

METRO BATCH



INNOVATIVE MODERN
BATCHING PLANT
SYSTEM

PRESENTED VERSION
12/25



"INNOVATIVE MODERN BATCHING PLANT SYSTEM"

This batching Plant System is designed to enhance **efficiency**, **speed**, and **accuracy** in concrete production. With key features such as fast loading, manual & auto system and ERP integration, it provides smart solutions to meet the demands of the construction industry.

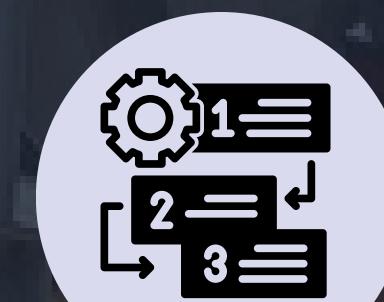
"Towards Efficient and Integrated Concrete Production."

COMPREHENSIVE PRECISION CONTROL SYSTEM

The Auto Mode in this Batching Plant System is designed to deliver **convenience**, **precision**, and **optimal efficiency** in concrete production. Equipped with advanced features, it ensures that every batch is processed according to established standards.



DYNAMIC SETPOINT
REDISTRIBUTION
(AUTO ADJUST)



AUTOMATED SEQUENCE
OPTIMIZATION



INTELLIGENT
TOLERANCE
MANAGEMENT

METROBATCH

DYNAMIC SETPOINT REDISTRIBUTION

(DSR)

$$\text{TargetBatch}_n = \frac{\text{TargetTotal} - \sum \text{Actual}}{\text{Remaining Batches}}$$

- Continuous Re-optimization**

Unlike traditional systems that only apply simple error compensation, this system performs a full re-optimization for every remaining step in the process.

- Theoretical Basis: Moving Average Compensation**

- Key Technical Advantages:**

Prevents Over-Correction: Avoids overloading a single batch by distributing large deviations over multiple future cycles.

Enhanced System Stability: Smoothens material fluctuations, ensuring the physical capacity of the mixer is never exceeded.

Accumulated Accuracy: Guarantees that the final total output perfectly matches the project requirements.



Batch No.	Calculated Target	Actual (Sensor)	Deviation	Remaining Target	Remaining Batches
1	$800 / 4 = 200$	180	-20	620	3
2	$620 / 3 = 206.6$	220	13.4	400	2
3	$400 / 2 = 200$	200	0	200	1
4	$200 / 1 = 200$	200	0	0	0

INTELLIGENT TOLERANCE MANAGEMENT

$$\text{NewTarget} = \text{TargetPerBatch} - (\text{Tolerance\%} \times \text{TargetPerBatch})$$

- **Fixed Percentage Offset**

The system allows users to input a specific tolerance value (e.g., 10%) to create a "**Safety Buffer**".

- **Purpose: Waste and Overfill Prevention**

By reducing the target by a fixed percentage, the system proactively accounts for "**In-Flight**" material (material still falling after the gate closes).

- **Key Technical Advantages:**

Error Prevention: Reduces the risk of exceeding the maximum weight capacity per batch.

Cost Efficiency: Prevents over-filling, ensuring that the actual material used aligns perfectly with the budget.

Precision Control: Works in tandem with the Dynamic Auto-Adjust feature to ensure the total project weight remains 100% accurate.

This system integrates **Dynamic Setpoint Redistribution** and **Intelligent Tolerance Management** to create a highly precise and efficient concrete production ecosystem. By utilizing a continuous target re-optimization approach combined with proactive Waste and Overfill Prevention, the system ensures that every batch is processed according to the highest quality standards, achieving zero accumulated error by the end of the production cycle.



REAL SAMPLE

- K550/FC45

Batch	Actual All Material	Target All Material	Deviation (Actual - Target)	Error (%)
1	3472,91 kg	3454,77 kg	+18,14 Kg	0.53%
2	3456,84 kg	3454,77 kg	+2,07 kg	0.06%
3	3426,86 kg	3454,77 kg	-27,91 kg	-0.81%
4	3463,84 kg	3454,77 kg	+9,07 kg	0.26%
Total	13.820,45 kg	13.819,08 kg	1,37 kg	0.01%

Cycle Time Performance by Mix Design (Concrete Grade)

Mix Design	K-350	K-300	K-250	K-225	K-175	K-125	AVERAGE
Cycle Time / Batch	1m 56s	1m 31s	1m 41s	1m 36s	1m 48s	2m 10s	1m 47s

- K350/FC24

Batch	Actual All Material	Target All Material	Deviation (Actual - Target)	Error (%)
1	3478,22 kg	3478,19 kg	+0,03 Kg	0.00%
2	3493,21 kg	3478,19 kg	+15,02 kg	0.43%
3	3485,21 kg	3478,19 kg	+7,02 kg	0.20%
4	3454,20 kg	3478,19 kg	-23,99 kg	-0.69%
Total	13.910,84 kg	13.912,76 kg	-1,92 kg	-0.01%

