

Control systems from Liebherr



LIEBHERR

Liebherr control systems allow a comprehensive overview of all functions

1

Litronic-BCS

An inexpensive, but highly efficient control system provided by Liebherr for basic task assignments.

2

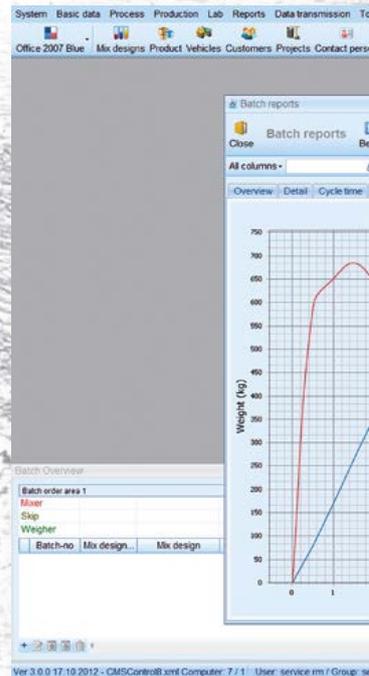
Litronic-MPS

Covering all aspects of concrete production, the Litronic-MPS control system is designed to fulfil every requirement.

3

Accessories

An extensive array of hardware and software options completes every respective requirement of your system.



Batch

Close Begin Prev. Next End Refresh New Save Print Delete

All columns - Plant 1

Overview Detail Detail 2 Set values

Batch-no 1 Plant 1 Client 0 Order-no Set (m3) Actual (m3) Last change 22.01.2013 10:28 By service rm

Customer/project: Customer: 50000 Heumann

Transport: Veh-no 04 804 LP BC-BW 230

Other: DT printer Standard

Batch reports

Close Begin Prev. Next End Refresh Save Print

All columns - Total

Overview Detail Cycle time Workability Feeding diagram Statistics

Client 0 Plant 1 Date 22.01.2013 Time 09:40 Delivery ticket-no 5947 Batch-no 24596 No of batches 1

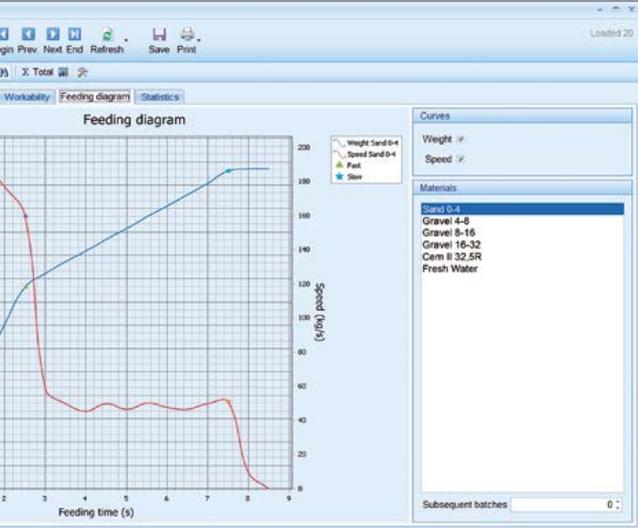
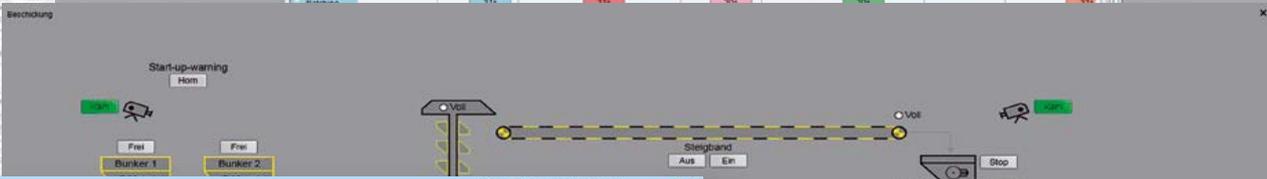
Mixer 1	Outlet 1	Quantity 1,0	m3	Return quantity	Mix time (s) Set 30	Mix time Actual (s) 30
Mix design 1001T100	0	LMT 1 Referenzsorte		DT-Ret-City 0,0	Strength class C 35/	Target strength (N/mm²)
Expos-Cl XC4, XD2, XF2, XF3, XA1L, XA		Max. aggregate 32		Density class Rohdich	Workability class F3	
Product A1001T100	LMT 1 Referenzsorte			Air content (%)	Workability Actual 101	Workability Set 0
Veh-no 301	LP BC-N 319				Workability from lab	Workability from project
Customer					Flush water (kg) 0,00	Mix water (kg) 0,00
					Water correction (kg) 0,00	Air temperature (°C) 14,3



