



USER'S HANDBOOK

SPEED INDICATOR WITH ADJUSTABLE OVERSPEED, MODEL Q1810

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TELEPHONE: (502) 618-8800
FAX: (502) 618-8810
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WEB SITE: <http://www.rail-automation.com/>

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939 S. MAIN STREET
MARION, KENTUCKY 42064
TELEPHONE: (270) 918-7800
CUSTOMER SERVICE: (800) 626-2710
TECHNICAL SUPPORT: (800) 793-7233
FAX: (270) 918-7830

FCC RULES COMPLIANCE

The equipment covered in this manual has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

NOTES, CAUTIONS, AND WARNINGS

Throughout this manual, notes, cautions, and warnings are frequently used to direct the reader's attention to specific information. Use of the three terms is defined as follows:

WARNING

WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY. WARNINGS ALWAYS TAKE PRECEDENCE OVER NOTES, CAUTIONS, AND ALL OTHER INFORMATION.

CAUTION

CAUTION

REFERS TO PROPER PROCEDURES OR PRACTICES WHICH IF NOT STRICTLY OBSERVED, COULD RESULT IN A POTENTIALLY HAZARDOUS SITUATION AND/OR POSSIBLE DAMAGE TO EQUIPMENT. CAUTIONS TAKE PRECEDENCE OVER NOTES AND ALL OTHER INFORMATION, EXCEPT WARNINGS.

NOTE

NOTE

Generally used to highlight certain information relating to the topic under discussion.

If there are any questions, contact Siemens Industry Inc., Rail Automation Application Engineering.

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REVISION HISTORY

Rev.	Date	Author	Description
A	12/1809	DLW	Initial release under Change Notice (rebranding and format, no technical information changed)
A.1	06/2014	TP	Change to Siemens Branding

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1.0 INTRODUCTION

The Siemens Q1810 Speed Indicator incorporates two digital speed-indicating displays for the Engineer and Conductor, an odometer, and an accelerometer. The Speed Indicator provides each crewmember with a speed indication directed toward their normal cab position, thereby using minimum cab space and providing each crewmember with vital train operating information.

The Q1810 Speed Indicator automatically provides two speed display ranges. Speeds below 10 MPH are displayed in miles and tenths of miles, and speeds above 10 MPH are displayed in whole miles. This allows for accurate slow speed train movement, as well as line-of-road speed indications.

The seven-segment LED display and microprocessor technology provide reliable speed indications with an accuracy that exceeds the FRA requirements.

Additionally, the Siemens Q1810 Speed Indicator can operate from two types of electrical/electronic axle drives: either 20 pulses per revolution or 60 pulses per revolution.

1.1 FEATURES OF THE Q1810 SPEED INDICATOR

- Dual Speed Display – The dual speed display of the Q1810 can show a range of 0 - 199 MPH. Km/h instead of MPH is also available.
- Overspeed Circuit – The Speed Indicator controls an overspeed circuit that provides an output to a magnet valve (Salem SA-816 or equivalent) when the speed of the locomotive matches or exceeds the overspeed setting of the Speed Indicator. Once the locomotive speed has reached the overspeed set point and has remained at or above that point for 5 seconds, the overspeed circuit will be de-energized. The overspeed point is adjustable from 5 MPH to 120 MPH.
- Odometer – The odometer will increment and decrement based on the direction of the locomotive. True net distance can be obtained from any locomotive movement. The four and a half digit odometer displays readings in the range +/-19,999 feet in one-foot increments.
- Accelerometer – The accelerometer display will report positive or negative acceleration in the range 0.0 to +/-99.9 MPH/min, with changes in 1/10 MPH/min increments.
- Compatibility – The Q1810 Speed Indicator is a direct replacement for existing speed indicators. The mounting pattern and cable arrangement allows for a bolt-for-bolt, pin-for-pin replacement of existing analog or electronic speed indicators.
- Dimmer Control – Four-position dimmer control is included for ease of reading in any ambient lighting condition.
- Wheel Size – Wheel size is adjustable in ½ inch increments. The measurement of the wheel diameter is entered directly into the Speed Indicator.



Figure 1-1 Q1810 Speed Indicator

2.0 PARTS LIST

The following lists all components available from Siemens for the installation, interconnection, and servicing of the Q1810 Speed Indicator. Note that some parts (such as cables) may be "instead of" rather than "in addition to." A drawing of cable orientations a, b, c, d, and e is included at the end of this list.

