowing access to the motherboard.

3. Remove the field mating connector. Wire the connector per the supplied field-wiring diagram at the end of the manual.

4. Remove the hex head mounting screw from the connector end of the COMM board.

5. Insert the COMM board in any available expansion slot on the motherboard.

Board Diagram



Part number = 102942

Profibus-DP Board

This is an optional board. Install in one of the motherboard expansion slots J10–J13. No hardware configuration jumpers or switches are present on the Profibus-DP board.

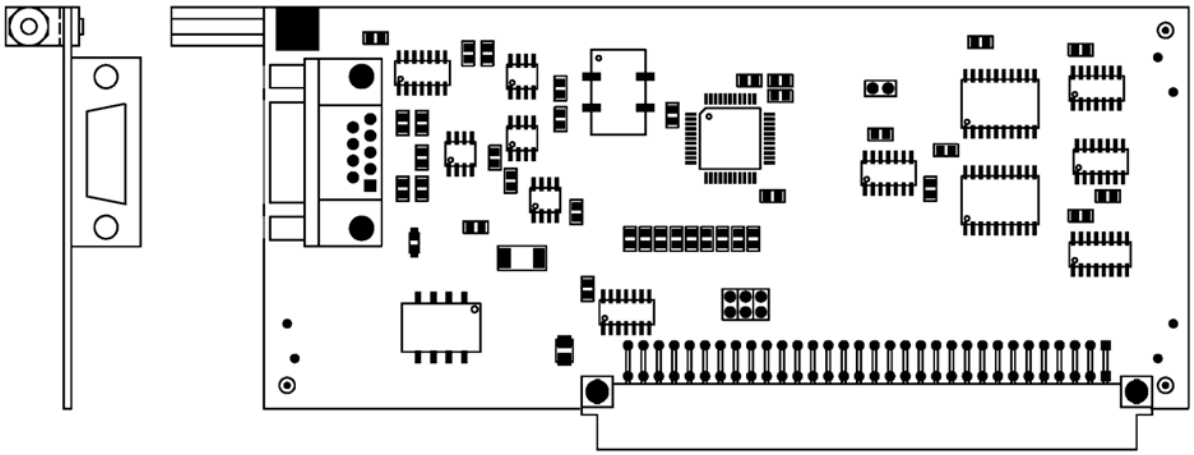
Profibus is a typical master/slave communication where the main PLC is the master or scanner, and the Micro-Tech device is a slave. The connection is EIA RS 485 through a 2-wire twinax Siemens cable.

Profibus-DP is the performance-optimized version specifically dedicated to time-critical communication between automation systems and distributed peripherals. It is typically used to transfer I/O images between a main PLC and remote devices (sensors, actuators, transmitters, etc.). In this case, it will be used to transfer (read and write) blocks of data.

The Profibus-DP interface board contains the Siemens SPC3 Profibus-DP controller ASIC. The SPC3 controller is an integrated circuit provided by Siemens that handles the interface between the Micro-Tech slave and the master.

See REC 4372 for details about the Profibus-DP option card.

Board Diagram



Part number = 102936

Glossary

A/D channel Analog/Digital channel. An electronic sub-unit on the Micro-Tech motherboard that handles the load-cell(s) input. Your Micro-Tech motherboard is equipped with two A/D channels, but the dual A/D printed-circuit-board assembly can be ordered as an option.

AZT Auto zero-tracking.

Belt-scale code This code describes your exact belt-scale set-up and allows the Micro-Tech to set the relevant menu defaults for you. Please write down your belt-scale code before contacting Thermo Fisher Scientific for help.

Console The main operating panel of the Micro-Tech including the display, keypad, arrow buttons, and soft keys.

DIO A digital-input/output board.

display In the console, the small square screen that displays Micro-Tech results, menus, and so forth.

kg Kilogram.

kg/h Kilograms per hour.

kg/min Kilograms per minute.

Lb/hr Pounds per hour.

Lb/mn Pounds per minute.

Lt/min Long tons per minute.

LTons The “long ton,” equivalent to 2,240 lbs.

LTph Long tons per hour.

Mixed units A menu choice that allows the Micro-Tech to display a mixture of English and metric units.

mV/V Millivolts per volt. A measure of the sensitivity of a load cell.

pcba Printed-circuit board assembly.

PEIC Periodic-error-integrating control.

PID Proportional, integral, derivative control.

Scroll When used as a noun (for example, when the word appears in the Micro-Tech display), it means “menu.” When used as a verb (for example, “Scroll down to...”), it means press the up- or down-arrow button to move to one of the Micro-Tech menus.

Soft key One of the four buttons at the bottom of the Micro-Tech display that allows you to access various context-sensitive Micro-Tech commands—such as Edit, Enter, Continue, and so forth.

Standard (US) ton Equivalent to 2,000 lbs.

t/hr Metric tons per hour.

t/min Metric tons per minute.

T/mn Standard US tons/minute.

Ton Standard (2,000# or 2,000 lb.) tons per hour.

tonne The “metric tonne” equivalent to 1,000 kg.

Tph Tons per hour.

Totalizer The Totalizer shows the total tons accumulated by the Micro-Tech.

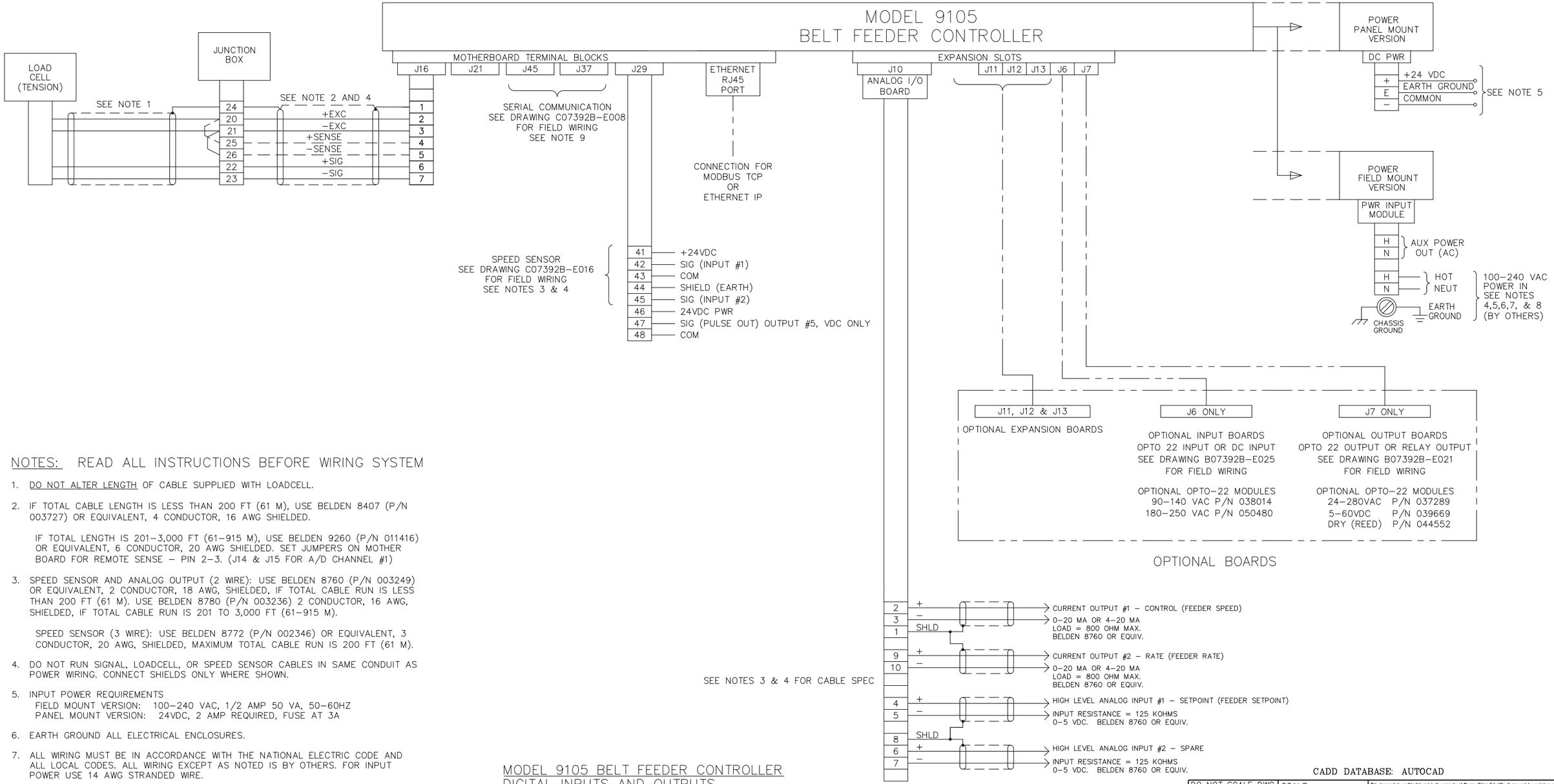
Weigh-bridge Another name for a scale.

Attached Drawings

The following information is appended to the manual to help you install and maintain your Micro-Tech.