Batch Overview

- Batch order area 1
- Mixer
- Stop
- Wegher
- Batch-no Mix design

Ver 3.0.0.17.10.2012 - CMS Co



System

Stop Start Restart

Over pressure ZE 2 0,01

ZE 2 0,01

Abkl Fret 4

ZE 2 0,01

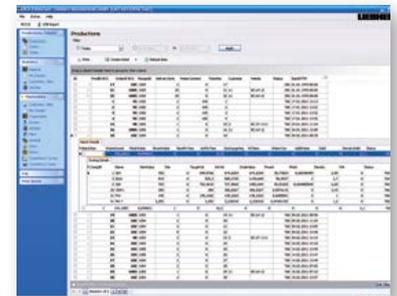
ZE 2 0,01

Abkl Fret 5

Bildwechsel Dos Besch Meld

1 Litronic-BCS

The Litronic-BCS is a fully-automatic and real time control system. This low cost version is ideally suited for applications in smaller concrete mixing plants. A touch screen allows simple execution of standard tasks and data management. An additional flow sequence facilitates autarkic manual operation of the mixing plant should fully-automatic operation no longer be available.



Features:

- Fully-automatic compact batching control
- Operation possible in a choice of several languages
- Operation via 10.4" TFT touch screen and membrane keyboard
- Autarkic manual operation possible via hardwired flow sequence
- Management of order and recipe
- Respective file for customer, building site, driver and vehicle
- Batch protocol memory
- Moisture control via manual values or optional Litronic-FMS sensors
- In-flight optimisation
- Filling and discharge of the mixer in relation to the respective recipe
- Processing of residual water (recycling) depending on content of solids
- Connection of printer for delivery notes or protocols possible
- Front USB connection for data backup
- More efficient switching between operating menus using function keys
- Numeric keypad, arrow keys, command keys
- Modem, alternative integration in the Liebherr Teleservice portal possible
- Connection points for external PS2-keyboard and mouse

Options:

- The optional „Datatool“ software allows the printing of delivery notes with up to 10 formats specific to respective orders, as well as diverse evaluations or statistics. Datatool is installed on the PC of the customer (MS Windows).
- The mixer motor output and concrete consistency can be displayed on the screen of the BCS as required.

System data:

Intel Atom-Processor 1.6 GHz
4 GB SSD-drive, 1GB RAM
MS-XPe, .NET 4.0 Framework
without fan, no moving parts
PLC 32-Bit/IEC 61131

Operation of a max.:

6 weighers (non legal for trade)
6 aggregates
4 cements/additives
2 water
4 admixtures
6 moistures



The Litronic-BCS is installed in the switch cabinet to save space.



2

Litronic-MPS for maximum functionality

Versatility of the Litronic-MPS mixing plant control allows every requirement to be fulfilled. This state-of-the-art control ensures optimum efficiency during concrete production, as well as maximum rates of discharge.

- Real-time control system ensures extremely quick reaction times, a necessary feature for a high level of dosing accuracy
- Weighing system is tested and certified in accordance to international legal metrology recommendations (OIML-R76 and OIML-R51)
- EC-Type-Approval as NAWI or ACI
- Industrial components can be purchased across the globe, thus guaranteeing a high protection of investments
- A Profibus interface provides optimum flexibility and minimises the necessity for cabling
- Full integration of programs, auxiliary functions and extra equipment
- Can be fully integrated in the Liebherr Teleservice portal

Monitoring and control of all principle elements of the plant at a glance

Silos for aggregates with filling level indicator and actual moisture values

Silos for cement with filling level indicator and comparison of reference/actual values

Water batching

Batching Admixture



Loading the mixer

Mixer featuring functional display and gate

Switchover to other areas of the plant, e.g. loading of silos, filling gravel etc.