Part Number	Quantity	Description
Q1810	1	Speed Indicator with Adjustable Overspeed
Q9011/XXC	1	Power/Locomotive Interconnection Cable for 20 Pole Axle Drives XX designates the cable length, in feet C indicates 90° cable connector orientation (a, b, c, d, or e)
Q9012/XXC	1	Power/Locomotive Interconnection Cable for 60 Pole Axle Drives XX designates the cable length, in feet C indicates 90° cable connector orientation (a, b, c, d, or e)
Q1123	1	Siemens 20 Pole Axle Drive
Q1163	1	Siemens 60 Pole Axle Drive
QP-35040	1	Magnet Valve (72 volts)
QP-52170	1	Axle Drive Paddle and Bushing Assembly, 10" installed length
QP-52171	1	Axle Drive Paddle and Bushing Assembly, 7.5" installed length
QP-52272	1	Axle Drive "Peg Drive Adapter", 2.44" installed length
QP-07030	*	Overspeed and wheel size adjustment key
OBE-00-09-17	*	Service Manual (this manual)

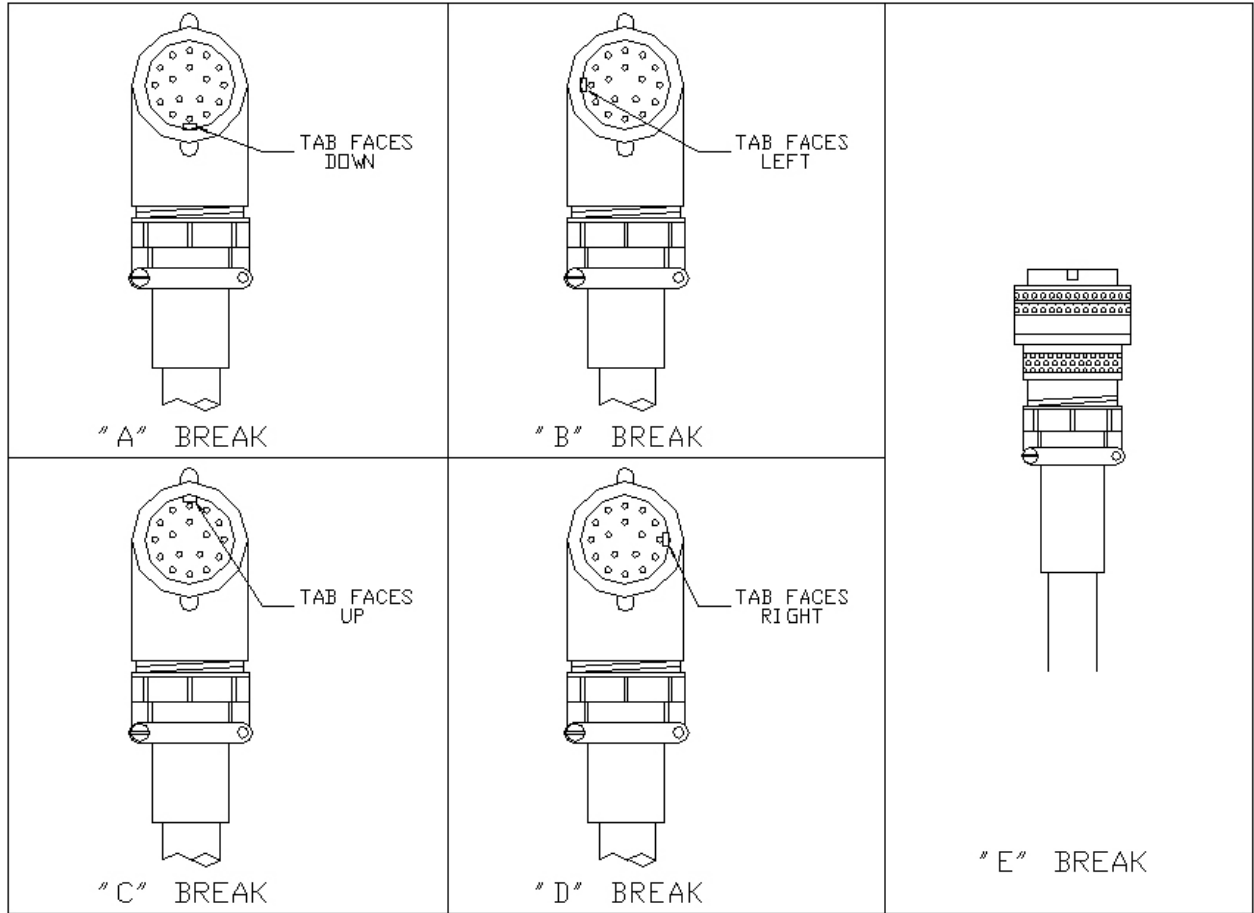


Figure 2-1 Cable Orientation

3.0 INSTALLATION

3.1 MECHANICAL

Mechanical installation of the Q1810 Speed Indicator consists of the attachment of the mounting feet to the top of the locomotive control stand or wall mounting bracket. Four 5/16" diameter mounting holes are provided for mounting the Speed Indicator. To replace older analog meters, no modification is required.

