



A close-up shows the single cable which connects each sensor along the entire chain of inclinometer sensors forming a "digital bus."

WORKS WITH **flexDAQ** DATA LOGGERS

**READY TO RUN**  
pre-assembled  
pre-wired  
pre-tested  
pre-programmed



	PRODUCT CATEGORY:
	INCLINOMETERS + TILT SENSORS

# Digital Bus Vertical In-place MEMS Inclinometer System

Digital Bus Vertical In-place MEMS Inclinometer Systems are designed to measure lateral movement of soil and rock or deflection of man made structures such as piles or retaining walls, when remote and continuous monitoring is required.

These inclinometers consist of one or more MEMS inclinometer sensors housed inside a 31.75 mm (1.25 in.) diameter, water-tight, stainless steel enclosure. Each sensor is separated from the next by stainless steel rods and wheel assemblies; however, the entire system is connected by a digital bus system which consists of one single cable running the length of the entire chain of connected sensors; this eliminates the need of a separate cable for each sensor and reduces the amount of cable to be managed. Rod lengths can be varied to alter the bay length and sensors can be concentrated in areas of expected movement. An optional analog cable system is also available.

Wheel assemblies are sized to fit 70 mm (2.75 in.) or 85 mm (3.34 in.) O.D. inclinometer casing. As movement occurs and the inclinometer casing deforms, each sensor can be automatically monitored and can be read at a remote readout location. If necessary, an alarm can be triggered when movement reaches a preset critical rate or magnitude.



## > WHY IT IS IMPORTANT

Provides constant remote monitoring; early warning of movements is essential for protecting life and equipment.

## > APPLICATIONS

**Ideal for monitoring of:**

Stability adjacent to excavations or underground workings.	Deflection of piles, piers, abutments, or retaining walls.
Dams and embankments.	Landslides.

## > FEATURES

Water-tight, stainless steel enclosure.	On board electronics.
High precision, wheeled probe.	Easy adaptability to data logging.
Individual sensor monitoring.	Optional alarm.

## > BENEFITS

✓ <b>Increase Safety</b>	✓ <b>Cost effective per sensor point</b>
✓ <b>Increase Productivity</b>	✓ <b>Custom Options</b>
✓ <b>High Reliability</b>	✓ <b>High Accuracy</b>



The optional HOSS (Heavy Over-hole Suspension System) can be purchased to greatly reduce the exertion required to lower & lift instruments into boreholes and similar applications. View a separate brochure at [rstinstruments.com](http://rstinstruments.com) or contact RST for more info.