Description	Document
Field-Wiring Diagrams	
Micro-Tech 9105	D07392B-E033
Micro-Tech 9205	D07392B-E036
Analog I/O Board	B07392B-E003
8-In/8-Out Digital Board	B07392B-E005
Serial Communication	C07392B-E008
Siemens Profibus Board	C07392B-E011
Speed Sensors	C07392B-E016
Communication Board	C07392B-E017
Notes—Micro-Tech 9000	C07392B-E018
Digital Output Boards	C07392B-E021
Anybus Comm for Device Net	B07392B-E022
Digital Input Boards	B07392B-E025
4–20mA Out Board	B07392B-E026
Dual Plant LC A/D Board	B07392B-E027
Premium A/D Board	B07392B-E028

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



NOTES: READ ALL INSTRUCTIONS BEFORE WIRING SYSTEM

1. DO NOT ALTER LENGTH OF CABLE SUPPLIED WITH LOADCELL.
2. IF TOTAL CABLE LENGTH IS LESS THAN 200 FT (61 M), USE BELDEN 8407 (P/N 003727) OR EQUIVALENT, 4 CONDUCTOR, 16 AWG SHIELDED.

   IF TOTAL LENGTH IS 201−3,000 FT (61−915 M), USE BELDEN 9260 (P/N 011416) OR EQUIVALENT, 6 CONDUCTOR, 20 AWG SHIELDED. SET JUMPERS ON MOTHER BOARD FOR REMOTE SENSE − PIN 2−3. (J14 & J15 FOR A/D CHANNEL #1)
3. SPEED SENSOR AND ANALOG OUTPUT (2 WIRE): USE BELDEN 8760 (P/N 003249) OR EQUIVALENT, 2 CONDUCTOR, 18 AWG, SHIELDED, IF TOTAL CABLE RUN IS LESS THAN 200 FT (61 M). USE BELDEN 8780 (P/N 003236) 2 CONDUCTOR, 16 AWG, SHIELDED, IF TOTAL CABLE RUN IS 201 TO 3,000 FT (61−915 M).

   SPEED SENSOR (3 WIRE): USE BELDEN 8772 (P/N 002346) OR EQUIVALENT, 3 CONDUCTOR, 20 AWG, SHIELDED, MAXIMUM TOTAL CABLE RUN IS 200 FT (61 M).
4. DO NOT RUN SIGNAL, LOADCELL, OR SPEED SENSOR CABLES IN SAME CONDUIT AS POWER WIRING. CONNECT SHIELDS ONLY WHERE SHOWN.
5. INPUT POWER REQUIREMENTS
   FIELD MOUNT VERSION: 100−240 VAC, 1/2 AMP 50 VA, 50−60HZ
   PANEL MOUNT VERSION: 24VDC, 2 AMP REQUIRED, FUSE AT 3A
6. EARTH GROUND ALL ELECTRICAL ENCLOSURES.
7. ALL WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL LOCAL CODES. ALL WIRING EXCEPT AS NOTED IS BY OTHERS. FOR INPUT POWER USE 14 AWG STRANDED WIRE.
8. A READILY ACCESSIBLE DISCONNECT DEVICE (MAXIMUM 20 AMP) SHALL BE INCORPORATED IN THE FIELD WIRING. THIS DISCONNECT DEVICE SHOULD BE IN EASY REACH OF THE OPERATOR AND IT MUST BE MARKED AS THE DISCONNECTING DEVICE FOR THE EQUIPMENT.
9. SELECTION OF SERIAL COMMUNICATION (RS−232 OR RS−485) IS DETERMINED BY COMM JUMPER OPTIONS. REFER TO OPERATING & SERVICE MANUAL FOR CONFIGURATION INSTRUCTIONS.

MODEL 9105 BELT FEEDER CONTROLLER DIGITAL INPUTS AND OUTPUTS

REQUIRED DIGITAL INPUTS AND OUTPUTS
INPUT: RUNNING (FEEDER RUNNING)
OUTPUT: NONE

AVAILABLE DIGITAL INPUT AND OUTPUT ASSIGNMENT CHOICES
MOTHERBOARD TERMINAL BLOCK J29 − (INPUT #2 AND OUTPUT #5)
EXPANSION SLOT J6 − OPTIONAL INPUT BOARD (INPUTS #3, #4, #5)
EXPANSION SLOT J7 − OPTIONAL OUTPUT BOARD (OUTPUTS #1, #2, #3, #4)

CADD DATABASE: AUTOCAD

REV	ECO NO		DESCRIPTION	DATE	BY / APPD
A	3322	MICRO	RELEASED	4/19/13	PEP / MFM

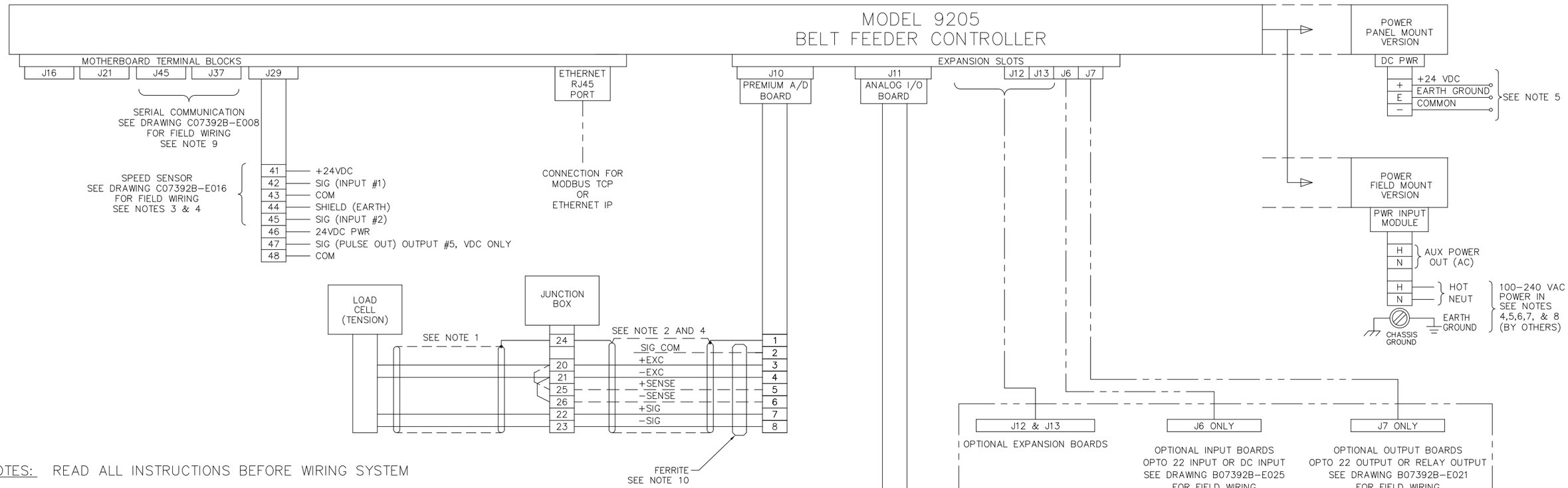
DO NOT SCALE DWG			SCALE		
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES			JOB NO		
TOLERANCE UNLESS SPECIFIED		OTHERWISE	ENG	PEP	DATE 11/7/12
X	± .1	± 3 mm			
.X	± .06	± 1.5 mm	DWN	PEP	DATE 11/7/12
.XX	± .03	± .76 mm			
.XXX	± .010	± .254 mm	CHK	MFM	DATE 11/7/12
FRACT.	± 1/16	± N/A			
ANGLES	± 1/2°	± 1/2°			
NEXT ASS'Y					
CUST ORDER NO					
CUSTOMER LOCATION					
USER LOCATION					
Derived From					

Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
MICRO−TECH 9105

PART NO	DRAWING NUMBER	REV
	D07392B−E033	A

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



NOTES: READ ALL INSTRUCTIONS BEFORE WIRING SYSTEM

1. DO NOT ALTER LENGTH OF CABLE SUPPLIED WITH LOADCELL.
2. IF TOTAL CABLE LENGTH IS LESS THAN 200 FT (61 M), USE BELDEN 8407 (P/N 003727) OR EQUIVALENT, 4 CONDUCTOR, 16 AWG SHIELDED.

   IF TOTAL LENGTH IS 201–3,000 FT (61–915 M), USE BELDEN 9260 (P/N 011416) OR EQUIVALENT, 6 CONDUCTOR, 20 AWG SHIELDED. SET JUMPERS ON MOTHER BOARD FOR REMOTE SENSE – PIN 2–3. (J14 & J15 FOR A/D CHANNEL #1)
3. SPEED SENSOR AND ANALOG OUTPUT (2 WIRE): USE BELDEN 8760 (P/N 003249) OR EQUIVALENT, 2 CONDUCTOR, 18 AWG, SHIELDED, IF TOTAL CABLE RUN IS LESS THAN 200 FT (61 M). USE BELDEN 8780 (P/N 003236) 2 CONDUCTOR, 16 AWG, SHIELDED, IF TOTAL CABLE RUN IS 201 TO 3,000 FT (61–915 M).