3.2 ELECTRICAL

Refer to the installation drawing, located in the Drawings Section of this manual, for details concerning electrical connections. Electrical installation consists of the power, axle alternator, reverser inputs, and the overspeed magnet valve output, if used. On many locomotives, the existing cable may be used.

3.3 PNEUMATIC

Pneumatic installation consists of mounting a magnet valve, QP-35040 or Salem SA-816 (or equivalent), on the locomotive and piping the magnet valve to the #3 port of the P2A penalty application valve. A tubing diameter of 3/8" OD is recommended to ensure rapid venting of the P2A valve.

4.0 CONFIGURATION

4.1 DISPLAY ILLUMINATION ADJUSTMENT

To change the brightness level of the display, press the **DIM** button. The illumination adjustment works in a circular fashion: each press of the **DIM** button will reduce the brightness of all displays until the lowest setting is reached, and then the next press will return the brightness to the highest setting. Example: Bright -> High -> Med -> Low -> Bright -> etc.

4.2 OVERSPEED SET POINT ADJUSTMENT

To adjust the over-speed setting of the Q1810 Speed Indicator:

- Ensure the locomotive speed is 0 MPH.
- Press and hold the **DIM** button for 10 seconds. The Engineer's display will show the current overspeed setting in MPH, and the odometer display will show "OSPd" to signify that the Speed Indicator is in the "overspeed set-point" display mode.
- While still keeping the **DIM** button pressed, turn the key in the key switch provided on the back of the Speed Indicator. Once the key switch has been turned, the Indicator is placed in the OVERSPEED SET mode. Release the **DIM** button.
- Press the **DIM** button to decrease the overspeed set-point, and press the **COUNT** button to increase the over-speed set-point. Changes to the overspeed set-point are made in 1 MPH increments with each press of **DIM** or **COUNT**.

NOTE

NOTE

Holding the **DIM** or **COUNT** buttons pressed results in the over-speed setting being scrolled quickly.

- Once the desired overspeed setting is shown on the display, return the key switch to the normal position and remove the key. The new overspeed setting is stored in non-volatile memory and will remain the overspeed setting until it is changed again using this procedure.
- To verify the new overspeed setting, confirm that the locomotive is still stopped. Press and hold the **DIM** button for 10 seconds. The Engineer's display will show the current overspeed setting in MPH.

4.3 WHEEL SIZE ADJUSTMENT

4.3.1 Measurement Display

To check the wheel size stored in the Speed Indicator, turn the key in the key switch provided on the back of the Speed Indicator. The Engineer's display will report the wheel diameter setting.

4.3.2 Adjustment

- Ensure the locomotive is stopped.
- Measure the wheel diameter of the wheel connected to the axle drive that the Speed Indicator uses.
- Insert the key into the key switch provided on the back of the speed indicator and turn the key. The current wheel setting will be displayed in the Engineer's speed display. The odometer will display "dIA" to signify that the Speed Indicator is in the wheel size adjustment mode.
- Modify the wheel setting by pressing either the **DIM** or **COUNT** button. Each time the **DIM** button is pressed, the wheel diameter setting will decrement by half an inch. Each time the **COUNT** button is pressed, the wheel diameter setting will increment by half an inch.

NOTE

NOTE

Holding the **DIM** or **COUNT** button pressed results in the wheel size setting being scrolled quickly

- When the desired wheel diameter is displayed, turn the key switch to the normal position and remove the key. The new wheel size setting is stored in non-volatile memory and will remain the wheel size setting until it is changed again by this procedure.
- The wheel size setting can be confirmed during the power-up self-test, found in the Functional Testing Section of this manual.

5.0 OPERATION

5.1 ACCELEROMETER

The normal operation of the accelerometer/odometer display is in the accelerometer mode. Any acceleration/deceleration of the locomotive will be shown on this display in 1/10th MPH/min increments. As an example, if the display shows -14.5 MPH/min, it indicates that the locomotive speed is decreasing by 14.5 miles per hour per minute. At this deceleration rate, if the locomotive were traveling 29 MPH, it would take two minutes for the locomotive to reach 0 MPH. Similarly, if the accelerometer read +12.0 MPH/min, it would take one minute for the locomotive to increase its speed by 12 miles per hour. Whenever the odometer is used, the accelerometer display will be replaced by the odometer reading.