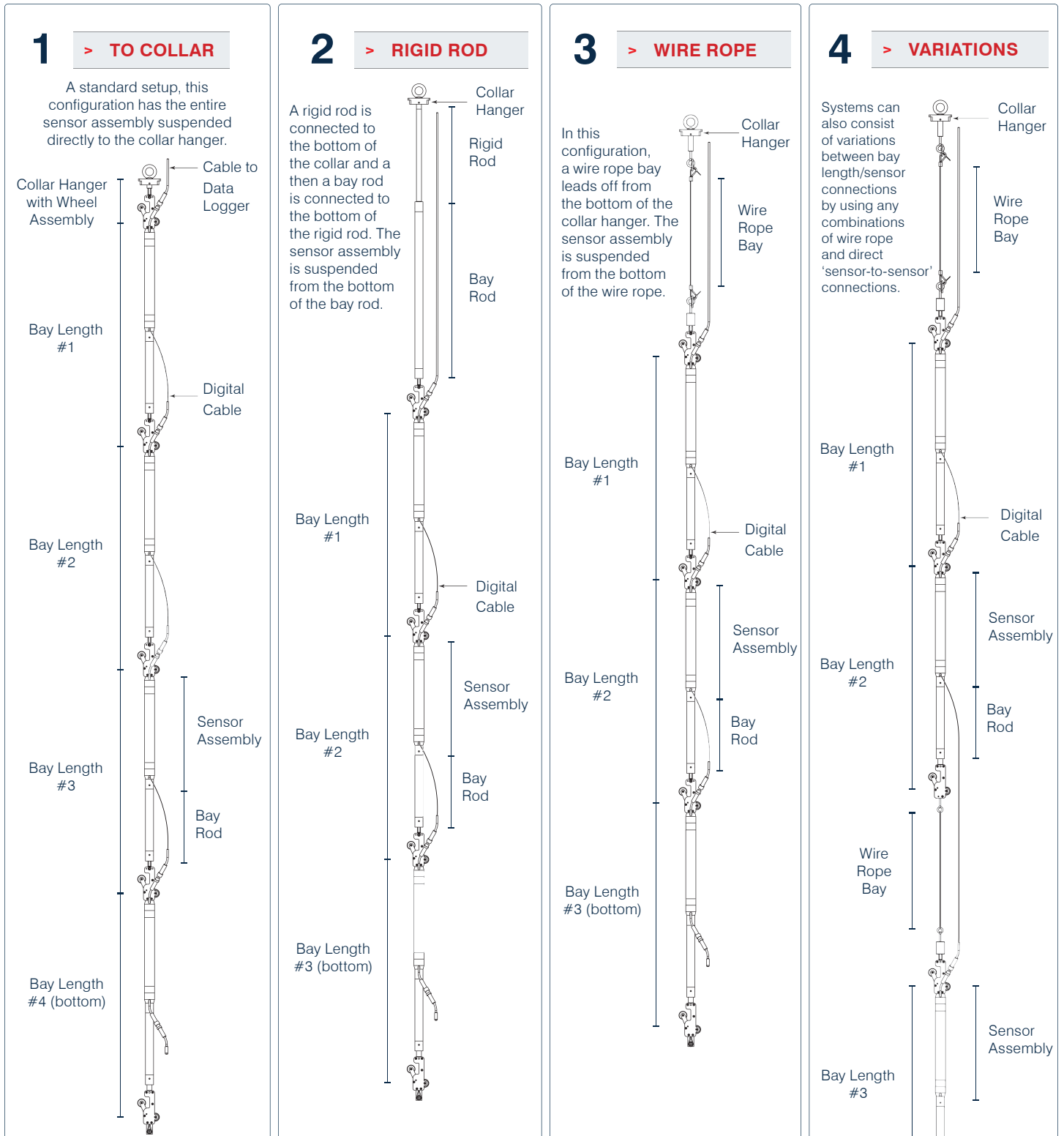


**VIEW IN ACTION:**  
<https://youtu.be/E-Y3pQ6VwfQ>

# Digital Bus Vertical In-place MEMS Inclinometer System

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## System Setup: 4 Types



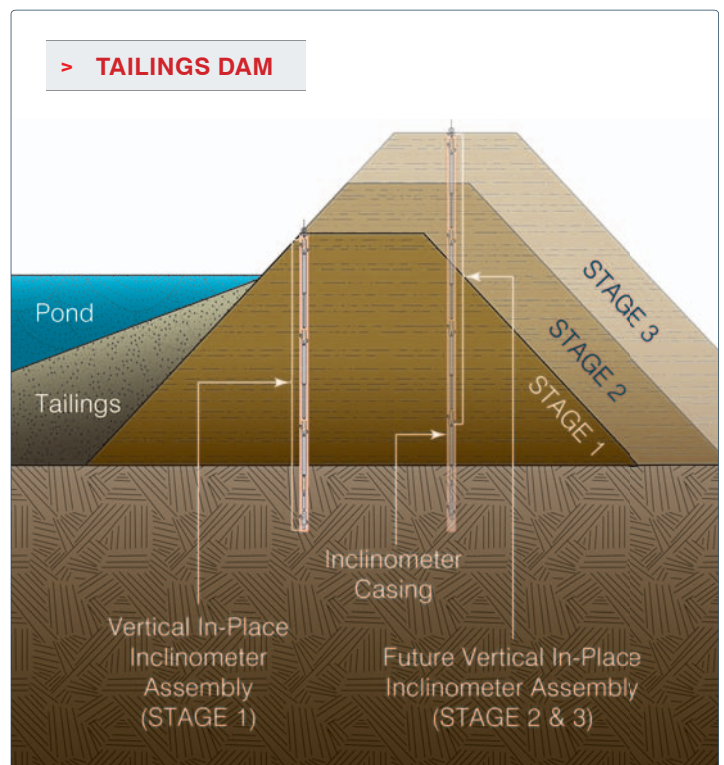
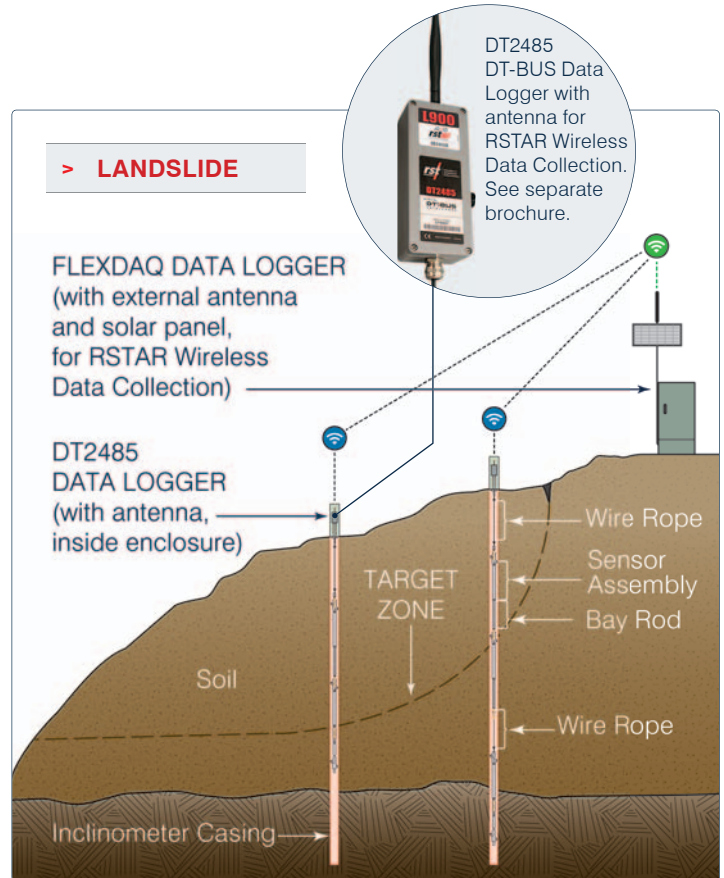
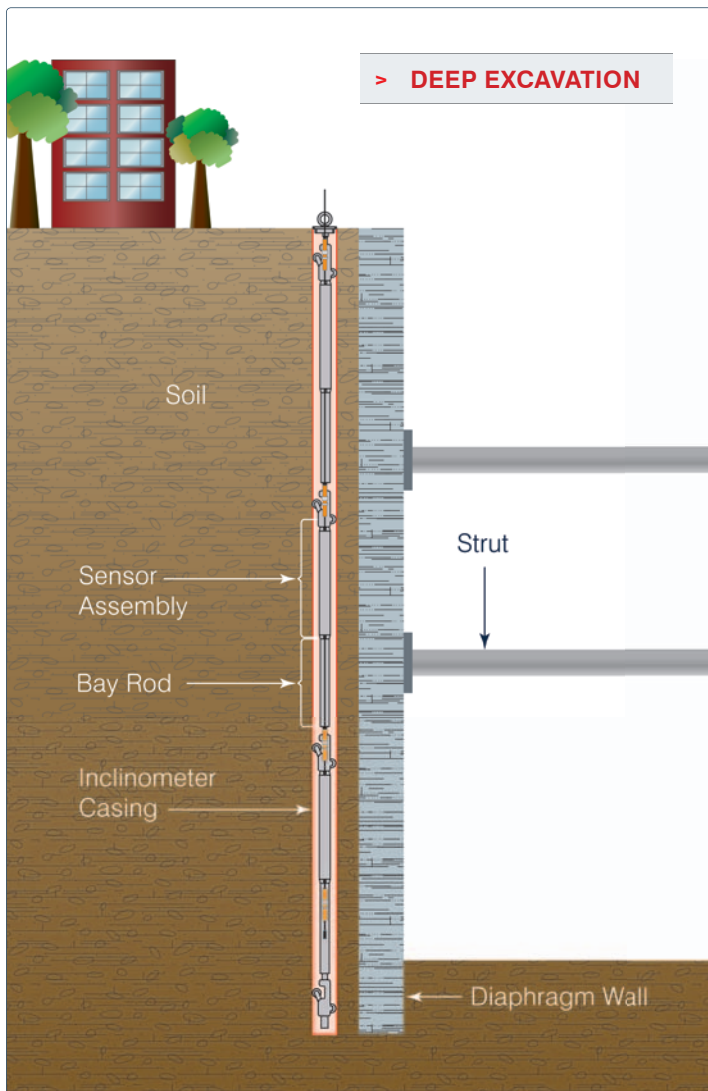
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## Installation Scenarios

The 4 main system setup types (see left page) can all be installed interchangeably across all applications where lateral movement, or deflection of structures can occur. The selection of the system setup type depends on site conditions & engineering requirements. As shown in the installation scenarios, the Vertical In-Place Inclinometer System is ideal for long term installation in trenches, landslide areas, dams and embankments.

Automated data collection methods can be made with the use of the RST DT2485 DT-BUS Data Logger and/or a FlexDAQ Data Logger System. For incorporating wireless data collection, the DT2485 is RSTAR and DT Link compatible. Manual data collection is available using the 'Ultra-Rugged Field PC2' - see separate brochure at rstinstruments.com.