   SPEED SENSOR (3 WIRE): USE BELDEN 8772 (P/N 002346) OR EQUIVALENT, 3 CONDUCTOR, 20 AWG, SHIELDED, MAXIMUM TOTAL CABLE RUN IS 200 FT (61 M).
4. DO NOT RUN SIGNAL, LOADCELL, OR SPEED SENSOR CABLES IN SAME CONDUIT AS POWER WIRING. CONNECT SHIELDS ONLY WHERE SHOWN.
5. INPUT POWER REQUIREMENTS
   FIELD MOUNT VERSION: 100–240 VAC, 1/2 AMP 50 VA, 50–60HZ
   PANEL MOUNT VERSION: 24VDC, 2 AMP REQUIRED, FUSE AT 3A
6. EARTH GROUND ALL ELECTRICAL ENCLOSURES.
7. ALL WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL LOCAL CODES. ALL WIRING EXCEPT AS NOTED IS BY OTHERS. FOR INPUT POWER USE 14 AWG STRANDED WIRE.
8. A READILY ACCESSIBLE DISCONNECT DEVICE (MAXIMUM 20 AMP) SHALL BE INCORPORATED IN THE FIELD WIRING. THIS DISCONNECT DEVICE SHOULD BE IN EASY REACH OF THE OPERATOR AND IT MUST BE MARKED AS THE DISCONNECTING DEVICE FOR THE EQUIPMENT.
9. SELECTION OF SERIAL COMMUNICATION (RS–232 OR RS–485) IS DETERMINED BY COMM JUMPER OPTIONS. REFER TO OPERATING & SERVICE MANUAL FOR CONFIGURATION INSTRUCTIONS.
10. USE FERRITE SUPPLIED WITH THE MICRO–TECH. SHIELD WIRE DOES NOT GO THRU THE FERRITE.

MODEL 9205 BELT FEEDER CONTROLLER DIGITAL INPUTS AND OUTPUTS

REQUIRED DIGITAL INPUTS AND OUTPUTS
INPUT: RUNNING (FEEDER RUNNING)
OUTPUT: NONE

AVAILABLE DIGITAL INPUT AND OUTPUT ASSIGNMENT CHOICES
MOTHERBOARD TERMINAL BLOCK J29 – (INPUT #2 AND OUTPUT #5)
EXPANSION SLOT J6 – OPTIONAL INPUT BOARD (INPUTS #3, #4, #5)
EXPANSION SLOT J7 – OPTIONAL OUTPUT BOARD (OUTPUTS #1, #2, #3, #4)

CADD DATABASE: AUTOCAD

REV	ECO NO		DESCRIPTION	DATE	BY
A	3322	MICRO	RELEASED	4/29/13	PEP / MFM / APPD

DO NOT SCALE DWG — REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

TOLERANCE UNLESS SPECIFIED OTHERWISE				
X	± .1	± 3 mm	ENG PEP	DATE 11/7/12
.X	± .05	± 1.5 mm		
.XX	± .03	± .76 mm	DWN PEP	DATE 11/7/12
.XXX	± .010	± .254 mm		
FRACT.	± 1/16	± N/A	CHK MFM	DATE 11/7/12
ANGLES	± 1/2°	± 1/2°		

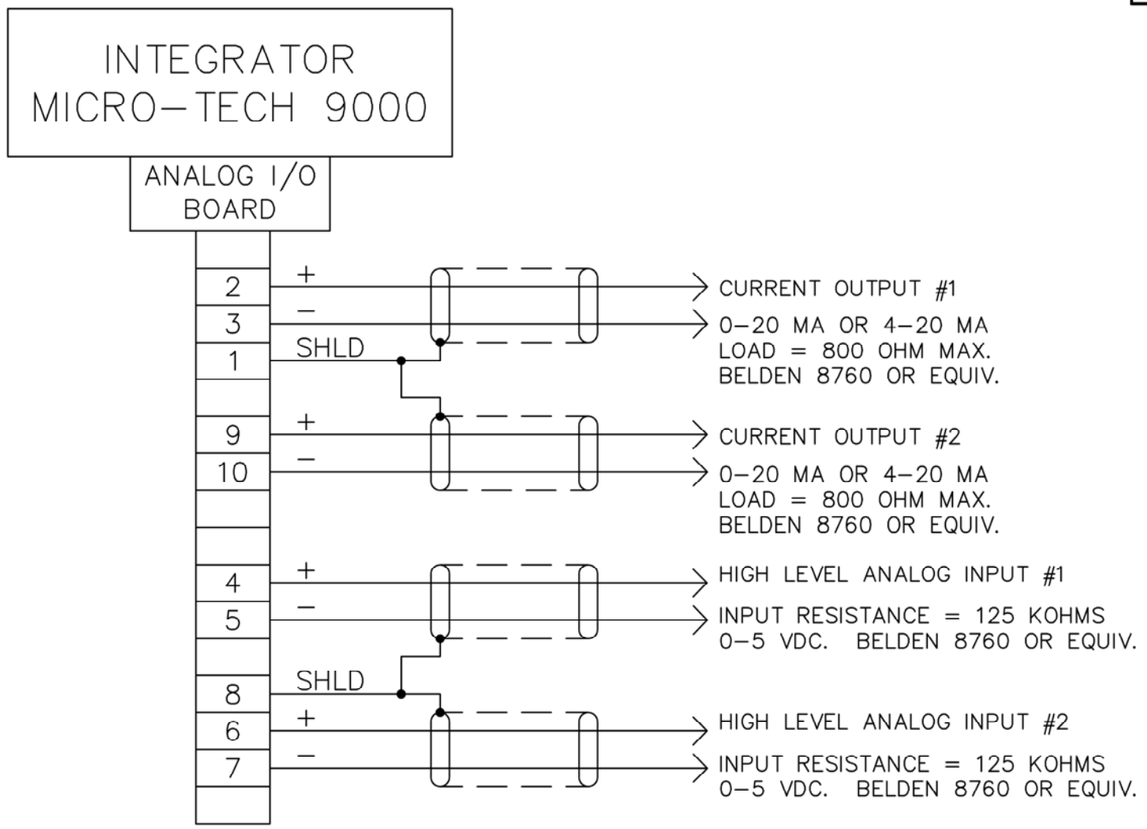
SCALE
JOB NO
NEXT ASS'Y
CUST ORDER NO
CUSTOMER LOCATION
USER LOCATION
Derived From

Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
MICRO–TECH 9205

PART NO	DRAWING NUMBER	REV.
	D 07392B–E036	A

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



NOTES: READ ALL INSTRUCTIONS BEFORE WIRING SYSTEM

1. DO NOT RUN ANALOG SIGNAL CABLES IN SAME CONDUIT AS POWER WIRING. CONNECT SHIELDS ONLY WHERE SHOWN.
2. ALL WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL LOCAL CODES. ALL WIRING, EXCEPT AS NOTED, IS THE RESPONSIBILITY OF THE CUSTOMER.
3. INSTALL IN ONE OF THE EXPANSION SLOTS J10 TO J13.
4. CONNECT SHIELDS ONLY AS SHOWN.
   CABLE TYPE: BELDEN 8760 OR EQUIVALENT.

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
A	2959		RELEASED	6/6/12	PEP / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED		OTHERWISE
X	± .1	± 3 mm
.X	± .06	± 1.5 mm
.XX	± .03	± .76 mm
.XXX	± .010	± .254 mm
FRACT.	± 1/16	± N/A
ANGLES	± 1/2°	± 1/2°

ENG	MFM	DATE 8/26/11
DWN	MFM	DATE 8/28/11
CHK	MFM	DATE 8/26/22

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

Thermo Fisher SCIENTIFIC

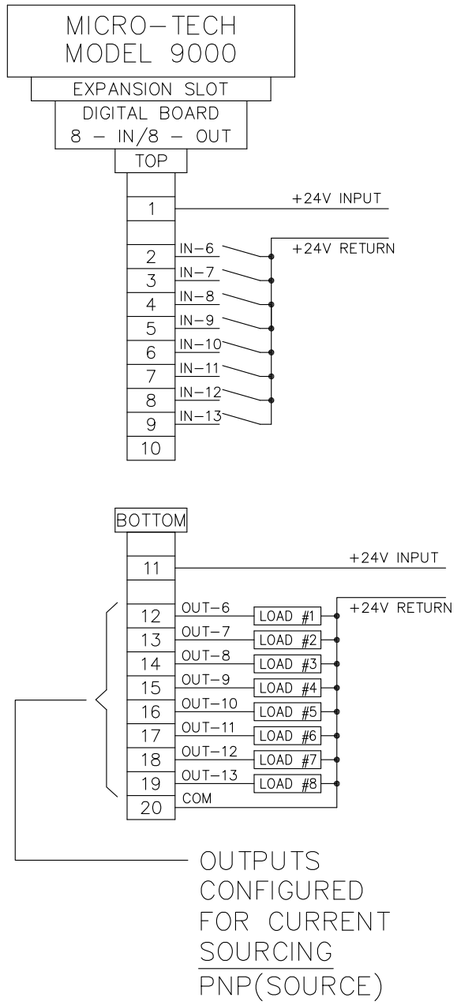
FIELD WIRING DIAGRAM
ANALOG INPUT/OUTPUT BOARD
MICRO–TECH 9000

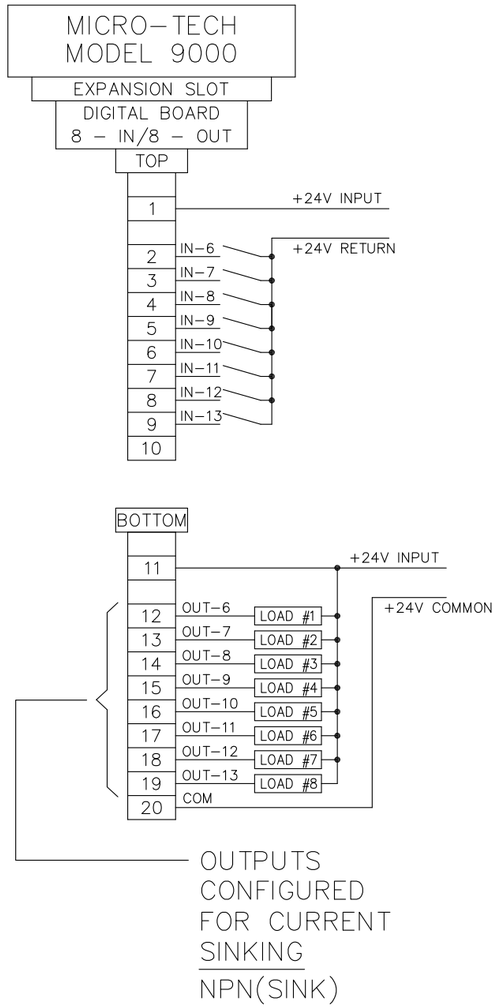
PART NO	DRAWING NUMBER	REV
	B07392B–E003	A