Productivity Comparison Table

Parameter	Manual System	MetroBatch System	Effect (Improvement)
Cycle Time / Batch	5m	1m 47s	2.8x Faster (64% Time Saved)
Total Batches / Hour	12 Batches	33 Batches	+21 Batches/Hour (+175%)
Total Production (8 Hours)	96 Batches	264 Batches	+168 Batches per Shift

METROBATCH HARDWARE

CONTROL PANEL
CUSTOMIZE



INDICATOR AND
PUSHBUTTON BUILDIN

CONTROLLER



COMPUTER & PRINTER

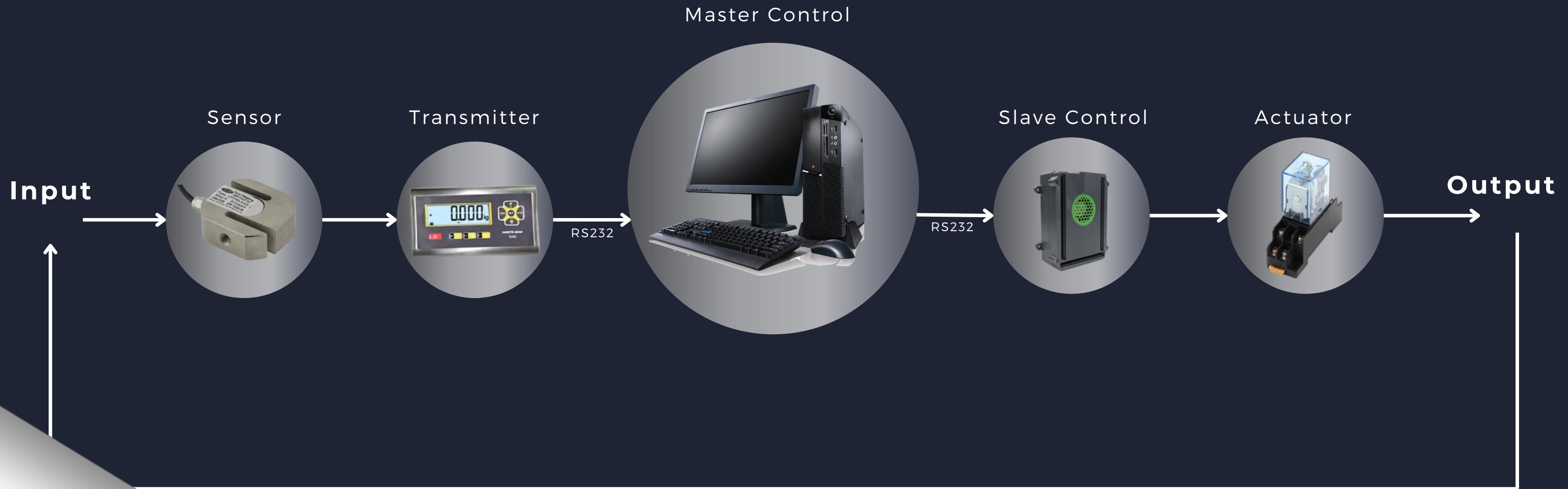


SOFTWARE

Following the needs of the plant

COMPUTERIZED CONTROL SYSTEM

Master-Slave Communication



DIRECT DIGITAL CONTROL (DDC)

COMPUTERIZED CONTROL SYSTEM

Master-Slave Communication



DISTRIBUTED CONTROL SYSTEM (DCS)

FLEXIBLE DATA INPUT

Our system enables seamless data input and retrieval from any device, as long as it's connected to the internet. This flexibility ensures operational efficiency and accessibility:



Input Mix Design from Any Device

Easily input mix designs using smartphones, tablets, or PCs, allowing for quick adjustments and updates.



Print Reports from Any Device

Generate and print reports on demand, directly from any internet-enabled device for convenient documentation.



Integrated with ERP

Fully compatible with ERP systems, enabling centralized data management and streamlined operations across departments.

INPUT

- Material.
- Customer.
- Truck.
- Mix Design.

or base ERP.



START LOADING

Loading operated by the operator



REPORT



USER ROLES



Operator

Focused on managing material loading and ensuring smooth operational execution.



Technician

Responsible for configuring and maintaining mix design parameters.



Supervisor

Oversees the entire operation, ensuring quality control and system performance.



CONCLUSION

This Batching Plant System is designed to enhance efficiency, accuracy, and flexibility in concrete production.

This system not only accelerates the process but also ensures the highest concrete quality with advanced technology. With this innovation, you can tackle modern production challenges more effectively.

"Towards a Future of Efficient, Integrated, and High-Quality Concrete Production."

For more information
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