Monitor  
with  
Confidence

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# Digital Bus Vertical In-place MEMS Inclinometer System

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## SPECIFICATIONS + ORDERING

SPECIFICATIONS	
<b>ELECTRICAL</b>	
<b>ITEM</b>	<b>SPECIFICATION</b>
Range	±15°
Resolution (digital)	±2 arc sec. (±0.0006°) (0.01 mm/m)
Resolution (analog)	±5 arc sec. (±0.025 mm/m) (10Hz BW)
Non-linearity (digital)	±0.0125% F.S. (±0.002°) (0.03 mm/m)
Non-linearity (analog)	±0.05% F.S. (±0.0075°) (0.13 mm/m)
Repeatability (digital)	±0.0125% F.S. (±0.002°) (0.03 mm/m)
Repeatability (analog)	±0.025% F.S. (±0.004°) (0.06 mm/m)
Sensor	MEMS (Micro-Electro-Mechanical Systems) Accelerometer Uniaxial or Biaxial
Sensor Offset	+/- 0.002 arc deg./deg. C
Sensor Sensitivity	+/- 0.013 % of reading/deg. C
Excitation (analog)	8 - 15V DC
Operating Temp.	-40 to 85°C (-40 to 185°F)
Ingress Protection	IP68 to 200m H2O (2000 kPa)
<b>MECHANICAL</b>	
Gauge Length	0.5 - 3 meters
Housing Diameter	31.75 mm (1.25 in.) (sensor)
Wheel Assembly	70 mm (2.75 in.) 85 mm (3.34 in.)
Bay Rod Diameter	25 mm (1.0 in.)

ORDERING: GENERAL INFO REQUIRED	
Part number	Bay length
Number of boreholes	Wheel assembly size (70 or 85 mm casing)
Number of sensors per borehole	Length of surface signal cable
Location of sensors in borehole	Optional wire rope bays

OPTIONS >> CONTACT RST FOR DETAILS
Imperial lengths available upon request
Analog systems available upon request
Submersible cable connector for bus options
Ultra-Rugged Field PC2 (see separate brochure)
DT2485: DT-BUS Data Logger (see separate brochure)
FlexDAQ Data Logger System (see separate brochure)

ORDERING: SENSORS	
<b>DIGITAL BUS CABLE SYSTEM</b>	<b>PART #</b>
MEMS IPI bus sensor assembly: Biaxial for 70 mm casing	IC7565
MEMS IPI bus sensor assembly: Biaxial for 85 mm casing	IC7575
MEMS IPI bus sensor assembly: Uniaxial for 70 mm casing	IC7560
MEMS IPI bus sensor assembly: Uniaxial for 85 mm casing	IC7570
<b>DIGITAL WIRE ROPE SYSTEM WITH BOTTOM WHEEL ASSEMBLY</b>	<b>PART #</b>
MEMS IPI assembly: Biaxial 70 mm casing	IC7525
MEMS IPI assembly: Biaxial 85 mm casing	IC7555
MEMS IPI assembly: Uniaxial 70 mm casing	IC7520
MEMS IPI assembly: Uniaxial 85 mm casing	IC7550

ORDERING: BAY RODS	
<b>DIGITAL BUS, OR DIGITAL WIRE ROPE SYSTEMS</b>	<b>PART #</b>
Bay rod for 0.5 m gauge length	IC7700
Bay rod for 1 m gauge length	IC7701
Bay rod for 1.5 m gauge length	IC7702
Bay rod for 2 m gauge length	IC7703
Bay rod for 2.5 m gauge length	IC7704
Bay rod for 3 m gauge length	IC7705

ORDERING: CABLES	
<b>DIGITAL BUS, AND DIGITAL WIRE ROPE SYSTEM</b>	<b>PART #</b>
4 conductor, 22 gauge polyurethane jacketed cable (digital bus)	EL380004
<b>SUSPENSION CABLE - WIRE ROPE SYSTEM OR COLLAR TO FIRST BAY</b>	<b>PART #</b>
Stainless steel suspension cable 3/32"	IC7300

ORDERING: COLLAR HANGERS	
<b>DIGITAL BUS SYSTEM</b>	<b>PART #</b>
Collar hanger w/1 bottom wheel assembly for 70 mm casing	IC7070
Collar hanger w/1 bottom wheel assembly for 85 mm casing	IC7085
<b>DIGITAL WIRE ROPE SYSTEM</b>	<b>PART #</b>
Collar hanger for 70 mm casing	IC7070R
Collar hanger for 85 mm casing	IC7085R