Derived From C07361B–E003

4 3 2 1

B A





ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC

NOTES: *READ ALL INSTRUCTIONS BEFORE WIRING SYSTEM*

1. ALL WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL LOCAL CODES. ALL WIRING, EXCEPT AS NOTED, IS THE RESPONSIBILITY OF THE CUSTOMER.
2. INSTALL IN ONE OF THE MOTHERBOARD EXPANSION SLOTS, J10 TO J13.

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
B	3322		ADDED PNP(SOURCE) & NPN(SINK)	4/22/13	PEP / DCS
A	2959		RELEASED	6/6/12	RAE / DCS

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE			
X	± .1	± 3 mm	
.X	± .06	± 1.5 mm	
.XX	± .03	± 76 mm	
.XXX	± .010	± 254 mm	
FRACT.	± 1/16	± N/A	
ANGLES	± 1/2°	± .1/2°	

ENG	MFM	DATE 8/26/11
DWN	MFM	DATE 8/26/11
CHK	MFM	DATE 8/26/11

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
8–IN/8–OUT DIGITAL BOARD
MICRO–TECH 9000

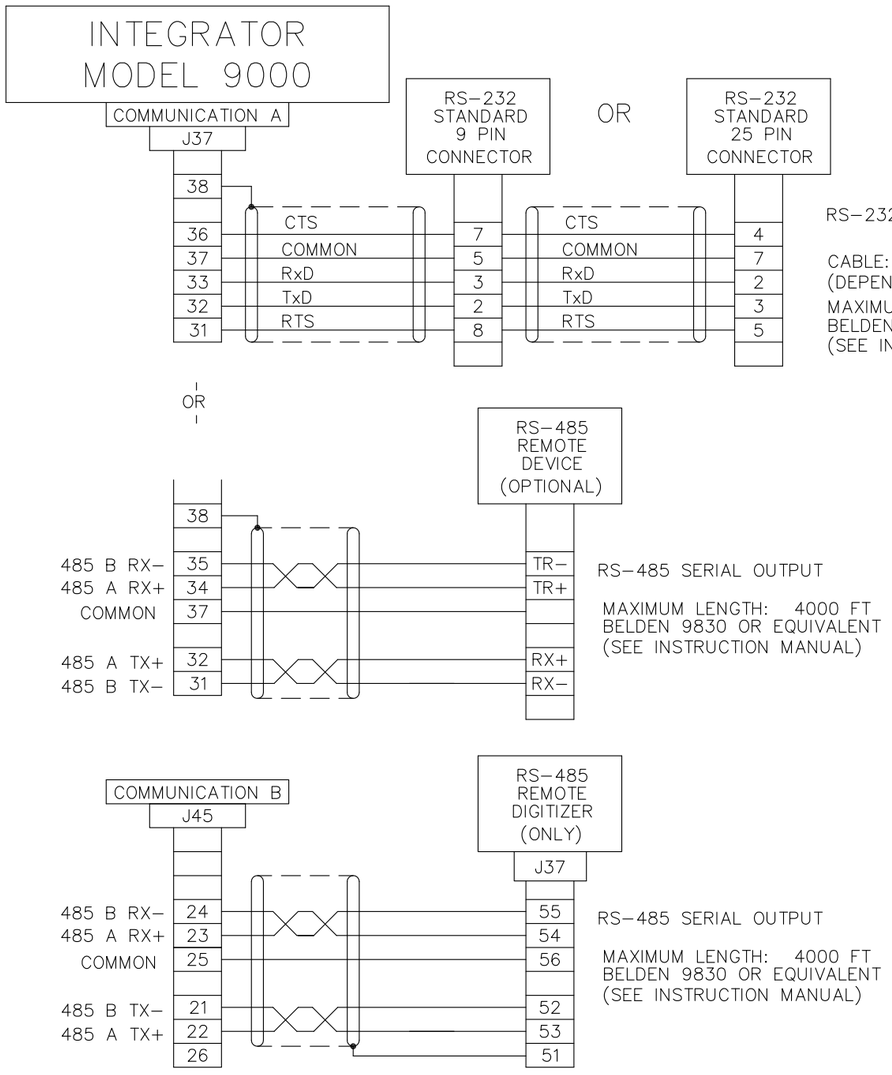
PART NO	DRAWING NUMBER	REV
	C07392B–E005	B

Derived From 07361B–E005

6 5 4 3 2 1

D C B A

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



NOTES: READ ALL INSTRUCTIONS BEFORE WIRING SYSTEM

1. DO NOT RUN COMMUNICATION WIRING IN SAME CONDUIT AS POWER WIRING. CONNECT SHIELDS ONLY WHERE SHOWN.
2. ALL WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL LOCAL CODES. ALL WIRING, EXCEPT AS NOTED, IS THE RESPONSIBILITY OF THE CUSTOMER.
3. SELECTION OF SERIAL COMMUNICATION (20ma, RS-232, OR RS-485) IS DETERMINED BY COMM JUMPER OPTIONS. REFER TO OPERATING & SERVICE MANUAL FOR CONFIGURATION INSTRUCTIONS. FACTORY SET FOR 20ma/RS-485.

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
C	3459		CORRECTED DIGITIZER TERMINALS AND SHIELD	4/2/14	PEP / PEP
B	3403		CORRECTED POLARITIES ON TERMINAL DESCRIPTIONS.	11/18/13	PEP / MFM
A	2959		RELEASED	6/6/12	RAE / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE
UNLESS SPECIFIED OTHERWISE DIMENSIONS ARE IN INCHES AND [mm]
X.X [X] ± .06 ± 1.5 mm
X.XX [X.X] ± .03 ± .8 mm
X.XXX [X.XX] ± .01 ± .3 mm
FRACT. ± 1/16 ± N/A
ANGLES ± 1/2° ± 1/2°

ENG	MFM	8/26/11
DWN	RAE	8/26/11
CHK	MFM	8/26/11

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

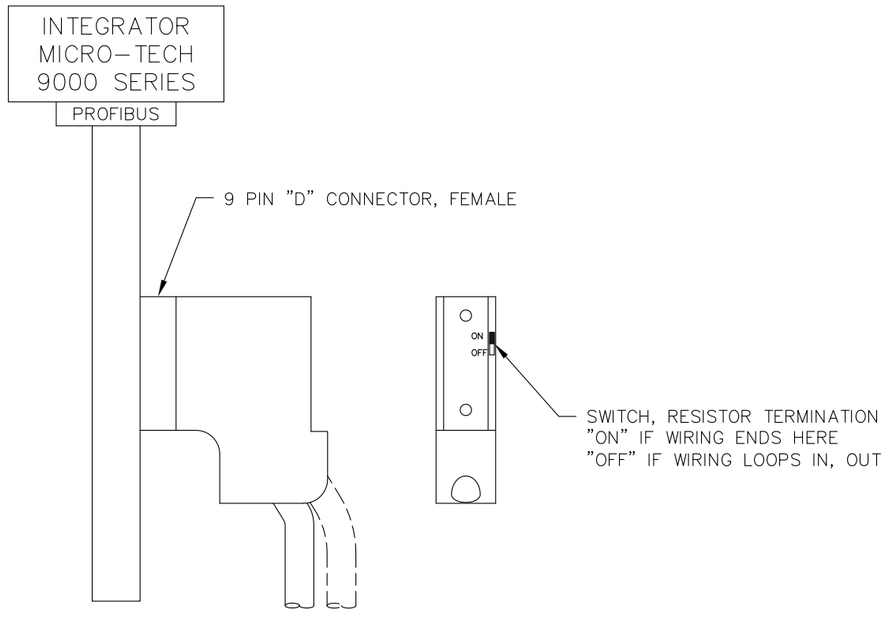
Thermo Fisher SCIENTIFIC

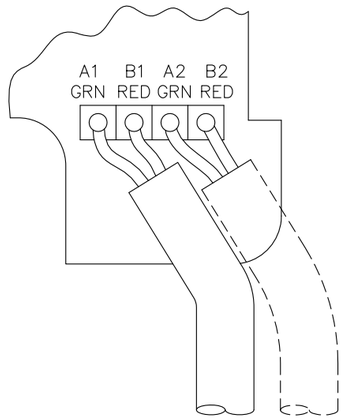
FIELD WIRING DIAGRAM
SERIAL COMMUNICATION
MICRO-TECH 9000

PART NO	DRAWING NUMBER	REV
	C07392B-E008	C

Derived From _____

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC
1	102936	1 EA	PCBA,PROFIBUS BD,MT2000/MT9000	D07392A-E010
2	057415	1 EA	CABLE,SHLD, STD,"PROFIBUS"	6XV1830-0AH10
3	057416	1 EA	CONN,HSG,"D","PROFIBUS",SWIVEL	
4	048501	1 EA	LABEL,PCBA,COMM BD,M-T 2000	B07257B-Y001-03





NOTES: READ ALL INSTRUCTIONS BEFORE WIRING SYSTEM

1. DO NOT RUN PROFIBUS CABLES IN SAME CONDUIT AS POWER WIRING. CONNECT SHIELDS ONLY WHERE SHOWN.
2. ALL WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL LOCAL CODES. ALL WIRING, EXCEPT AS NOTED, IS THE RESPONSIBILITY OF THE CUSTOMER.
3. CONNECT SHIELDS ONLY AS SHOWN. CABLE TYPE: SIEMENS 6XV1830-0AH10
4. INSTALL IN ONE OF THE EXPANSION SLOTS J10 TO J13.

