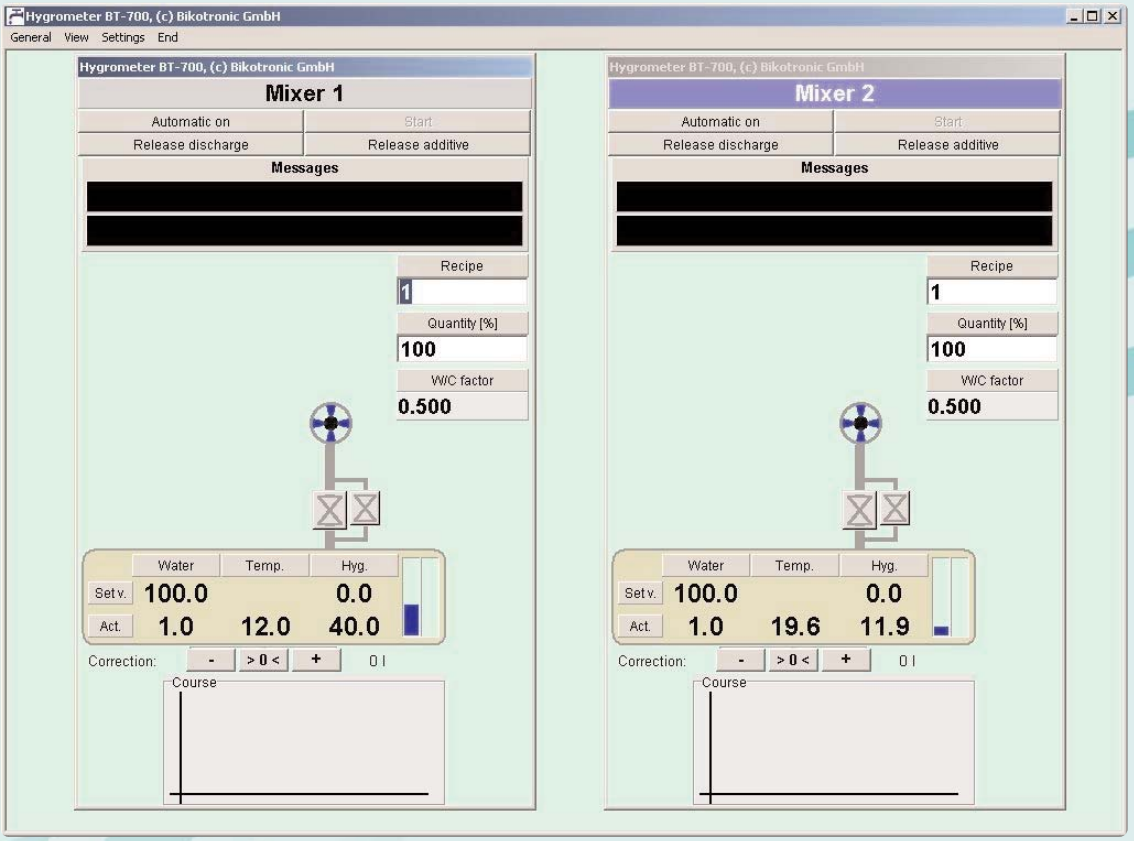
BIKOTRONIC®

MEASURING · CONTROLLING · OPTIMISING

BT-700

Water Batching Computer

Concrete Moisture Measurement in the Mixer

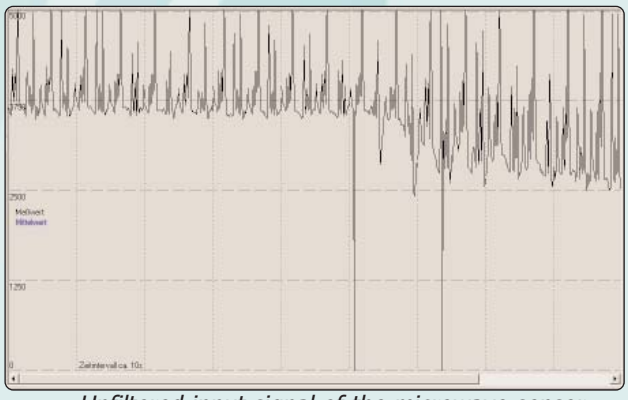


Nowadays, the concrete quality is of vital importance for the industrial production process. In order to meet the increasing quality demands, it is essential to control and regulate the moisture content. The Water Batching Computer BT-700 determines the moisture of the concrete in the mixer fast and exactly. It calculates and doses the water to be added with high repeatability and is thus the basis for a constantly optimal concrete quality.

