



BX PROBE MASTER

Multi-Channel Precision LVDT Measurement System

High Precision • High Speed • Multi-Channel • Industrial Connectivity

MADE IN INDIA

BharatX™

64 CH H10 LVDT PROBES

PROBE MASTER UNIT

High Precision • High Reliability • Made in India

SYSTEM OVERVIEW

- 64 Channel H10 LVDT Probe Measurement System
- High Speed, High Accuracy Acquisition
- RS485 Communication
- Robust Industrial Design
- Easy Integration & Configuration

H10 LVDT PROBES

GENERATOR UNIT

- Stable AC Excitation
- Supports Multiple Probes
- Low Distortion Output
- Overload Protection

HIGH ACCURACY

FAST RESPONSE

RELIABLE PERFORMANCE

EASY INTEGRATION

INDUSTRIAL GRADE

Up to 128 Channels Scalable measurement architecture	Up to 1 µm Accuracy* System-level, configuration dependent
High-Speed Acquisition Multi-channel deterministic capture	RS485 / TCP/IP / Wi-Fi / BLE Complete communication suite
Custom Protocol Support Application-specific integration	Industrial-Grade Design Built for continuous production use



*System accuracy depends on probe specification, calibration, mechanical setup, temperature, electrical environment, and measurement configuration.

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PRODUCT OVERVIEW

Scalable Multi-Channel LVDT Measurement Platform

The BX PROBE MASTER is a scalable multi-channel LVDT measurement platform designed for precision industrial displacement measurement. It centralises signal acquisition, calibration, communication, triggering, and data management for multiple measurement probes into a single industrial-grade controller. The architecture is expandable up to 128 measurement channels, enabling deployment across complex multi-point inspection fixtures and production lines.

PLUG-AND-MEASURE WORKFLOW

1. CONNECT LVDT Probe	2. SELECT Channel / Probe	3. CONFIGURE Probe Parameters	4. CALIBRATE Zero / Span
5. TRIGGER Set Mode	6. ACQUIRE Start Measurement	7. MONITOR Live Data	8. TRANSMIT PC / PLC / SCADA

TARGET APPLICATIONS

Dimensional Inspection	Automotive Component Inspection
EV / Battery Manufacturing	Precision Assembly Verification
Machine Monitoring	End-of-Line Testing
Production Quality Control	R&D Measurement
Automated Inspection	Multi-Point Gauging

SYSTEM BENEFITS

Scalable Architecture Up to 128 channels, configurable per project.	Plug-and-Measure Simple probe connection and channel configuration.	Multi-Interface Comms RS485, TCP/IP, Wi-Fi, BLE — wired and wireless.
Individual Calibration Each channel calibrated independently for accuracy.	Industrial Reliability Designed for continuous production-line operation.	Custom Integration Protocol and software customisation available.

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SYSTEM ARCHITECTURE & SIGNAL FLOW

Conceptual Signal Processing Pipeline



KEY ARCHITECTURE CAPABILITIES

Parallel multi-channel acquisition	Channel addressing & multiplexing
Measurement synchronisation	Trigger-controlled capture
Deterministic timestamping	FIFO buffer management

Error / status detection	Per-channel status flags
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MULTI-CHANNEL MEASUREMENT PLATFORM

Scalable Architecture — Up to 128 Channels

Each channel is independently configurable. The architecture scales to 128 channels depending on system configuration.

CHANNEL VISUALISATION (EXAMPLE: 16 CHANNELS SHOWN)

CH01 ACTIVE	CH02 ACTIVE	CH03 IDLE	CH04 ACTIVE	CH05 ACTIVE	CH06 IDLE	CH07 ACTIVE	CH08 ACTIVE
CH09 IDLE	CH10 ACTIVE	CH11 ACTIVE	CH12 IDLE	CH13 ACTIVE	CH14 ACTIVE	CH15 IDLE	CH16 ACTIVE

..... CH17 — CH128

(Additional channels available per configuration)

CHANNEL CONFIGURATION PARAMETERS

Parameter	Description	Parameter	Description
Channel Enable	Individual enable/disable	Trigger Mode	External / SW / Periodic
Probe Type	H10 / LVDT type selection	Alarm Limits	Min / Max alarm threshold
Measurement Range	Configurable per probe	Min / Max Limit	Application-defined
Zero Offset	Channel zero correction	EU Conversion	Engineering unit scaling
Calibration Coeff.	Multi-point coefficients	Channel Name/ID	User-defined label
Gain Configuration	Channel gain setting	Digital Filter	Cut-off configurable
Linearisation	Non-linearity correction	Acquisition Rate	Configurable per channel

LIVE CHANNEL STATUS MONITOR (EXAMPLE)

Channel	Probe	Status	Measurement	Unit	Min Limit	Max Limit	Alarm
CH01	H10-A	ACTIVE	10.245	mm	0.000	25.000	OK
CH02	H10-A	ACTIVE	8.112	mm	0.000	25.000	OK
CH03	H10-B	IDLE	—	mm	0.000	15.000	—
CH04	H10-B	ACTIVE	14.998	mm	0.000	15.000	HI!