CADD DATABASE: AUTOCAD

A	2959		RELEASED	6/6/12	PEP	MFM	
REV	ECO NO	MICRO	DESCRIPTION	DATE	BY	APPD	

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE				
X	± .1	± 3 mm	ENG MFM	DATE 8/26/11
.X	± .06	± 1.5 mm	DWN MFM	DATE 8/26/11
.XX	± .03	± .76 mm	CHK MFM	DATE 8/26/11
.XXX	± .010	± .254 mm		
FRACT.	± 1/16	± N/A		
ANGLES	± 1/2°	± 1/2°		

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

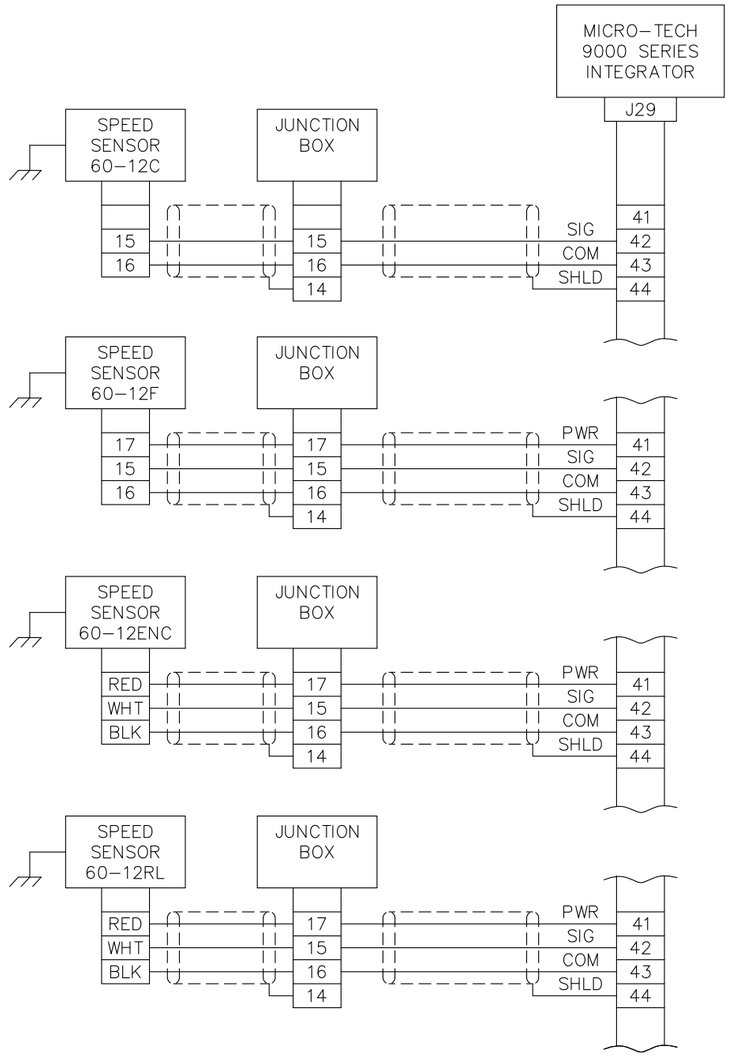
Derived From C07361B-E011

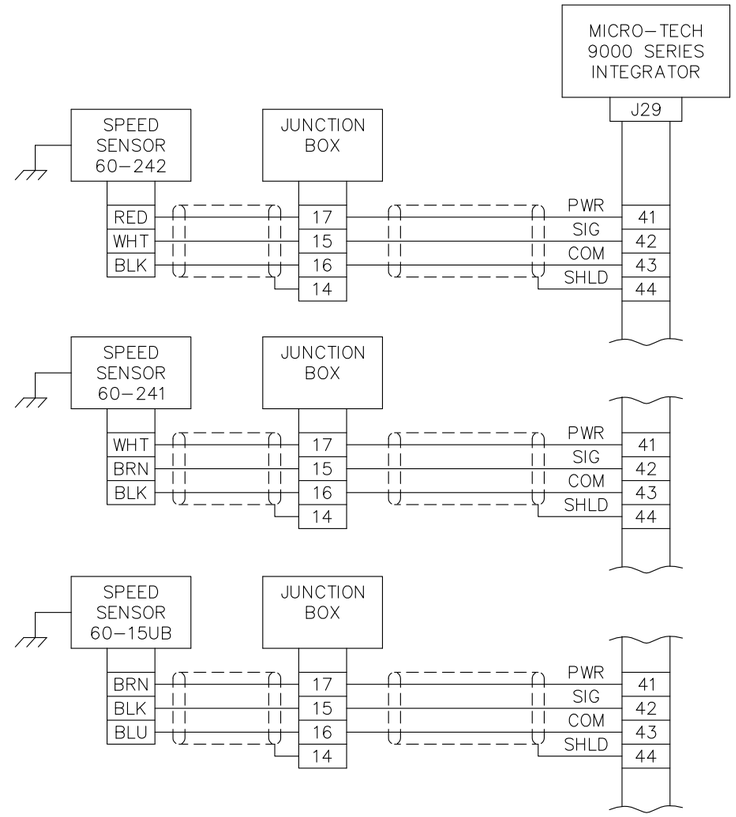
Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
SIEMENS PROFIBUS BOARD
MICRO-TECH 9000

PART NO	DRAWING NUMBER	REV
	C07392B-E011	A

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC





⚠ WARNING

INCORRECT WIRING WILL PERMANENTLY DAMAGE INSTRUMENT & VOID WARRANTY

NOTES:

1. 2 WIRE SPEED SENSOR: USE BELDEN 8760 (P/N 003249) OR EQUIVALENT, 2 CONDUCTOR, 18 AWG, SHIELDED, IF TOTAL CABLE RUN IS LESS THAN 200 FT (61 M). USE BELDEN 8780 (P/N 003236) 2 CONDUCTOR, 16 AWG, SHIELDED, IF TOTAL CABLE RUN IS 201 TO 3,000 FT (61–915 M).

   3 WIRE SPEED SENSOR: USE BELDEN 8772 (P/N 002346) OR EQUIVALENT, 3 CONDUCTOR, 20 AWG, SHIELDED, MAXIMUM TOTAL CABLE RUN IS 200 FT (61 M).

2. REFER TO 60–12C WIRING FOR 61–12C SPEED SENSORS.

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
C	3044		CORRECTED 60–15UB WIRE COLORS	2/28/13	PEP / KIM
B	2985		ADDED NOTE AND WARNING FOR 60–12F WIRING	1/10/12	KIM / KIM
A	2959		RELEASED	6/6/12	KIM / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE

JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE			ENG	DATE
X	± .1	± 3 mm	MFM	9/14/11
.X	± .06	± 1.5 mm	DWN KIM	DATE 9/14/11
.XX	± .03	± .76 mm		
.XXX	± .010	± .254 mm	CHK MFM	DATE 6/6/12
FRACT.	± 1/16	± N/A		
ANGLES	± 1/2°	± 1/2°		

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

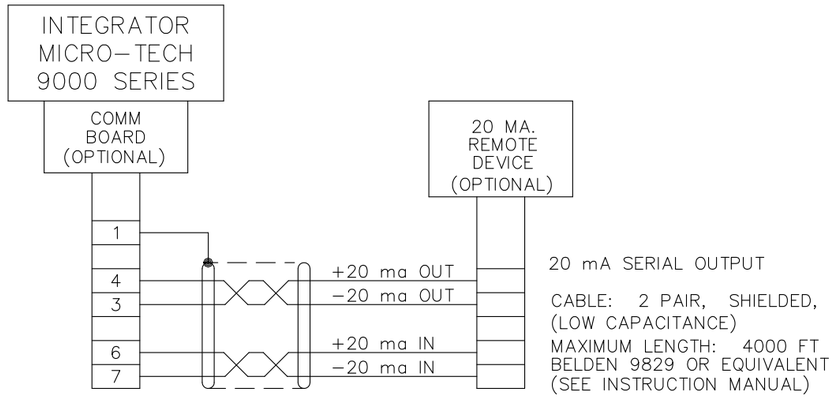
Derived From _____

Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
SPEED SENSORS
MICRO–TECH 9000