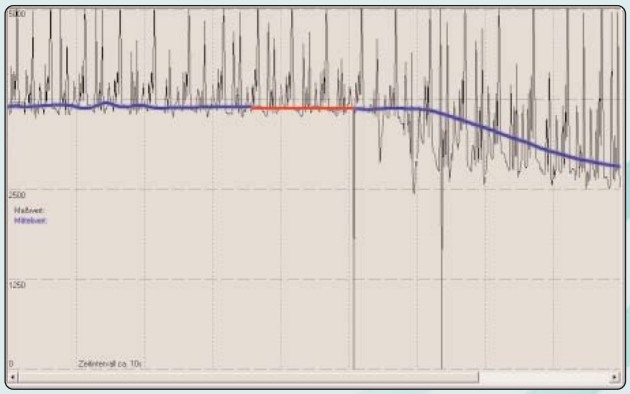
The advantages

High Repeatability

The multi-level processing of the measured values is an important feature of the BT-700 as it ensures a particularly high repeatability. Thanks to this technique, every mixer with its specific mixing performance can be adjusted to the output signal of the sensor. Measuring outliers are suppressed for mixers with very high amplitude fluctuations. Thus, we have a constant value for calculating the water to be added. This is especially favourable for the production of precast parts or Self-Compacting Concrete.



Unfiltered input signal of the microwave sensor



Filtering of the multi-level processing of the measured values (blue) and interpretation of the final filtering (red)

Programming of the BT-700

The programming of the Water Batching Computer BT-700 has been designed to be extremely user-friendly, in order to make the operation as easy as possible. To enter and set up a programme for a concrete formulation, we prepare a batch in the manual mode. During the dry mixing cycle, we enter the amount of water necessary to make a perfect mix. After confirming the added amount of water, the BT-700 will run the mixer automatically through its mixing cycle.
In the course of the programming mode, the BT-700 creates and automatically stores in its memory a "tuning curve", which will be typical for this particular concrete formulation. For any following concrete batch of the stored recipe, the amount of water will be accordingly calculated and correctly metered into the mixer.

The "Tuning Curve"

The distinct advantage of the Bikotronic Water Batching Control System BT-700 is the creation of the "tuning curve". Every time we enter a new recipe, the system will create automatically a recipe specific "tuning curve". This ensures the highest possible accuracy for the preparation of each concrete mix. Since recipe specific "tuning curves" are automatically created and saved by the BT-700, the operator does not need to edit or calibrate these curves by using complicated water/cement ratio calculations.

Temperature Measurement

Variations in the temperature of the raw materials, due to changing outside temperatures or the raw material delivery system, influence the properties of the dry mixture in the mixer, which most water batching systems do not recognize.
The BT-700 not only measures the moisture content during the dry mixing phase, it also measures the temperature of the dry concrete mix. Temperature deviations are recognized and the amount of water added is adjusted in accordance to a temperature curve, which is stored in the background of the programme. This feature ensures the correct moisture content in the concrete, even at elevated product temperatures.

Remote Maintenance

The remote maintenance of the BT-700 is realised via modem or internet in order to help the customer quickly and transfer programme updates easily.

Control Connection and Specifications

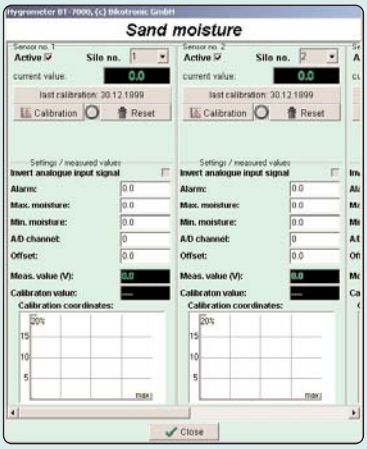
The BT-700 can be connected to any control system. It is available as 19” 4RU slide-in, as hard box for fixation on mounting plates or in all common PC cases.

One BT-700 for 4 Mixers

With the BT-700 you can control up to 4 mixers operating at the same time, preparing different formulations.

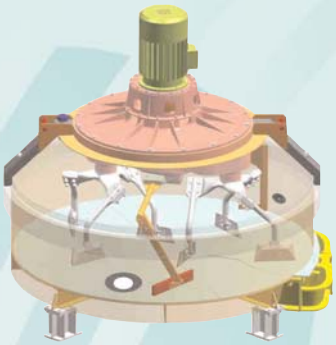
Integrated Sand Moisture Measurement

A sand moisture measurement with up to 8 sensors can be integrated into the BT-700. The sand moisture values are then displayed directly in the BT-700.