Note: Values shown are illustrative examples only.

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PRECISION MEASUREMENT & CALIBRATION

System Accuracy Up to 1 μm — Channel-Wise Calibration

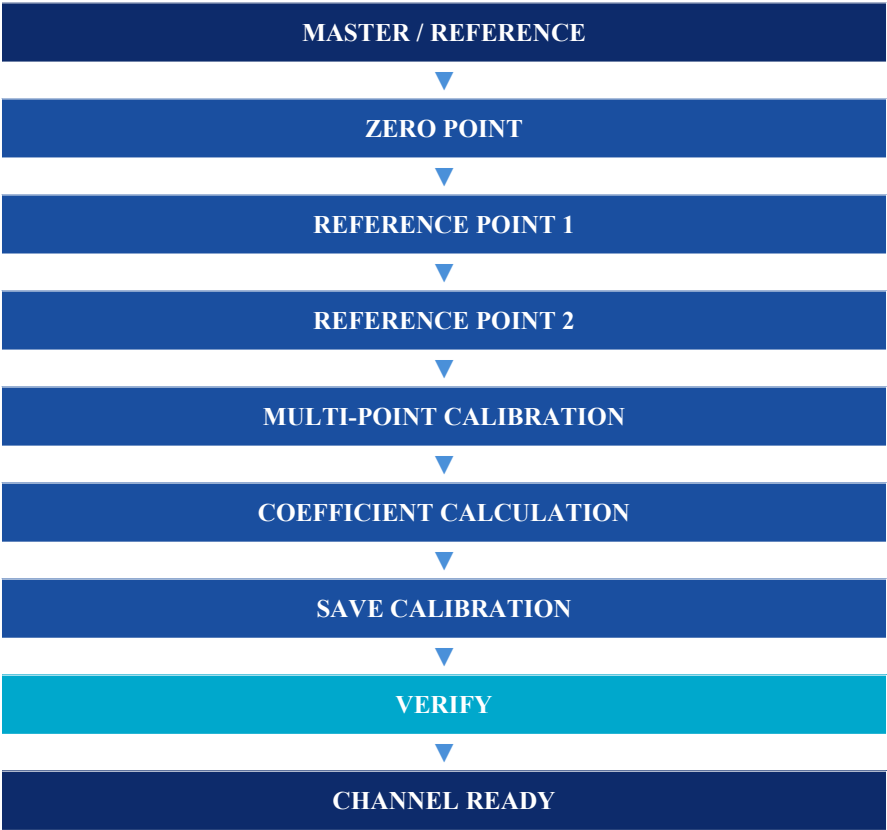
Up to 1 μm System Accuracy*

Subject to probe specification, calibration, mechanical setup, temperature, and system configuration

RESOLUTION VS ACCURACY VS REPEATABILITY

RESOLUTION The smallest change in measurement that the digital output can represent. Determined by ADC bit-depth and measurement span.	ACCURACY The closeness of the measured value to the true physical value. Affected by ADC, calibration, probe accuracy, temperature, noise, and linearity.	REPEATABILITY The ability of the system to produce the same output for the same physical input under the same conditions over repeated measurements.
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CALIBRATION WORKFLOW



CALIBRATION TYPES

Zero Calibration	Span Calibration	Multi-Point Calibration
Offset Correction	Gain Correction	Linearisation

Reference Calibration	Channel-Wise Calibration	Calibration Data Storage
Calibration Verification	Temperature Compensation	

TECHNICAL NOTE:

Actual achievable accuracy depends on LVDT probe accuracy, mechanical fixture, excitation stability, ADC/AFE performance, temperature drift, grounding, EMI, calibration reference, and complete system integration.