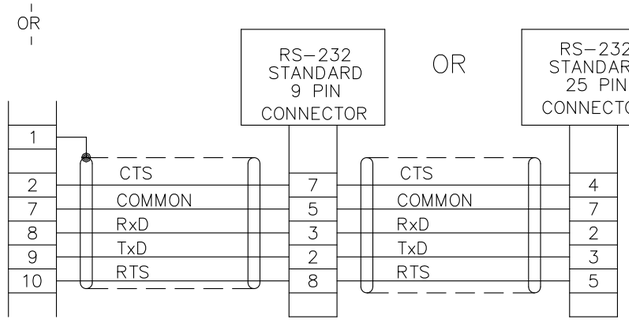
PART NO	DRAWING NUMBER	REV
	C07392B–E016	C

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



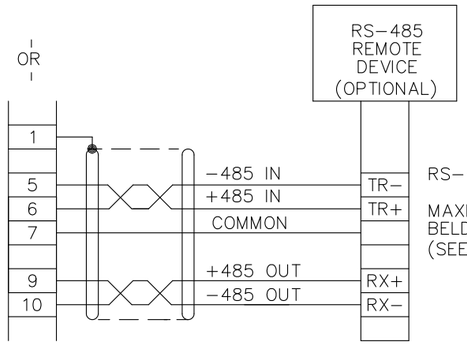
20 mA SERIAL OUTPUT

CABLE: 2 PAIR, SHIELDED,
(LOW CAPACITANCE)
MAXIMUM LENGTH: 4000 FT
BELDEN 9829 OR EQUIVALENT
(SEE INSTRUCTION MANUAL)



RS–232 SERIAL OUTPUT

CABLE: 8 CONDUCTOR, SHIELDED,
(DEPENDING ON APPLICATION)
MAXIMUM LENGTH: 50 FT
BELDEN 9538 OR EQUIVALENT
(SEE INSTRUCTION MANUAL)



RS–485 SERIAL OUTPUT

MAXIMUM LENGTH: 4000 FT
BELDEN 9830 OR EQUIVALENT
(SEE INSTRUCTION MANUAL)

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY PEP / APPD
A	2959		RELEASED	6/6/12	MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE

X	± .1	± 3 mm		
.X	± .06	± 1,5 mm		
.XX	± .03	± 76 mm		
.XXX	± .010	± 254 mm		
FRACT.	± 1/16	± N/A		
ANGLES	± 1/2°	± 1/2°		

ENG	MFM	DATE 8/26/11
DWN	MFM	DATE 8/26/11
CHK	MFM	DATE 8/26/11

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

Thermo Fisher SCIENTIFIC

FIELD WIRING DRAWING
COMMUNICATION BOARD
MICRO–TECH 9000

PART NO	DRAWING NUMBER	REV
	C07392B–E017	A

Derived From C07361B–Y001_12

6 5 4 3 2 1

D C B A

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC

NOTES: READ ALL INSTRUCTIONS BEFORE WIRING SYSTEM

1. DO NOT ALTER LENGTH OF CABLE SUPPLIED WITH LOADCELL.

2. USE BELDEN 8407 OR EQUIVALENT, 4 CONDUCTOR, 16 AWG, SHIELDED IF TOTAL LENGTH IS 200 FEET OR LESS.

   USE BELDEN 9260 OR EQUIVALENT, 6 CONDUCTOR, 20 AWG, SHIELDED IF TOTAL LENGTH IS 201 TO 3,000 FEET. SENSE CONNECTIONS ARE REQUIRED IF TOTAL LENGTH IS OVER 200 FEET.

3. SPEED SENSOR CABLE 60–12C – THE 60–12C DOES NOT REQUIRE EXTERNAL POWER. USE BELDEN 8760 OR EQUIVALENT, 2 CONDUCTOR, 18 AWG, SHIELDED IF TOTAL IS 200 FEET OR LESS. USE BELDEN 8780, 2 CONDUCTOR, 16 AWG, SHIELDED IF TOTAL LENGTH IS 201 TO 3,000 FEET.

   SPEED SENSOR 60–12F – USE BELDEN 8772 OR EQUIVALENT, 3 CONDUCTOR, 20 AWG, SHIELDED. MAXIMUM DISTANCE IS 200 FEET.

4. DO NOT RUN SIGNAL, LOADCELL, OR SPEED SENSOR CABLES IN SAME CONDUIT AS POWER WIRING. CONNECT SHIELDS ONLY WHERE SHOWN.

5. INPUT POWER REQUIREMENTS
   FIELD MOUNT 100 TO 240 VAC, 50–60HZ, 1/2 AMP
   PANEL MOUNT 24VDC, +10%, –15% (USER SUPPLIED), (50VA MAXIMUM LOAD)

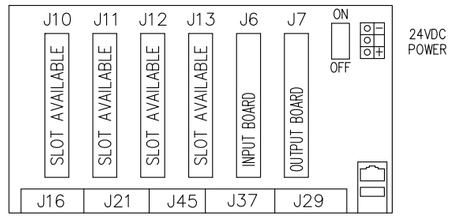
6. EARTH GROUND ALL ELECTRICAL ENCLOSURES.

7. ALL WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL LOCAL CODES. ALL WIRING, EXCEPT AS NOTED, IS THE RESPONSIBILITY OF THE CUSTOMER. FOR INPUT POWER USE 14 AWG STRANDED WIRE.

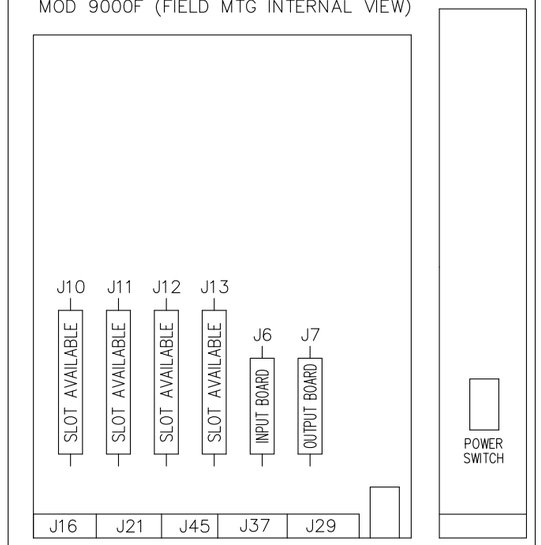
8. CONNECT SHIELDS ONLY AS SHOWN.
   CABLE TYPE: BELDEN 8760 OR EQUIVALENT.

9. FOR FIELD MOUNT VERSION ONLY: AN EXTERNAL BIPOLAR LINK SWITCH (CSA–UL) MUST BE PROVIDED AT INSTALLATION TIME (115 VAC OR 230 VDC, 5A) WITH MAGNETHERMAL SWITCH NOMINAL CURRENT 16 AMP. MAX DISTANCE FORM INSTRUMENT 5 FT [1.5 M]. THIS DISCONNECT DEVICE SHOULD BE IN EASY REACH OF THE OPERATOR AND IT MUST BE MARKED AS THE DISCONNECTING DEVICE FOR THE EQUIPMENT.

MOD 9000P (PANEL MTG BACK VIEW)



MOD 9000F (FIELD MTG INTERNAL VIEW)



TERMINALS – BOARD SLOT POSITION

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
B	3013		CORRECTED FIELD MNT VOLTS AND FREQUENCY	9/21/12	PEP / TMN
A	2959		RELEASED	6/6/12	PEP / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE					
X	±	.1	± 3 mm	ENG MFM	DATE 8/26/11
.X	±	.06	±1.5 mm	DWN MFM	DATE 8/26/11
.XX	±	.03	±76 mm	CHK MFM	DATE 8/26/11
.XXX	±	.010	±254 mm		
FRACT.	±	1/16	± N/A		
ANGLES	±	1/2°	± 1/2°		

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

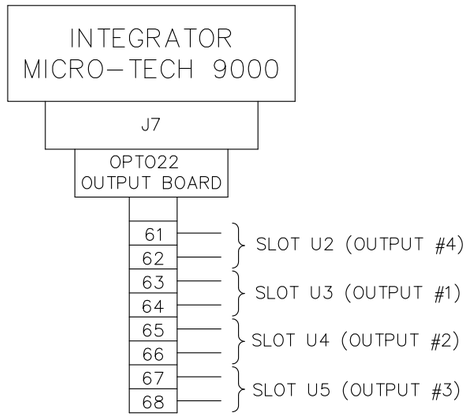
Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
NOTES
MICRO–TECH 9000

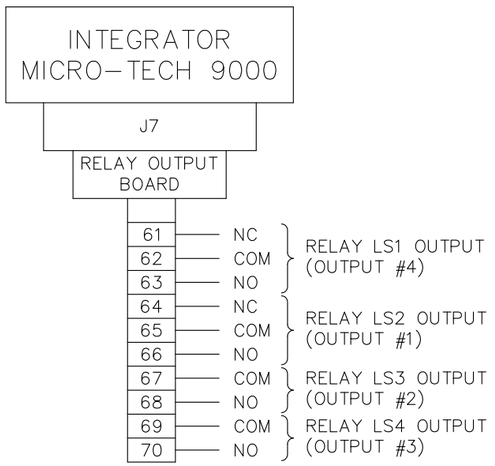
PART NO	DRAWING NUMBER	REV
	C07392B–E018	B

Derived From D07361B–Y001_01

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



OPTO–22 MODULES
24–280VAC P/N 037289
5–60VDC P/N 039669
DRY (REED) P/N 044552



RELAYS RATED:
PANEL VERSION:
33 VAC AT 2 AMP
70 VDC AT .5 AMP

FIELD VERSION:
240 VAC AT 3 AMP
70 VDC AT .5 AMP

NOTES: READ ALL INSTRUCTIONS BEFORE WIRING SYSTEM

1. DO NOT RUN SIGNAL, LOADCELL OR SPEED SENSOR CABLES IN SAME CONDUIT AS ALARM WIRING.
2. ALL WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL LOCAL CODES. ALL WIRING, EXCEPT AS NOTED, IS THE RESPONSIBILITY OF THE CUSTOMER.
3. OUTPUT FUNCTIONS ASSIGNED BY USER, SEE O & S MANUAL.
4. INSTALL IN SLOT J7.
5. USE UL 1015 WIRE, 16 AWG [1 SQ.mm] OR SMALLER.
6. WHEN SOURCING POWER FOR THE AC OUTPUTS/INPUTS FROM THE MICRO–TECH, SOURCE THE POWER FROM THE AUXILLARY POWER OUT (AUX PWR OUT) TERMINAL.

