Remote Angle Display P/N RAD14-FLX-B

Features

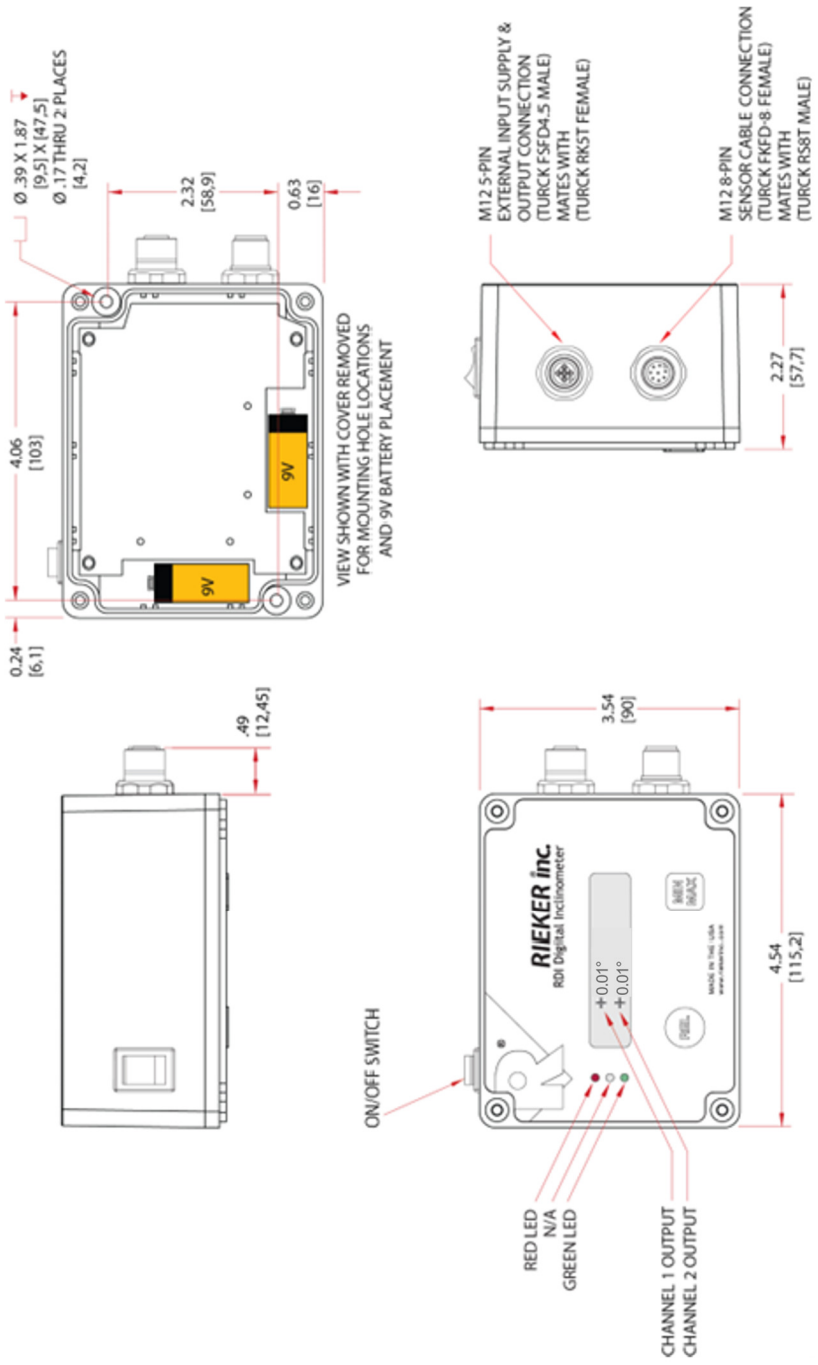
- Digital Display, for use with Flex Series H6-FLX Sensor type (sold separately)
- *Measuring Range:*
  - ±180° both axes
- *LCD Display:*
  - Dual Line
  - 0.01° Resolution
- Unit of Measure:
  - Degrees (°) - default
  - Percent Grade (%)
- *Additional Output Options:*
  - 4..20mA
- *LED Activation:*
  - Two (2) are activated (Green, Red)
  - Trip settings adjustable through measuring range in 0.1° increments.
- *LED Configuration:*
  - Green LED " on" indicates angle less than ± trip angle setting
  - Red LED "on" indicates angle greater than ± trip angle setting, (20° default setting)
- *Unit Power Supply Options:*
  - 9V Battery
    - Includes ON/OFF switch, low battery warning
  - 12-24VDC: non-regulated external power (not supplied).
- *Cables*:
  - Interface and Input/Output cables sold separately

CAUTION

This instrument has been manufactured to allow for trip angle adjustment. Purchaser assumes the responsibility of ensuring that the settings are appropriate for their specific application. IN NO EVENT WILL RIEKER BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND.