BT-700

Water Batching Computer



Mixer

Temperature Sensor

Microwave Sensor

Water Dosing Unit

Water Batching Computer
BT-700

Microwave Sensors

General Information

The microwave sensors were developed in cooperation with the chair for high frequency engineering of the technical faculty of the Christian-Albrecht-University in Kiel. The measurement accuracy of the microwave sensor under laboratory conditions is better than 0.1 %.

Linearity

The complete linearity of the microwave sensor allows precise measurements with very dry concrete as well as very wet concrete.

Temperature Stability

The microwave sensors for installation in mixers are heat-resistant up to 60 °C. This guarantees that the measured value remains stable under high temperatures and does not vary.

Wear

Our microwave sensors are extremely wear resistant. The ceramic measuring field is 10 mm thick and protected against lateral damage through a hardened shell. The microwave sensor is also equipped with a wear head which can be exchanged by the customer.

Mixer with Rotating Mixing Pan

The microwave sensor type 7 for installation in the mixer with a rotating mixing pan has a temperature meter installed in the microwave sensor and does not need an external temperature sensor. This sensor is installed in the wall scraper of the mixer.

If it is not possible to install a wall scraper, the microwave sensor type 8 is applied.

Typ 6 / Typ 7

Microwave Sensor for Pan Mixers Type 6 and for Mixers with Rotating Mixing Pan, Conical Mixers, Single and Twin-Shaft Mixers Type 7

Measurement frequency:
433 MHz

Measurement area:
All consistency areas

Temperature area:
0 to + 60 °C

Installation size sensor:
Type 6: diameter 105 mm, length 100 mm
Type 7: diameter 90 mm, length 80 mm

Installation size mounting attachment:
Type 6: diameter 150 mm, height 35 mm
Type 7: diameter 122 mm, height 30 mm

Typ 8 / Typ 8K

Microwave Sensor for Mixers with Rotating Mixing Pan Type 8

Measurement frequency:
433 MHz

Measurement area:
All consistency areas

Temperature area:
0 to + 60 °C

Installation size sensor:
Depending on the mixer
Maximum length including
mounting attachment 1.20 m

Installation size mounting attachment:
Depending on the mixer

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Constant Concrete Quality

Who is not familiar with this problem: If the core concrete is too dry it will not form smooth lateral surfaces, if the core concrete is too wet the stones become "bulbous" and the stones are bound to fall through when packaging. These problems can only be avoided by guaranteeing a constant concrete quality.

Mass Products
Here are a fast production, good filling behaviour of the core concrete with constantly the same height as well as homogeneous and clean face concrete with a uniform appearance particularly important. These targets can be reached with the aid of a water batching computer.

Precious Products
The number of precious products is constantly increasing. Special designs are enriched with granite, basalt or granulated material. In order to obtain always the same effect when refining afterwards (panning out, brushing etc.) the design has to be produced always with the same moisture.

Concrete Stones
The constant moisture of the core concrete is very important to avoid cracks. Furthermore the constant moisture has a positive effect on the filling behaviour of the concrete in the form and on de-casing the products.

Lightweight Concrete
The measuring accuracy of the moisture measurement for LECA lightweight concrete, pumice lightweight concrete and lava lightweight concrete has been improved significantly by using the microwave sensors.

Wet Concrete
The automation of the production of finished parts is becoming more and more common.
Therefore it is increasingly important to produce concrete with a consistent quality in order to guarantee a satisfactory automatic processing.

Self Compacting Concrete (SCC)
The accurate addition of water enables the Self Compacting Concrete to fill any premolded casing without hollow spaces, to encase the reinforcement intensively, and to ventilate and equalize without disintegrating itself.

Solution
The Water Batching System BT-700 produces concrete with the same sieve line with always the same quality, independently of temperature variations and extreme moisture variations in the aggregates.

Temperature Sensor
To determine the temperature of the mixing material.

Installation size sensor:
Diameter 76 mm, length 50 mm
Installation size
mounting attachment:
Diameter 83 mm, length 50 mm
Temperature area:
0 up to +80 °C

Water Dosing Unit
For dosing the water into the mixer, including coarse and fine valve, dirt trap and volume flow measuring turbine.

Available sizes:
DN 25, DN 40, DN 50

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