This document set is applicable to the following part number configurations:

Tachometer systems

Part Number	Kit Configuration	
	Instrument	**Sensors**
TM200	TM200	-
TM200B	TM200	1 X A200-HMB
TM200S	TM200	1 X A200-HMS

TM200X Tachometer

THIS IS A TRANSPORT CANADA APPROVED MANUAL

The following checklist outlines the required articles for all TM200X series part numbers.

	Documentation	**Document Number**
☐	Introduction (this document)	S200-TM200X-001
☐	Warranty Statement	S200-AWS
☐	Installation Instructions	S200-TM200X-002
☐	Intensity Control Installation Options	S200-DDC-INST
☐	Wiring and Installation Schematic	S200-TM200X-003
☐	Human Interface Definition	S200-HID
☐	Instrument Setup	S200-TM200X-004
☐	Operations Guide	S200-TM200X-005
☐	Product Specifications	S200-TM200X-006
☐	Installation Compliance	S200-TM200X-007
☐	Instructions for Continued Airworthiness	S200-ICA
☐	Flight Manual Supplement	S200-FMS
☐	Authorized Release Certificate	TCCA 24-0078
☐	Permission to Use STC	S200-PTU
☐	Canadian STC and Eligibility List	STC & S200-CEL
☐	FAA STC and Approved Model List	STC & S200-AML

Components

☐   TM200 Instrument

☐   A200-HMB Hall Effect Rotational Speed Sensor for Bendix Magneto

☐   A200-HMS Hall Effect Rotational Speed Sensor for Slick Magneto

☐   4 X Mounting Screws

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TM200X Tachometer

The Fastest Way To Install And Start Using This Product

NOTE: *This product is certified as a primary replacement, new or secondary instrument only when installation is performed in accordance with the documented instructions and procedures.*

1. Review the Warranty Statement before performing any tasks. Do not remove the instrument from the sealed package until you agree with the stated terms.

2. If this instrument is to be installed in a certified aircraft, verify that the aircraft model is listed on the Eligibility List (Canadian registered aircraft) or the Approved Model List (USA and all other countries).

    If it is NOT listed, contact your local authority and obtain the necessary requirements or approvals before proceeding further.

    For all other vehicles, including experimental aircraft continue with Step 3.

3. Follow the Installation Instructions exactly as noted, referring to the Wiring Diagram as and when required. Note: The installation process has been optimized based on the sequence of components to be installed. Installing the product in any other way will, in all likelihood, take longer and be more complex.

    Ensure that **one** of the Intensity Control options has been installed in accordance with document # S200-DDC-INST.

4. Perform the Instrument Setup using the required data as listed in the Instrument Setup procedure.

5. Validate that all functions perform as outlined in the Operations Guide.

6. Complete all regulatory documentation, if required.

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NO NONSENSE WARRANTY

Our warranty policy is simple …. It is even written in plain English!

Please read it BEFORE DOING ANYTHING WITH YOUR NEW INSTRUMENT!

If you require technical support when installing your instrument please call our Technical Support department directly on
416-628-0725

We will:

- Repair or replace (at our discretion) any instrument which becomes defective within a period of 12 (twelve) months of manufacture date. You will pay for the shipping costs to return the instrument to us and we will pay for the shipping costs to return the instrument to you;

- Replace all instruments that fail out of warranty for a flat rate of 50% of the cost of a new instrument, at the time of the failure.

We are not:

- Liable for any costs associated with the installation or removal of any of our instruments, irrespective of the cause;

- Liable for any misuse or non-use of the instrument in whatever form.

We will not:

- Repair or replace your instrument free of charge, under warranty, if it has not been installed by an appropriately licensed person.

If you do not agree with ANY of the above statements, return your new instrument to us immediately for a FULL refund LESS shipping costs.

ALL RETURNS REQUIRE RETURN MATERIAL AUHORIZATIONS (RMA). WE DO NOT ACCEPT RETURNS WITHOUT RMA NUMBERS. CALL 416-628-0725 FOR AUTHORIZATION.