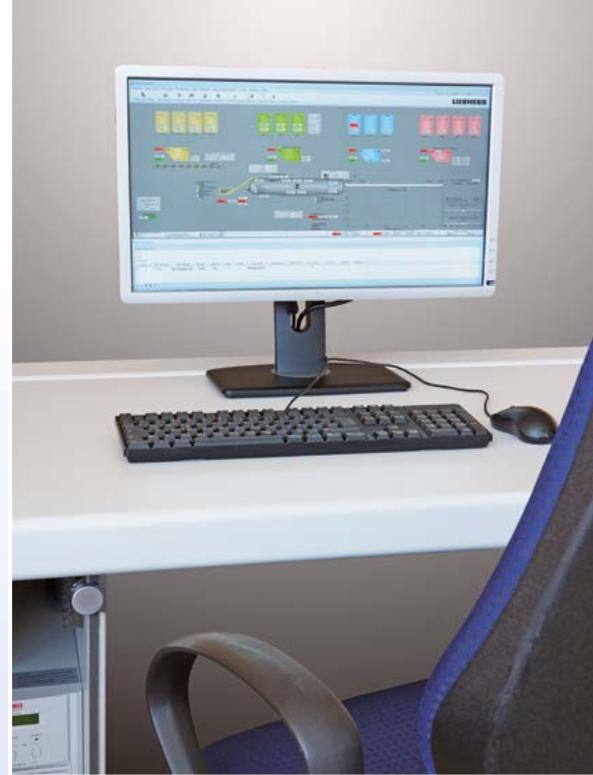
Consistency (optional)

Litronic-MPS LV

„Light-Version“ featuring single monitor

As a more inexpensive variant for basic task assignments, the Litronic-MPS LV control features all significant functions as a single-monitor solution.

The Litronic-MPS LV is a proven control with the ability to upgrade for up to a maximum of six weighers and one mixer. The system comprises a computer, keyboard, mouse, one monitor, a VPN router for Teleservice and software. An uninterrupted power supply to the system is also featured for flawless operation. The MPS LV allows the possibility for standardised printing of delivery notes, as well as for data exchange. Simple operation of the plant via clearly arranged display screen visualisation using the mouse. It is possible to switch between the various display screen masks as desired. The MPS LV can be upgraded to the comprehensive MPS at any time.



LV = „light version“ with one monitor



Overview of Litronic-MPS features:

System

- Windows-7/x 64 Professional operating system
- System tested and certified in compliance with OIML and WELMEC guidelines
- Components widely available (configured for 24/7 operation)
- Integrated backup system for the user
- Selection of languages which can be changed during the runtime
- User administration with access rights management
- Administration of error texts and fault signalling

Procedure, monitoring and optimisation of processes

- Real-time processing with event-driven logic to ensure the highest possible discharge rate for the plant, without limiting the necessary precision
- Dynamic moisture measuring for added aggregates (also on the weigher belt) featuring automatic sand-water correction
- Provision for solids content in the residual water
- In-flight optimisation adapted to the respective plant technology
- Automatic regulation of concrete temperature by recording the individual temperatures of all raw materials
- Control of mixer loading for individual recipes

Management of orders and master data

- Order management over a specific time period with automatic creation of loading lists and material preview
 - Printout of delivery note for individual customers adapted to respective standards and requirements
 - Minimum volume management for individual vehicles
 - Revision of delivery notes
 - Master data management (material data, grading curve, items, recipes, customer/building site, vehicles, types of vehicles, driver, manufacturer, special services, cash sales price list etc.)
 - Multiple customers. Delivery notes relating to specific building sites or orders can be created for several companies
-
- Automatic safety monitoring of the maximum W/C value and of the minimum cement content prior to mixer discharge.
 - Semi-automatic recognition for conclusion of mixing time.
 - Mixer consistency indicator in accordance with the prescribed standard and type of indication, graphically on the display screen, may also be printed on the delivery note as required.
 - Simplified semi-automatic comparison of consistency indicators.
 - Automatic regulation of mixer discharge with regard to filling level of mixer, consistency and vehicle.
 - It is possible to intervene manually at any time during automatic operation, without having to switch over to manual operation.
 - Recording of all amounts batched in manual operation.



Processing and archiving of process data

- Calibratable appraisal and archiving (system tested in accordance with OIML and WELMEC with EC type approval), exportable
- Archiving of batch protocols on the system database, exportable on the network server, USB stick or CD-ROM drives

Data communication

- Interfaces to all commercially-approved EDP, planning and laboratory systems.
- Teleservice-compatible up to the field level for internet connection via VPN-secured Liebherr Teleservice portal (xDSL, DOCSIS, PSTN, ISDN, UMTS, HSDPA)
- Integration in the customer network

Statistics

- Recording the supply of material, together with the material consumption data and the actual silo filling levels, allows control of material assignment. As manual consumption is also recorded completely, an uncontrolled extraction of material is not possible
- Concrete inspections entered on the batching control are transferred automatically to the laboratory.
- Test log as summary. Upon recording of the order, the control will specify whether cubes are to be manufactured, taking the respective concrete families into consideration
- Comprehensive statistical evaluations such as construction section statistics, consumption of each type of material, production for each customer/building site, concrete type, vehicle etc.