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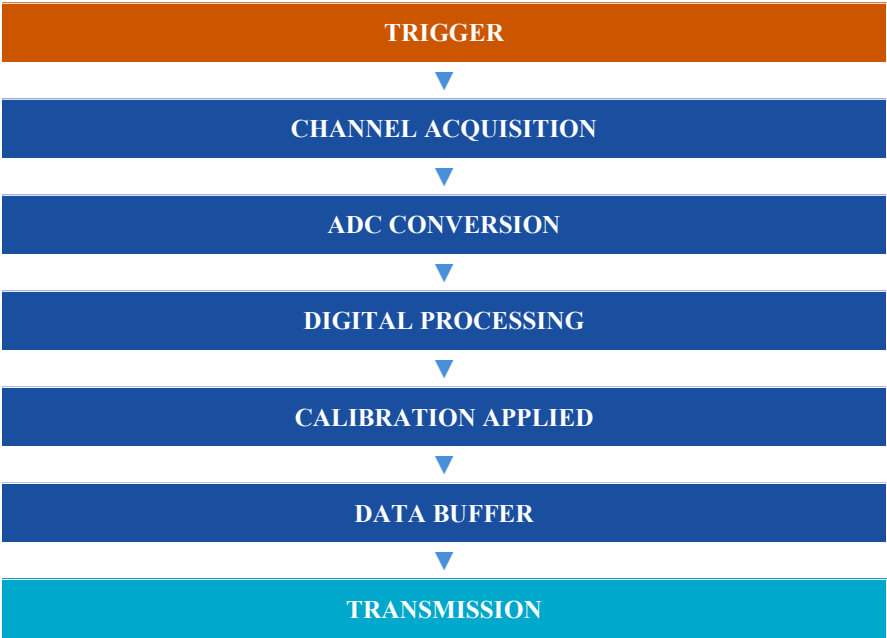
HIGH-SPEED ACQUISITION & DATA MANAGEMENT

Deterministic Trigger, FIFO Buffer, Timestamped Data

ACQUISITION MODES

Continuous Acquisition Ongoing channel scan for live monitoring.	Single-Shot Acquisition One triggered capture per event.	External Trigger Hardware signal input triggered.
Software Trigger Command-initiated capture.	Periodic Acquisition Time-interval based capture.	Production Cycle Machine-cycle synchronised capture.

ACQUISITION TIMING SEQUENCE



DATA MANAGEMENT FEATURES

Channel scan sequencing	Timestamped measurements	FIFO / ring buffer management
Data packetisation	Measurement status flags	Error / diagnostic flags
Data validation	Synchronised multi-channel capture	Configurable acquisition rate

Note: Actual maximum sampling rate per channel depends on ADC architecture, channel count, filtering, communication load, and firmware implementation.

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INDUSTRIAL COMMUNICATION & PROTOCOL SUPPORT

RS485 | TCP/IP Ethernet | Wi-Fi | BLE | Custom Protocol

RS485 Industrial wired differential bus. Long-distance capability. PLC / controller integration.	TCP/IP ETHERNET High-throughput wired link. PC / industrial network. Remote data acquisition.	Wi-Fi Wireless data transfer. Configuration interface. Remote monitoring.
BLE Short-range wireless. Mobile / PC config tool. Service & maintenance interface.	CUSTOM PROTOCOL Customer-defined packet format. BXtronics engineering support for full integration customisation.	

EXAMPLE CUSTOM PROTOCOL PACKET STRUCTURE

IMPORTANT: This is an illustrative example only. Final protocol is defined by customer requirements.

HEADER	DEVICE ID	CHANNEL ID	COMMAND	TIMESTAMP	DATA	STATUS	CRC	END
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COMMUNICATION ARCHITECTURE



COMMUNICATION USE CASES

Measurement data	Device configuration	Calibration parameters
Channel status	Trigger commands	Start / stop control
Diagnostics	Error information	Firmware integration

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CONFIGURATION PARAMETERS & SYSTEM INTEGRATION

System / Channel / Trigger / Data Parameters

SYSTEM	CHANNEL	TRIGGER	DATA
• Device ID • Firmware Version • Hardware Version • Channel Count • Comm. Mode • Baud Rate • IP / Port • Wi-Fi Config • BLE Config	• Channel ID • Probe ID • Measurement Unit • Offset / Gain • Cal. Coefficients • Digital Filter • Min / Max Limit • Alarm Limit • Enable/Disable	• Trigger Source • Trigger Mode • Trigger Delay • Acquisition Mode • Channel Selection • Cycle Configuration	• Data Format • Timestamp • Status Flags • Channel Status • CRC / Error Check • Packet Sequence

EXAMPLE COMMAND SET

Example command set only — final command definitions depend on customer protocol configuration.