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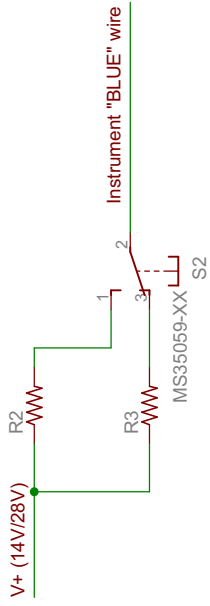Tel. 416-628-0725 | www.aerospacelogic.com | Fax. 416-352-5854

Document # S200-AWS
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TM200X Installation Instructions

1. Sensor Installation:
   a. For Bendix type magnetos install hall effect sensor P/N A200-HMB, or
   b. For Slick/Unison type magnetos install hall effect sensor P/N A200-HMS,
   c. in accordance with the manufacturer supplied instructions for these sensors.

2. Connect the wiring supplied with the DB25 interface connector in accordance with the TM200X Wiring and Installation Schematic. **DO NOT ATTACH THE CONNECTOR TO THE INSTRUMENT UNTIL ALL WIRING HAS BEEN CONNECTED.**

3. Select the instrument location in the aircraft panel.

4. Ensure that the aircraft master switch and/or power to the instrument is **OFF**.

5. Attach the DB25 connector to the instrument. Ensure that the plug is fully inserted into the instrument. Finger tighten the two plug locking screws, then tighten 1/8 turn using a screwdriver. **DO NOT OVERTIGHTEN.**

6. If the instrument is to be installed to the right of the pilot's field of view, the DB25 connector on the rear of the instrument **MUST be closest to the bottom** of the instrument panel. Proceed with step 8.

7. If the instrument is to be installed in front of or to the left of the pilot's field of view the DB25 connector on the rear of the instrument **MUST be closest to the top** of the instrument panel.

8. Install the instrument in the panel, attaching with four 6-32 X 3/8" screws.

9. Initial Power Up Sequence:

   a. Adjust the instrument intensity control for maximum intensity.
   b. Apply power to the instrument.
   c. The instrument display will light up.
   d. The display may be inverted at this point. Ignore the orientation at this time.
   e. Turn the instrument **OFF**.

10. If the instrument display does not light up:

    a. Ensure intensity control is set for maximum.
    b. Turn off power.
    c. Disconnect the DB25 connector from the instrument.
    d. Check intensity control.
    e. Check the wiring installation and breaker or fuse.

11. Proceed to "Instrument Setup".
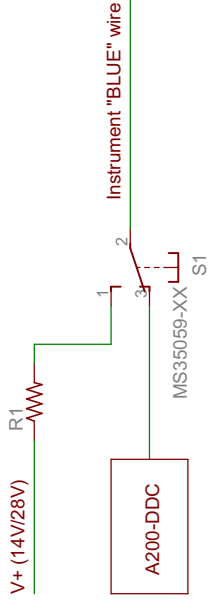
Variable Intensity Installation

V+ (14V/28V)

R1

A200-DDC

MS35059-XX

S1

Instrument "BLUE" wire

1-2 : Fixed Intensity
3-2 : Variable Intensity

R1 Part Number S200-R14-xx - 14V

# Instruments	R1
1	C1
2	C2
3	C3
4	C4
5	C5
6	C6
7	C7
8	C8
9	C9
10	CA

R1 Part Number S200-R28-xx - 28V

Fixed Intensity Installation

V+ (14V/28V)