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
B	3027		ADDED NOTES 5 & 6	11/6/12	PEP / TMN
A	2959		RELEASED	6/6/12	RAE / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE					
X	± .1	± 3 mm	ENG MFM	DATE 8/26/11	
.X	± .06	± 1.5 mm	DWN MFM	DATE 8/26/11	
.XX	± .03	± .76 mm	CHK MFM	DATE 8/26/11	
.XXX	± .010	± .254 mm			
FRACT.	± 1/16	± N/A			
ANGLES	± 1/2°	± 1/2°			

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

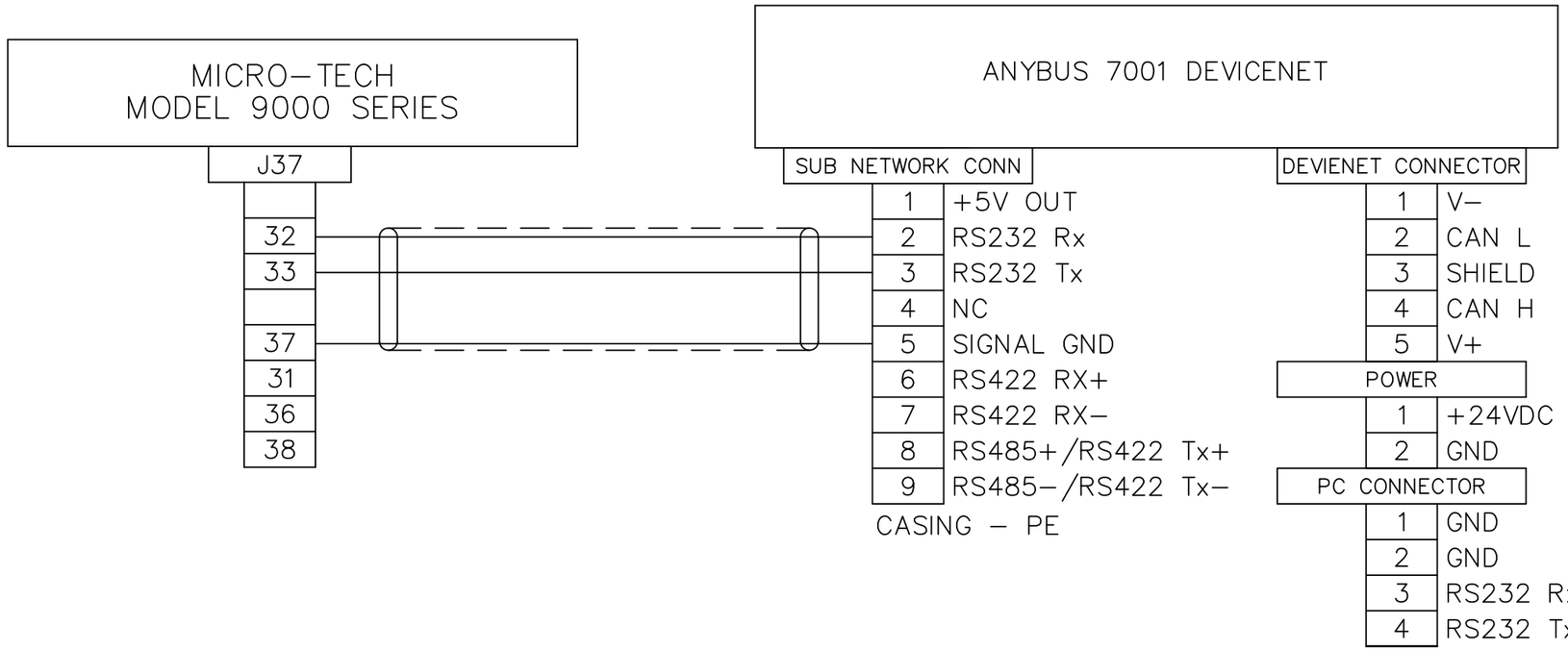
Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
DIGITAL OUTPUT BOARDS
MICRO–TECH 9000

PART NO	DRAWING NUMBER	REV
	C07392B–E021	B

Derived From B07361B–Y001_06

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
A	2959		RELEASED	6/6/12	RAE / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE

X	± .1	± 3 mm		
.X	± .06	± 1.5 mm		
.XX	± .03	± .76 mm		
.XXX	± .010	± .254 mm		
FRACT.	± 1/16	± N/A		
ANGLES	± 1/2°	± 1/2°		

ENG	MFM	DATE 4/10/12
DWN	RAE	DATE 4/10/12
CHK	MFM	DATE 4/10/12

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
ANYBUS COMMUNICATOR
FOR DEVICE NET
MICRO–TECH 9000

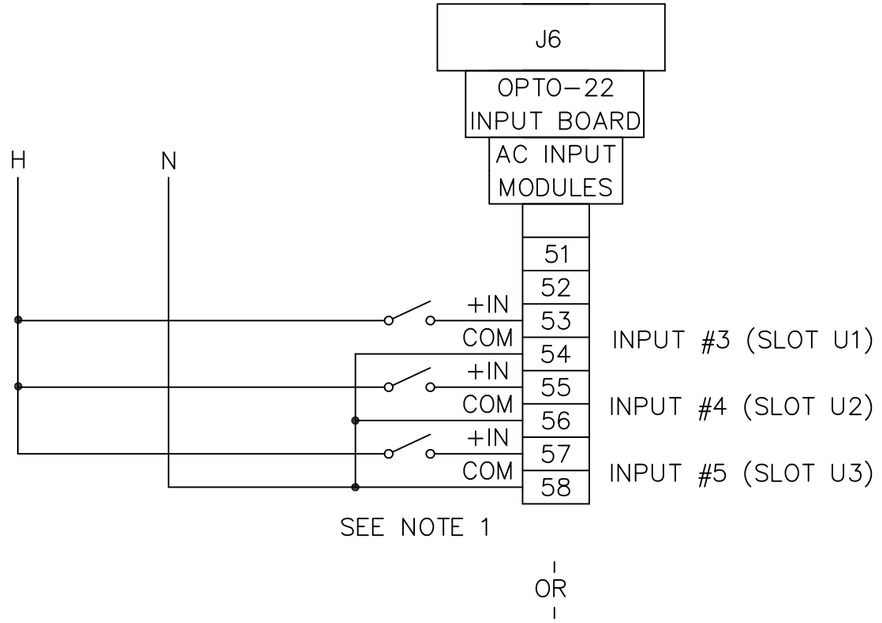
PART NO	DRAWING NUMBER	REV
	B07392B–E022	A

Derived From B07361B–Y001_13

4 3 2 1

B A

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



NOTES:
1. USE UL 1015 WIRE, 16AWG [1 SQ.mm] OR SMALLER.
2. WHEN SOURCING POWER FOR THE AC OUTPUTS/INPUTS FROM THE MICRO–TECH, SOURCE THE POWER FROM THE AUXILLARY POWER OUT (AUX PWR OUT) TERMINAL.