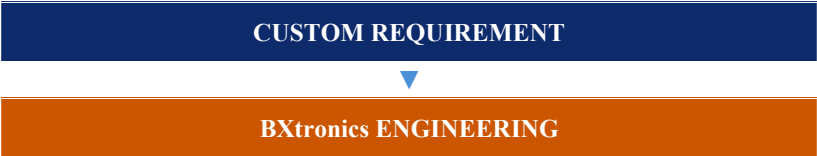
Command	Description
READ_DATA	Read measurement data from channels
WRITE_CONFIG	Write configuration parameters
READ_CONFIG	Read current configuration
START	Start acquisition
STOP	Stop acquisition
CALIBRATE	Trigger calibration routine
ZERO	Set zero reference for channel
STATUS	Read device/channel status
RESET	Reset device to default state

SYSTEM INTEGRATION

BX PROBE MASTER

PC SOFTWARE	PLC	SCADA / MES	ROBOT / AUTOMATION	CUSTOM APPLICATION
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BXTRONICS CUSTOM ENGINEERING WORKFLOW





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APPLICATIONS & INDUSTRIAL USE CASES

Automotive | EV / Battery | Precision Assembly | Production QC

Automotive Component Inspection Precision dimensional verification of shafts, bores, and machined parts on production lines.	EV / Battery Manufacturing Multi-point thickness and dimensional control during battery cell and module assembly.
Precision Shaft & Bearing Inspection High-accuracy runout, diameter, and eccentricity measurement in rotating components.	Multi-Point Dimensional Gauging Simultaneous measurement of multiple features on a single fixture with centralised data.
End-of-Line Testing (EOL) Automated pass/fail dimensional inspection at the end of the production process.	Robotic & Automated Inspection Integration with robotic cells and automated handling systems for inline measurement.
Precision Assembly Verification Confirmation of correct assembly dimensions and tolerances during build-up.	R&D Measurement Laboratories Flexible multi-channel data capture for research, prototyping, and development.
Machine Tool Monitoring Measurement of spindle displacement, vibration, and positional deviation.	Production Quality Control Centralised measurement data with digital traceability for SPC and QC reporting.

MEASUREMENT WORKFLOW CONCEPT



KEY PRODUCTION BENEFITS

Reduced manual measurement	Faster inspection cycles	Centralised measurement data	Consistent calibration across channels
Production line automation	Digital traceability and data logging	Reduced operator dependency	Easy machine integration

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TECHNICAL SPECIFICATIONS & CONTACT

BX PROBE MASTER | BXtronics Pvt. Ltd.

TECHNICAL SPECIFICATIONS

Parameter	Specification
Product Name	BX PROBE MASTER
Manufacturer	BXtronics Pvt. Ltd.
Product Category	Multi-Channel Precision LVDT Measurement System
Measurement Technology	LVDT / H10-type Displacement Probes
Channel Capacity	Scalable up to 128 channels (configuration dependent)
System Accuracy	Up to 1 µm* (configuration, probe & calibration dependent)
Acquisition	High-speed multi-channel acquisition
Input Type	LVDT / H10 measurement probe
Communication — Wired	RS485
Network	TCP/IP Ethernet
Wireless	Wi-Fi
Bluetooth	BLE (Bluetooth Low Energy)
Protocol	Custom protocol support (customer-defined)
Trigger	Software trigger / external hardware trigger
Power Supply	220 VAC
Calibration	Channel-wise: zero / span / multi-point / offset
Data Management	Real-time measurement, FIFO buffer, timestamped data
Integration	PC / PLC / SCADA / MES / Automation / Custom Software
Application	Industrial precision displacement measurement
Construction	Industrial-grade enclosure
Country of Origin	Made in India
Additional Parameters	Configurable / Application Dependent

*Accuracy depends on LVDT probe specification, calibration quality, mechanical setup, temperature, electrical environment, and overall system configuration.

WHY BX PROBE MASTER?

Precision Up to 1 µm system accuracy with per-channel calibration.	Scalability Expandable architecture up to 128 channels.	Speed High-speed multi-channel acquisition.	Connectivity RS485, TCP/IP, Wi-Fi, BLE — all in one platform.
Flexibility Custom protocol and software integration support.	Reliability Industrial-grade enclosure for continuous operation.	Support BXtronics custom engineering and application support.	

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"Precision Measurement. Intelligent Data. Industrial Integration."