R2

R3

MS35059-XX

S2

Instrument "BLUE" wire

1-2 : Day/Night Operation
3-2 : Day Operation

R2 & R3 Part Number S200-R14-xx - 14V

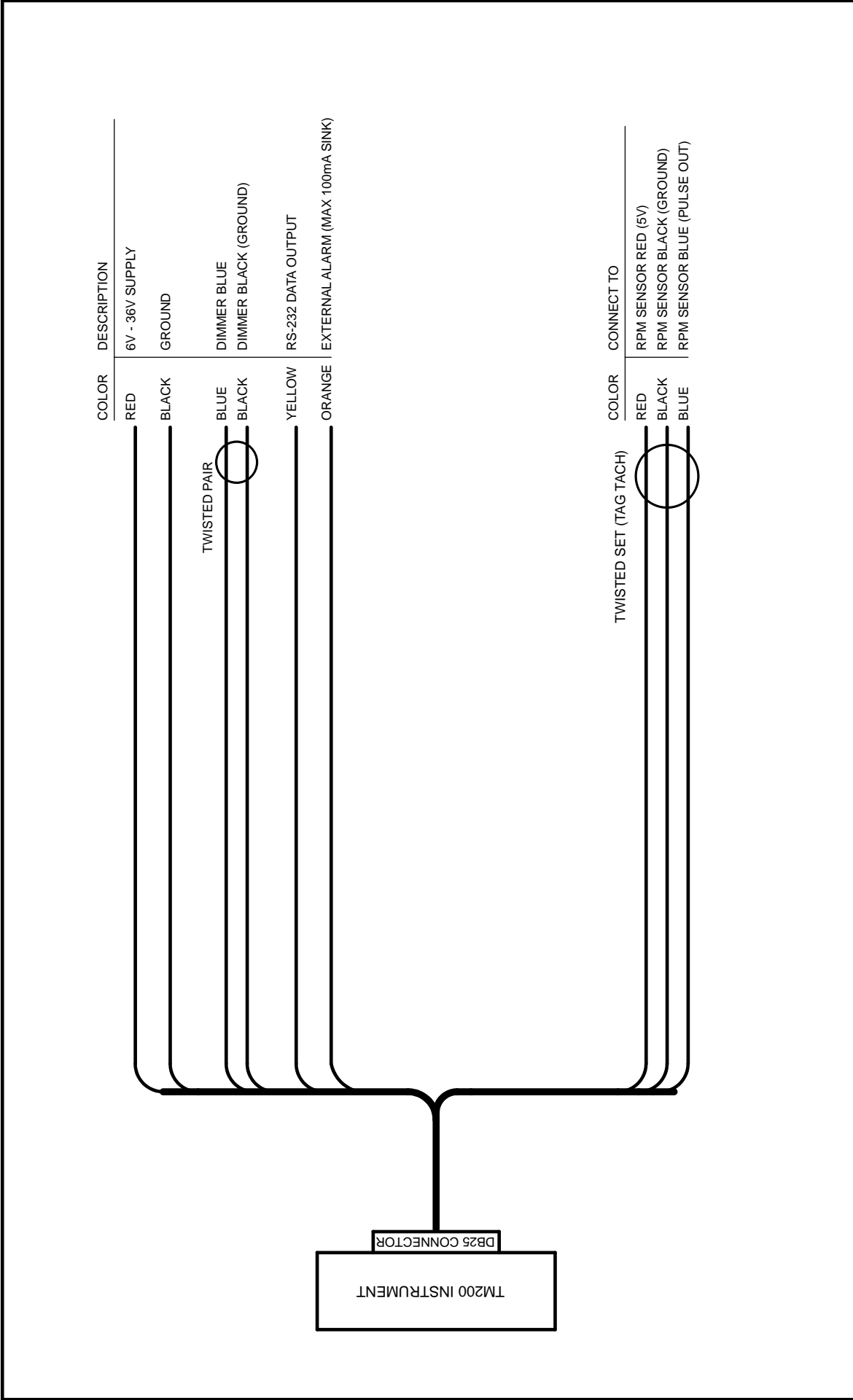| # Instruments	R2	R3
1	A1	B1
2	A2	B2
3	A3	B3
4	A4	B4
5	A5	B5
6	A6	B6
7	A7	B7
8	A8	B8
9	A9	B9
10	AA	BA

R2 & R3 Part Number S200-R28-xx - 28V

TITLE: Intensity Control - Installation Options - Rev 1.1
(c) 2009 Aerospace Logic Inc.