DIGITAL INPUTS
TYPE: CURRENT SOURCING TO COMMON GROUND:
DESIGNED FOR DRY CONTACT INPUT.
RATING: 24 VDC, 5 mA TYPICAL
INPUT FUNCTION IS ASSIGNED BY
USER; SEE OPERATOR MANUAL

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
B	3027		ADDED NOTE 2. ADD SLOT NAME FOR OPTO22 BD	11/6/12	PEP / MFM
A	2959		RELEASED	6/6/12	RAE / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A
JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE

X	± .1	± 3 mm
.X	± .06	± 1.5 mm
.XX	± .03	± .76 mm
.XXX	± .010	± .254 mm
FRACT.	± 1/16	± N/A
ANGLES	± 1/2°	± 1/2°

ENG	MFM	8/26/11
DWN	MFM	8/26/11
CHK	MFM	8/26/11

NEXT ASS'Y
CUST ORDER NO
CUSTOMER LOCATION
USER LOCATION

Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
DC INPUT & OPTO–22 INPUT BOARDS
MICRO–TECH 9000

PART NO	DRAWING NUMBER	REV
	B07392B–E025	B

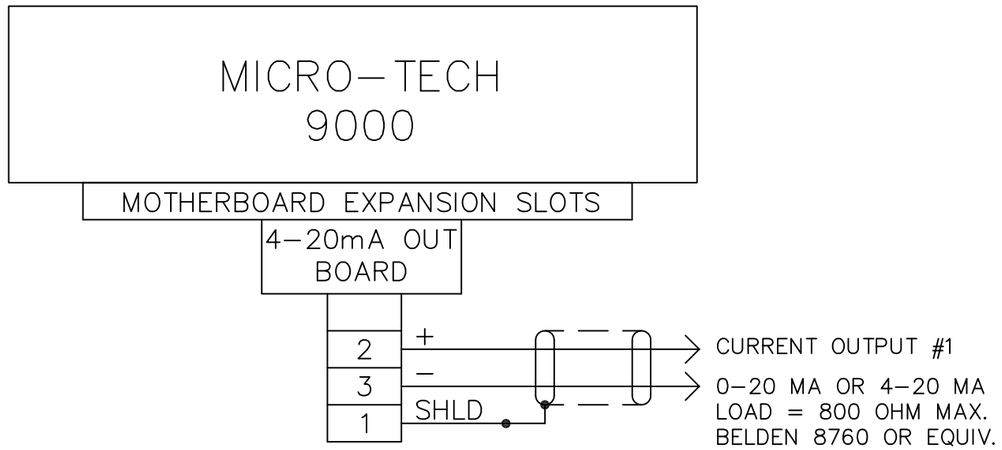
Derived From B07361B–E006

4 3 2 1

B

A

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



NOTES:

1. DO NOT RUN ANALOG SIGNAL CABLES IN SAME CONDUIT AS POWER WIRING. CONNECT SHIELDS ONLY WHERE SHOWN.
2. ALL WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL LOCAL CODES. ALL WIRING, EXCEPT AS NOTED, IS THE RESPONSIBILITY OF THE CUSTOMER.
3. INSTALL IN ONE OF THE MOTHERBOARD EXPANSION SLOTS J10–J13.
4. CABLE TYPE: USE BELDEN 8760 OR EQUIVALENT

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
B	3027		ADDED NOTES.	11/7/12	PEP / MFM
A	2959		RELEASED	6/6/12	RAE / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE		
X	± .1	± 3 mm
.X	± .06	± 1.5 mm
.XX	± .03	± .76 mm
.XXX	± .010	± .254 mm
FRACT.	± 1/16	± N/A
ANGLES	± 1/2°	± 1/2°

ENG	MFM	DATE 8/26/11
DWN	MFM	DATE 8/26/11
CHK	MFM	DATE 8/26/11

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
4–20mA OUT BOARD
MICRO–TECH 9000

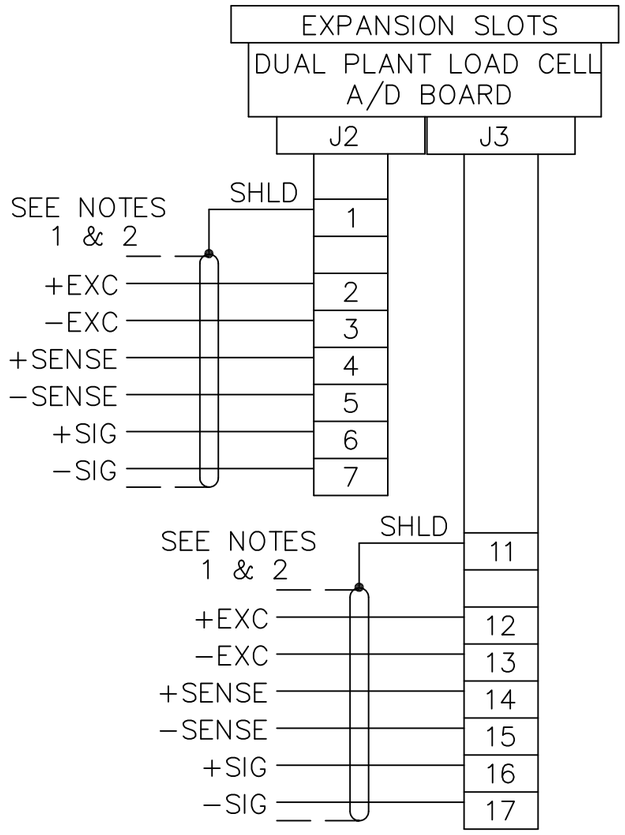
PART NO	DRAWING NUMBER	REV
	B07392B–E026	B

Derived From B07361B–E006

4 3 2 1

B A

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



NOTES:

1. USE BELDEN 8407 (P/N 003727) OR EQUIVALENT, 4 CONDUCTOR, 16 AWG, SHIELDED, IF TOTAL CABLE RUN IS LESS THAN 200 FT (61 M). USE BELDEN 9260 (P/N 011416) OR EQUIVALENT, 6 CONDUCTOR, 20 AWG, SHIELDED, IF TOTAL CABLE IS 200 TO 3,000 FT (61−915 M). SENSE CONNECTIONS ARE REQUIRED IF TOTAL LENGTH IS OVER 200 FEET. INSTALL JUMPERS IN JUNCTION BOX AS SHOWN, OR IF USING 4 CONDUCTOR CABLE JUMPER TB1 2 TO 4 AND TB1 3 TO 5. OR IF USING 4 CONDUCTOR CABLE JUMPER TB2 12 TO 14 AND TB2 13 TO 15.

2. DO NOT RUN SIGNAL, LOADCELL, OR SPEED SENSOR CABLES IN SAME CONDUIT AS POWER WIRING. CONNECT SHIELDS ONLY WHERE SHOWN.

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
A	2959		RELEASED	6/6/12	RAE / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED			OTHERWISE		
X	±	.1	±	3 mm	
.X	±	.06	±	1.5 mm	
.XX	±	.03	±	.76 mm	
.XXX	±	.010	±	.254 mm	
FRACT.	±	1/16	±	N/A	
ANGLES	±	1/2°	±	1/2°	

ENG	MFM	DATE 8/26/11
DWN	MFM	DATE 8/26/11
CHK	MFM	DATE 8/26/11

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

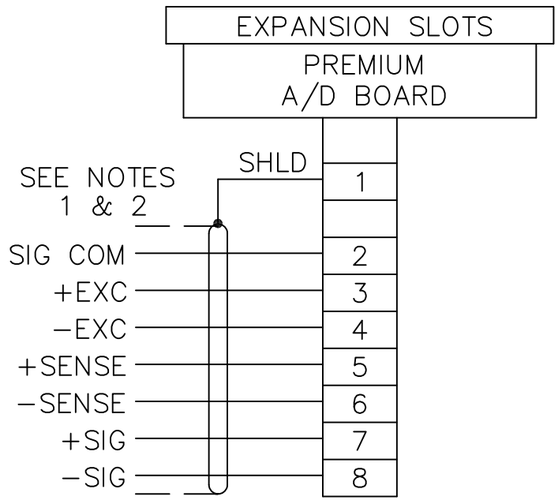
Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
DUAL PLANT LOAD CELL A/D BOARD
MICRO−TECH 9000

PART NO	DRAWING NUMBER	REV
	B07392B−E027	A

Derived From B07361B−E006

ITEM	PART NO	QTY	DESCRIPTION	DWG NO/SPEC



NOTES:

1. USE BELDEN 8407 (P/N 003727) OR EQUIVALENT, 4 CONDUCTOR, 16 AWG, SHIELDED, IF TOTAL CABLE RUN IS LESS THAN 200 FT (61 M). USE BELDEN 9260 (P/N 011416) OR EQUIVALENT, 6 CONDUCTOR, 20 AWG, SHIELDED, IF TOTAL CABLE IS 200 TO 3,000 FT (61−915 M). SENSE CONNECTIONS ARE REQUIRED IF TOTAL LENGTH IS OVER 200 FEET. INSTALL JUMPERS IN JUNCTION BOX AS SHOWN, OR IF USING 4 CONDUCTOR CABLE JUMPER J9 3 TO 5 AND J9 4 TO 6.

2. DO NOT RUN SIGNAL, LOADCELL, OR SPEED SENSOR CABLES IN SAME CONDUIT AS POWER WIRING. CONNECT SHIELDS ONLY WHERE SHOWN.

CADD DATABASE: AUTOCAD

REV	ECO NO	MICRO	DESCRIPTION	DATE	BY / APPD
A	2959		RELEASED	6/6/12	RAE / MFM

DO NOT SCALE DWG
REMOVE ALL BURRS AND UNNECESSARY SHARP EDGES

SCALE N/A

JOB NO

TOLERANCE UNLESS SPECIFIED OTHERWISE			ENG	DATE
X	± .1	± 3 mm	MFM	8/26/11
.X	± .06	± 1.5 mm	DWN MFM	DATE 8/26/11
.XX	± .03	± .76 mm		
.XXX	± .010	± .254 mm	CHK MFM	DATE 8/26/11
FRACT.	± 1/16	± N/A		
ANGLES	± 1/2°	± 1/2°		

NEXT ASS'Y

CUST ORDER NO

CUSTOMER LOCATION

USER LOCATION

Thermo Fisher SCIENTIFIC

FIELD WIRING DIAGRAM
PREMIUM A/D BOARD
MICRO−TECH 9000

PART NO	DRAWING NUMBER	REV
	B07392B−E028	A

Derived From B07361B−E006

4 3 2 1

B A