RAD14-FLX Display Technical Drawing

Figure 1: Housing Dimensions (inches [mm])



Unit Power Selection and On/Off Switch

(|) = 12 to 24 VDC External Power

(0) = OFF

(||) = Battery Power

REL and MIN/MAX Buttons

REL Button: (RELATIVE ZERO):

REL Function

This button allows the user to set a new temporary zero position for the connected remote sensor. The REL button is also used in Calibration Mode (CAL ON) as 'NEXT'.

Reminders

- an asterisk "*" symbol appears in REL mode
- relative zeroing procedure is temporary and will revert to factory zero when powered off

REL Operation

1. Press and release the REL button to activate; the display will read "REL ON *" for 1 sec then revert to normal operation showing "0.00° *"
2. The "*" indicates the measurement is not referenced to the factory calibrated 0, but a referenced zero. The MIN/MAX angles are now referenced to the new referenced zero.
3. Press the REL button again and the display will read REL OFF for 1 second then return to the factory calibrated zero. The MIN/MAX angles are now referenced to the factory calibrated zero.

Permanent Zero Operation

1. Press and hold the REL button for 10 seconds. "PZ ON" will display indicating that the Permanent zero has been set and the senor has been calibrated to 0 at its current tilt position.
2. To set a new Permanent Zero, repeat step 1.

MIN/MAX Button (MINIMUM / MAXIMUM ANGLE)

This function provides the smallest and largest angle the device has sensed since it was last reset. The MIN/MAX button is also used in Calibration Mode (CAL ON) as 'ENTER'.

- BEFORE proceeding with angle measurement, press the MIN/MAX button slowly three (3) times to reset the min/max angle:
  - *First* press displays "MIN" for one second (to freeze the "-" side reading).
  - *Second* press displays "MAX" for one second (to freeze the "+" side reading)
  - *Third* press displays "RESET", which returns to normal function.
- NOTE: MINIMUM "-" reading corresponds to counter-clockwise tilt; MAXIMUM "+" corresponds to clockwise tilt.
- As the inclinometer is rotated, the microprocessor temporarily records the largest positive and negative angles measured since the last reset.
- Once finished, manually record data by following these steps
  - press the MIN/MAX button once - the MIN angle "-" is displayed
  - press the MIN/MAX button again - the MAX angle "+" is displayed
  - press the MIN/MAX button a third time to reset the function
    - the display now shows current angle of sensor

Remote Sensor Flex Series: H6-FLX

- Mounts on horizontal surface only.
- Zero position connector facing user (see FRONT/SIDE VIEW of drawing below)
- X axis clockwise (connector to the right and down) tilt "+" (see SIDE VIEW of drawing below)
- Y axis clockwise tilt "+" (see FRONT VIEW of drawing below)
- **NOTE:** When using the H6-FLX with the LCD box, the interface cable connects to the H6's M12 male 8-pin connector only. The M12 female 5-pin is not used when connected to the RAD display. It is recommended to keep the protective cap (included with the unit) in place.