Document Number:
S200-DDC-INST

REV: A

Date: 18/11/2009 4:24:00 PM

Sheet: 1/1

TM200X Wiring and Installation Schematic

TM200 INSTRUMENT

DB25 CONNECTOR

COLOR	DESCRIPTION
RED	6V - 36V SUPPLY
BLACK	GROUND
BLUE	DIMMER BLUE
BLACK	DIMMER BLACK (GROUND)
YELLOW	RS-232 DATA OUTPUT
ORANGE	EXTERNAL ALARM (MAX 100mA SINK)

TWISTED PAIR

COLOR	CONNECT TO
RED	RPM SENSOR RED (5V)
BLACK	RPM SENSOR BLACK (GROUND)
BLUE	RPM SENSOR BLUE (PULSE OUT)

TWISTED SET (TAG TACH)

ACCESSORY NOTES:

1. For dimmer use LCD Lighting Controller P/N A200-DDC
2. For Bendix magnetos use sensor P/N A200-HMB
3. For Slick/Unison magnetos use sensor P/N A200-HMS

INSTALLATION NOTES:

1. Allow for current drain of 0.1A (100mA)
2. Install using breaker or panel fuse
3. Maximum 7 instruments per 1A of breaker capacity
4. For multiple instrument installations install breakers to comply with redundancy requirements of AC 23.1309-1D Appendix 1
5. Connect all BLACK (GROUND) wires to the same ground point

200 Series Human Interface Definition

All 200 Series instruments have been designed around a standard Human Interface protocol. This allows identical operation of the two panel switches between all instruments while still allowing multiple functions. This document is a generic outline of the functionality of the switches, based on the various functional states of the instrument.

Top Button

The top button is the action button. It invokes different screen displays, allows selection of values and increments or decrements values.

Examples of these actions are:

1. Moving between display screens
2. Selection of an action from a menu
3. Changing a value from within the setup menus
4. Entering a value during flight (clock instrument only)

Bottom Button

The bottom button is the navigation button. It will allow the cursor on the screen to move between allowable selections.

Examples of these actions are:

1. Selection of different cylinders (EGT and CHT) in the Single Cylinder mode
2. Selection of different tanks (Fuel Level)
3. Selection of limits and functional items from within the setup menus
4. Time field selection (clock instrument only)

There is one exception to the functionality of the bottom button. This is from the Primary Display (the screen that first comes on from power up). Pressing the button will display the instrument core status and support data.

General

1. Each specific instrument contains detailed button options within the Operations Guide.

2. During setup, instructions are provided on screen and use of the buttons is as noted in this document.

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Document # S200-HID
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TM200X Instrument Setup

1. Before proceeding with the instrument setup you will require the following information, as it pertains to the aircraft that the instrument is being installed on:

   a. Minimum indicated RPM (the point at which tach time starts recording)

   b. Maximum operating RPM

   c. RPM redline

      If the engine has a defined "limited operations range" then you will also need:

   d. Minimum limited operations value

   e. Maximum limited operations value

2. This information must be obtained from a current, traceable source for the aircraft that the instrument is being installed on. Some possible sources are:

   a. Pilot Operating Handbook

   b. Maintenance Manual

   c. Aircraft Type Certificate Data Sheet

   d. Engine Type Certificate Data Sheet

   e. Manufacturer

3. Then, enter the correct parameters into the instrument as follows:

   a. Turn off the power to the instrument

   b. Press and hold both top and bottom buttons and turn on the power to the instrument.

   c. When instructed, release both buttons.

   d. In the setup menus, use the bottom button to navigate and the top button to select an option.

   e. Follow the onscreen instructions. ***NOTE: Depending on the installation orientation of the instrument the display may initially be upside down. The first prompt in the setup is to press the button at the top of the instrument. This will orientate it correctly.*** Continue with setup.

4. Once all steps of the setup have been completed, the instrument will provide the option to edit any data or to save and exit.

5. If the data entered is correct, exit setup, otherwise choose the edit option.

6. Once the instrument has exited the setup it will restart. It is now ready for use.

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TM200X Operations Guide

This manual outlines the operating procedures for all TM200X series products

1. **Power Up / Default Screen**
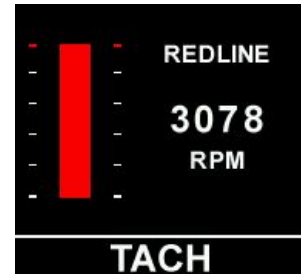
    Displays the engine RPM information. Colors are determined by the range values as set during installation.
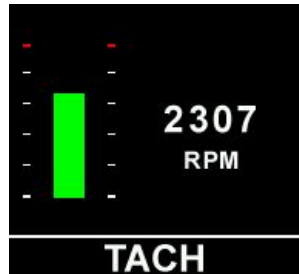
Normal Operations	**Redline Condition**

    If the engine has a limited operations range specified and the engine RPM is currently in that range, the display will use a yellow caution bar and have the text "LIMITED" above the RPM indication.
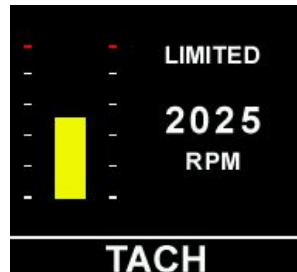
    Press the top button once to move to the next display.