Characteristics

- Specifications for transport concrete (dry batch, wet batch), prefabricated units/concrete products, including combinations thereof
- Factory log and plant log book
- Freely definable operating hours counter
- Access right management with user log book and change history
- Archiving of batch protocols as PDF and in a legal for trade long-term archive
- Plant process diagram/time diagram with storage
- Analysis tool for monitoring and optimisation of batching precision
- Assignment planner with reminder function
- Simplified modification of settings via the visualisation (moisture, clearance of silos etc.)
- Varying adjustments in admixture for concrete and priming mortar
- Printout of delivery notes, also with laser printer with preselectable number of pages
- Printout of a cash sale invoice on the protocol printer
- Scan function for delivery notes requiring revision with automatic recognition (barcode) and allocation
- Low-cost factory planning. Status transmitter and vehicle tracing can be integrated directly in the control

Litronic-MPS systems are subject to a continuous product maintenance and improvement process, whereby the requests and requirements of our customers are promptly incorporated on a global basis. This ensures that we are constantly up to date with market requirements. Findings obtained from our ongoing customer and service training courses conducted within our training centre are also incorporated.

Note: The respective order confirmation specifies the precise delivery scope.

Maximum operational safety due to reliable hardware

Widely available components (designed for 24/7 operation) ensure maximum operational safety for many years. All principle control components are qualified to meet the special requirements of mixing plants. In particular, this includes computer systems, UPS systems and measuring amplifier with PLC functionality. The outstanding degree of innovation for this Liebherr technology is evident in the following examples:

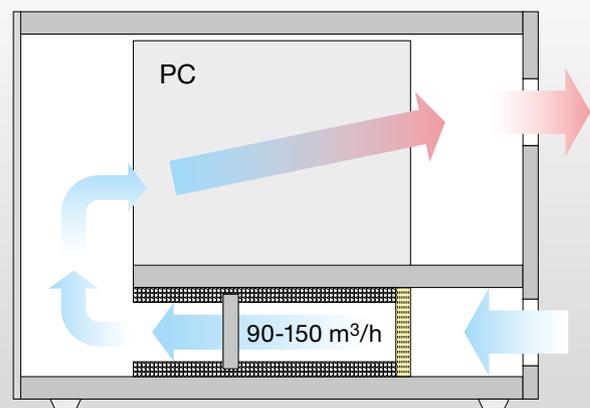
Measuring amplifier:

- Multi-channel configuration, modular upgradable
- Qualified, tested and approved for operation subject to calibration in accordance with EU and international guidelines
- An innovative switch design based on state-of-the-art ARM processor, FPGA and digital filter technology ensures optimum precision, even with intense material flow
- Softsealing calibration lock and state-of-the-art data encryption ensure a high degree of protection against tampering, even during data transfer
- Ultra-fast PLC-CPU featuring IEC 61131 programming provides ample reserve, also for larger and more complex plants
- Integrated Profibus master with original Siemens ASPC2 technology
- Manufactured to the strictest quality criteria in Liebherr production facilities for maximum reliable operation



PC-box:

- A ventilator in the PC-box provides air circulation, cooling and overpressure to prevent the penetration of dust
- The largely-dimensioned fine dust filter purifies the air
- Life-expectancy of the components is increased considerably
- The box also provides space for the UPS and network
- Noises from the PC and fan are minimised
- The box is mounted on rollers and can be positioned on both sides (left/right)
- Energy-efficient design with a power requirement of <math><5W</math>, suitable for inducted air temperatures up to



3

Accessories and additional equipment



Options:

- Delivery note printer
- Printer trolley
- Moisture measuring Litronic-FMS
- Temperature measuring system Litronic-TMS
- Interfaces to all prevalent concrete transport and concrete processing systems
- Consistency control in the mixer
- Vehicle scheduling in various implementation levels
- ProLab concrete laboratory program
- Invoicing program
- Additional work stations, including those via Windows computers available on the building site
- Factory planning
- Filling gravel
- Monitors for further visualisations or camera playback
- Video monitoring systems compatible with the network, with recording capability in accordance with H.264 Standard and alarm signalling
- Connection to CAD/CAM-production systems
- Automatic concrete ordering
- Remote call-up terminals/requirement notification points (decentralised concrete requirement)
- Integration of vehicle weighers

Additional options upon request



Moisture measuring Litronic-FMS



Delivery note printer



Mobile requirement notification point

Perfectly mixed top-quality concrete with Liebherr control systems



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Subject to technical modifications.

Liebherr-Mischtechnik GmbH
Postfach 145, D-88423 Bad Schussenried/Germany
☎ +49 7583 9 49-0, Fax +49 7583 9 49-3 99
www.liebherr.com, E-Mail: info.lmt@liebherr.com