FIGURE 1: **Dimensions (inches [mm]) and Mounting Position**

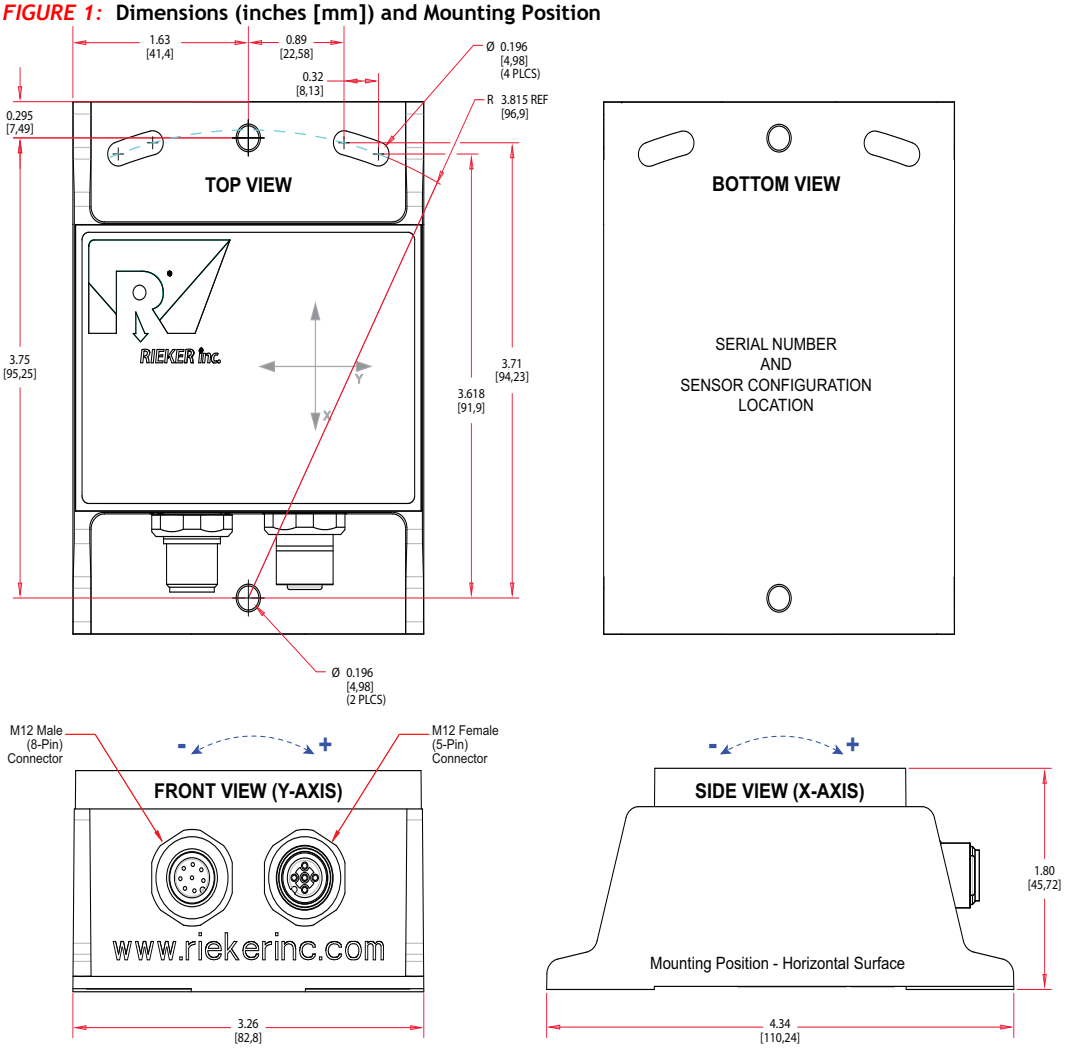


TABLE 1: H6-FLX SENSOR SPECIFIATIONS	
INPUT PARAMETERS	
SUPPLY VOLTAGE	+12..36 VDC Non-Regulated (+12..+24VC when used with display)
SUPPLY CURRENT[1]	22mA @ 24VDC (Digital Output only)
	30mA @ 24VDC (Analog Output - no load)
	75mA @ 24VDC max (Analog and Digital Outputs enabled)
	85mA @ 12VDC max (Analog and Digital Outputs enabled)
ANALOG MEASURING RANGE	Scalable To ±180°
DIGITAL MEASURING RANGE	±180°
INPUT PROTECTION	Reverse Polarity, ESD & Surge Protected
ABSOLUTE ACCURACY OVER FULL OPERATING TEMPERATURE	
RANGE: ±180°	±0.1º
CURRENT OUTPUT PARAMETERS	
OUTPUT TYPE	Factory Default: 4..20 mA (Configurable within 0..24mA)
SENSITIVITY[2]	Relative to Scaled Range
NULL (0º)	Factory Default: 12 mA Nominal (User Configurable)
RESOLUTION	0.05º Max
FREQUENCY RESPONSE	0.5Hz Nominal
DIGITAL OUTPUT PARAMETERS	
OUTPUT TYPE	RS-485 Half Duplex (2-wire)
INCLINATION OUTPUT	IEEE Packetized 32-Bit Float
BAUD RATE	62.5 KB
BYTE FORMAT	8 Data Bits, No Parity, 1-stop Bit, No Flow Control, CRC16 Checksum
PACKET FORMAT	See Installation Guide for Packet Details and Commands
INFORMATION RATE	Polled (up to 20 times/sec)
TEMPERATURE RANGES	
OPERATING TEMPERATURE	-40ºF..+185ºF (-40ºC..+85ºC)
STORAGE TEMPERATURE	-49ºF..+194ºF (-45ºC..+90ºC)
MECHANICAL CHARACTERISTICS	
HOUSING	Aluminum, IP68, All-weather
WEIGHT	18.6 oz. (525 Grams)
MOUNTING HOLES	Accept #8 or M4.5 screws (See Dimensional Drawing)
MOUNTING PLANE	Flat Horizontal Surface
OUTLINE DIMENSIONS	4.34” x 3.26” x 1.8”
ELECTRICAL CONNECTION	See Electrical Connection Drawing

Notes: 1. Supply Current varies depending on outputs connected. Digital output only assumes analog output section is always active however current loop is not connected. 2. Sensitivity defined as (max current range) / (sensor input range). Ex, A current range set to 4..20mA with a ±30° input range will have a corresponding sensitivity of 16mA/60° or 0.267mA/°.