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2. **Engine Time Display**

Engine time MUST be set before the first flight.

The engine time screen will timeout and return to the default screen once the blue activity bar disappears.

Engine Time NOT Set

Engine Time – Normal Conditions
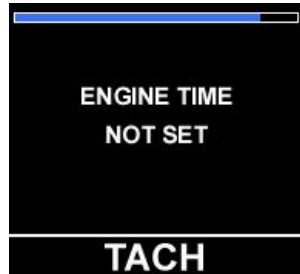
Press the top button to move to the next display or wait for the timeout period to expire.

3. **Trend Graph**
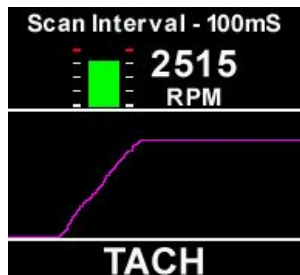
This screen provides a graphical display of the engine RPM.

RPM data is displayed with a miniature version of the bar as on the default screen and the actual value.

The "Scan Interval" can be changed by pressing the bottom button.

To freeze the display, press the top button ONCE.

To continue displaying information in this mode, press the bottom button **ONCE**, OR, to return to the default screen, press the top button once.

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4. **Other Options**

   To display the instrument serial number and core information press and hold the bottom button when in the default screen.

WARNING

All engine operations are to be performed in accordance with the specific instructions pertaining to your aircraft, including those provided by the engine manufacturer. The TM200X series instruments are only parameter reporting devices which can assist in engine management when used in conjunction with these instructions.

All TM200X products are certified as primary replacements, within the limits as described above, or for secondary use as desired.

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TM200X Product Specifications

Certification / Compliance
    TSO   C49b
    Environmental   DO-160F
                                 A1CAASXXXXXXZBXXBBBCSBA1C11XXAX
    Software   DO-178B

DC Power Source	Input voltage	6 to 36 VDC
	Power consumption	100mA
	Load dump tolerance	+60V
	Direct spike tolerance	+/- 60V
	Cable spike tolerance	> +/- 1KV

Operating Temperature	Constant operating	-15ºC to +55ºC
	Short term operating (1hr)	-40ºC to +70ºC
	Storage	-55ºC to +85ºC

Signal Input   0-5V pulse width modulated square wave

Display   RPM   0 - 9000

Accuracy   AS404C   +/- 1 RPM

Display   Sunlight readable LCD
                              176 X 192 display pixels, 65,535 colors

Annunciator Output   100mA sink with reverse EMF protection

RS-232 Data Output   1 second per full sequence at 57.6K bps (8/N/2/N)

Interface Connector   DB-25

Software Functionality
    Primary   Engine RPM
    Engine Time   Display of engine time
    Trend Graph   Graphic display of engine RPM

Dimensions   2.45" X 2.45" X 0.9"

Weight (excluding harness)   4.05 oz

Finish   Black anodized 6061 aluminum

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TM200X Installation Compliance

1. **Installation Procedures and Limitations**

   Should your specific aircraft not be listed on our STC Approved Model List (AML), contact your local FSDO or flight authority for installation requirements **BEFORE commencing any installation tasks.**

   Installation must be in accordance with the following TM200X published documents:

   a. Installation Instructions,
   b. Wiring and Installation Schematic,
   c. Instrument Setup, and

2. **TSO COMPLIANCE NOTICE**

   The conditions and tests required for TSO approval of this instrument are minimum performance standards. Those installing this instrument on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The instrument may be installed only according to 14 CFR part 43 or the applicable airworthiness requirement.

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