5.2 ODOMETER

To use the odometer, perform the following operations:

- Place the locomotive reverser in either the forward or reverse position

NOTE

NOTE

If the locomotive is moved before selecting the direction of the locomotive with the reverser, the odometer display will automatically switch to the accelerometer mode.

- Press the **COUNT-HOLD-DONE** button once. The display will show the current state of the odometer (0 feet if not moving).

NOTE

NOTE

Once movement commences, the elapsed distance will be displayed as a positive distance, regardless of the reverser position. When a movement that is opposite to the start of movement is performed, the distance will decrement in a similar fashion

- To freeze the odometer display, press the **COUNT-HOLD-DONE** button once. The odometer will cease counting and will flash the display.
- To turn off the odometer from a frozen odometer display, press the **COUNT-HOLD-DONE** button once. If the odometer display is not currently frozen, press the **COUNT-HOLD-DONE** button twice to exit the odometer mode. The odometer/accelerometer display will return to its normal accelerometer function.

NOTE

NOTE

After +/- 19,999 feet, the odometer display will blink, indicating an over-range condition.

6.0 FUNCTIONAL TESTING

6.1 POWER-UP SELF-TEST OPERATION

During the Speed Indicator power-up, diagnostic checks are made of the electronics and the speed indicator program memory. The digital displays on the Speed Indicator are used to show the following information.

NOTE

NOTE

The Conductor's speed display will not illuminate until the power-up self-test is complete.

<u>Information Displayed</u>	<u>Display Location</u>	<u>Display Duration</u>
Software Version (1-19)	Engineer's Speed Display	3 Seconds
Axle Drive Type (20 or 60)	Accelerometer Display	3 Seconds
Wheel Size (1/2" increments)	Engineer's Speed Display	3 Seconds
Overspeed Setting	Engineer's Speed Display	See Note below

The Speed Indicator will "ramp" the speed display from 5 MPH below the overspeed setting up to the overspeed setting and then flash the overspeed setting for 30 seconds. While the overspeed setting is displayed, the user may press either of the buttons located on the front of the Speed Indicator. This will cause the OVERSPEED magnet valve to de-energize for 5 seconds to test the overspeed penalty brake application system. After 30 seconds has elapsed or one of the buttons has been pressed to test the OVERSPEED magnet valve, the Indicator enters the "run" mode of operation.

NOTE

NOTE

If a speed signal is detected at power-up, the speed indicator will immediately enter the run mode and bypass the power-up operations.

6.2 LED TEST MODE

To test all LED displays, turn power off to the Speed Indicator. Press and hold the **DIM** button and return power to the Speed Indicator. The Indicator will automatically step through a test of all display segments and then return to the normal operating mode when finished (approximately 30 seconds).

7.0 MAINTENANCE

The Q1810 Speed Indicator does not require periodic maintenance for any internal components. There are no user-serviceable parts internal to the Speed Indicator housing. Periodic inspection of the overspeed setting/function and adjustment of the wheel diameter setting should be performed during scheduled locomotive maintenance intervals.

If the Q1810 requires repair, reference the Warranty and Repair Section of this manual regarding the return of equipment to Siemens for service.

8.0 WARRANTY AND REPAIR

To obtain expedited warranty claim service, expedited repair service, or if special shipping arrangements are required for the return of any Siemens Rail Automation product, please contact Siemens Industry, Inc. to obtain a Return Material Authorization (RMA#)

8.1 WARRANTY POLICY

All Siemens Rail Automation equipment, excluding credit card memory or other similar devices that already carry a manufacturers warranty, is warranted against failure, due to materials or workmanship, for a period of two (2) years commencing on the month of manufacture. Replacement parts are warranted for a period of one (1) year, excluding customer-supplied material. Siemens will repair or replace, at our discretion, all defective material returned to our factory in Marion, Kentucky, prepaid. The equipment will be fully repaired and tested to the original equipment specifications. Equipment will be returned at the equipment owners' expense with the existing warranty in effect.

To determine the initiation of the warranty period for Siemens equipment, reference the example as illustrated below.

Serial Number Code	(Z)YYMMXXXX
(Z)	2 if unit was manufactured after December 31, 1999
YY	Year of manufacture, applicable to all Siemens products
MM	Month of manufacture, applicable to all Siemens products
XXXX	Sequential manufacturing reference assigned by Siemens

Example: 203049876
Unit Manufactured in April 2003 – Warranty expires April 2005.