CE European Compliance Statement:
This product complies with the requirements of European Directives 2004/108/EC.

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How to Adjust the Display Units of Measure "UNITS"

Notes:

1. The Display Units can be adjusted to show Degrees (°) or Percent Grade (%).
2. IMPORTANT - Percent Grade is only valid for a ±45° (±100% grade) range. Any angle beyond that range will be displayed as "over range".
3. The MIN/MAX button is the same as 'ENTER' and is used to store the calibrated Units in memory.
4. The REL button is used to toggle between (°) and (%) during calibration.
5. During the calibration process, if the RDI is left inactive for more than 30 seconds the Display Units setting automatically reverts to the last setting.
6. IMPORTANT - MIN/MAX button must be pressed in order to save the new calibrated values.

Adjustment Procedure:

How to Calibrate the Display Units of Measure "UNITS"

1. Turn off power to the RDI.
2. While pressing the MIN/MAX button reapply power.
3. When the display reads CAL ON release the MIN/MAX button.
4. "UNITS" and the "Current Display Unit" will be displayed.
5. To change the UNITS setting, press and hold the REL button until the desired UNITS setting is displayed. The UNITS setting will toggle between degrees (°) and Percent grade (%).
6. When the desired UNITS setting is achieved release the REL button.
7. Press the MIN/MAX button once to save the new UNITS setting.
8. Proceed to the Trip Angle Adjustment

How to Adjust the Trip Angle

Notes:

1. The Trip Angle Adjustment, which sets the Trip Point "TP" for the LED, follows immediately after the units Adjustment.
2. "TP1" is for the ± X axis Trip Angle and "TP2" is for the ± Y axis Trip Angle.
3. The Trip Angle can be adjusted within full range of sensor in 0.1° increments.
4. Setting the positive trip angle automatically sets the negative trip angle to the same value.
5. The new trip angles are saved until they are recalibrated to new settings.
6. The power must be off before calibration can take place.
7. The MIN/MAX button is the same as 'ENTER' and is used to store the calibrated Trip Angles in memory.
8. The REL button is used to raise and lower the trip angle during calibration.
9. During the Calibration process, if the RDI is left inactive for more than 30 seconds the Trip Angles will automatically revert to the last trip angle settings. Remember, the MIN/MAX button must be pressed in order to save the new calibrated values.

Adjustment Procedure:

How to Calibrate Trip Point Setting (Green LED “off", Red LED “on”)

1. Setting the “TP” adjustment follows the Units adjustment.
2. “TP1” and the “Current Value” will be displayed.
3. To change the TP1 setting, press and hold the REL button until the desired TP1 setting is displayed. The TP1 setting always increases first to the end of the range then decreases to the beginning of the range.
4. When the desired TP1 setting is achieved release the REL button. Press the MIN/MAX button once to save the new TP1 setting.
5. Repeat steps 3 and 4 to set TP2. When finished the display should indicate the current tilt of the box.

Wiring Tables

RAD14 INPUT POWER / OUTPUT CONNECTOR (M12 FSFD5)	
PIN	**DESCRIPTION**
1	NO CONNECTION
2	12..24VDC INPUT SUPPLY
3	POWER COMMON
4	4..20MA OUTPUT X-AXIS
5	4..20MA OUTPUT Y-AXIS
RAD14 INTERFACE CONNECTOR (M12 FKFD8)	
PIN	**DESCRIPTION**
1	12..24VDC OUTPUT POWER TO SENSOR
2	OUTPUT POWER COMMON
3	RS485-A (from H6)
4	RS485-B (from H6)
5	NO CONNECTION
6	4..20MA OUTPUT X-AXIS (from H6)
7	4..20MA OUTPUT Y-AXIS (from H6)
8	NO CONNECTION
H6-FLX MALE 8-PIN INTERFACE CONNECTOR	
PIN	**DESCRIPTION**
1	+12.. +36VDC INPUT SUPPLY (from RAD display)
2	POWER / SIGNAL COMMON
3	RS485 D+ OR CAN HI
4	RS485 D- OR CAN LO
5	CAN SHIELD
6	X AXIS 4..20MA CURRENT OUTPUT
7	Y AXIS 4..20MA CURRENT OUTPUT
8	NO CONNECTION