8.2 REPAIR POLICY

Equipment must be shipped to the address listed below. Equipment which has exceeded the warranty period must be shipped freight pre-paid to our factory, unless other arrangements have been previously negotiated. Repair charges will be estimated and charged upon determination of the extent of damage, current costs of parts, and labor. Return shipping is the responsibility of the equipment owner and will be charged accordingly.

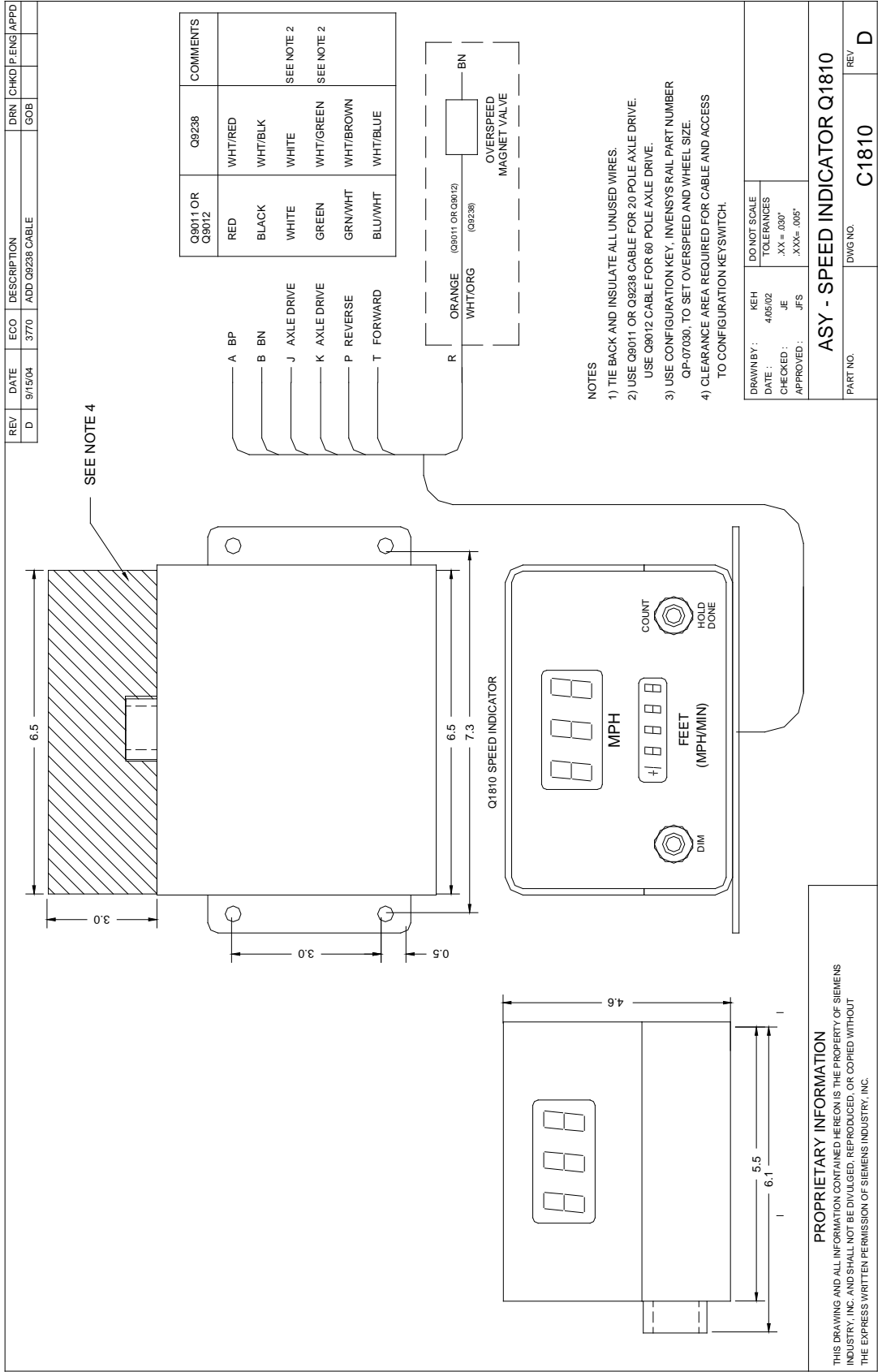
Return all equipment to:

Siemens Industry, Inc.
Rail Automation
Field Repair Department
939 S. Main St
Marion, KY 42064, USA

9.0 DRAWINGS

The following lists all applicable drawings and their corresponding revision levels for the Siemens Q1810 Speed Indicator. These drawings are included in this manual.

<u>Drawing</u>	<u>Description</u>	<u>Revision</u>
C1810	Assembly – Speed Indicator Q1810	D



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