C.W. Brabender®
INSTRUMENTS, INC.

Lab-Station Plasti-Corder®

Multi-master system with self-intelligent modules...

Modular

The Lab-Station is for application investigations or processing tasks in laboratories and simulation.

Just dock the movable and self-centering measuring heads like mixers and extruders to the basic unit. Run material tests or processing and compounding tasks with your extruder docking stations and realize outputs between 200 g/h and 60 kg/h. Or profit from the free operating volumes of 30 to 440 cm3 of the mixer docking stations.

The heart of the Lab-Station is the fully digital 7-kW motor, which ensures full torque of 400 Nm over the entire speed range from 0.2 min-1 to 150 min-1. The inverter drive provides for precise and constant speed even under this load. Furthermore, a torque measurement is integrated.

All control modules and sensors required for additional equipment are allocated to the docking stations and are recognized automatically after coupling. Integration of the performance electronics in the individual docking stations allows preheating of the measuring head even without the basic unit or cleaning of the extruder or mixer under temperature.

For such manual operation, all important control data can be read on a control panel at the docking station.

Benefit from state-of-the-art software packages for recording, representing, and evaluating your measuring data and documenting your tests.

intelligent
- with CAN bus
technology

C.W. Brabender® - Lab Station

Standard bus system

The integration of modern fieldbus system into the new PLASTI-CORDER® makes working with the Lab-Station a real breeze: Permanent communication between control modules, sensors, and computer, easy wiring of the system components, multiple expansion facilities - just plug and play.

The CAN bus used in the Lab-Station has become a standard in system configuration - all components like pressure or temperature sensors and the necessary controllers for a laboratory system will be available within the long future.

Self-intelligence

Self-intelligence modules are capable of self-diagnostics and registration with the basic unit. The temperature controller node within an extruder docking station e.g. is factory-coded with the information "19-mm extruder with a length of 25 D and 3 control zones". This code also comprises the admissible values for the operating range of torque and barrel temperature. The drive controller and the PC handle this information on their own by setting limit values or in the configuration schematic.

System check

During start-up and operation, all knots run a self-test on their own. In case of an error, they transmit a corresponding, clearly defined error code to the bus. This information can be displayed on the PC or used for remote diagnostics via a modem.

Digital intercommunication

In digital data transmission, the influence of external factors is much smaller than in analog systems. With a max. transmission rate of 0.5 Mbit/s, this network is suited for real-time transmission of events and actual values and can be considered a full but digital alternative for the old 20 mA current circuits.

Decentralized intelligence

The CAN bus system is a multi-master system with self-intelligent components. All modules to be integrated like controllers, sensors, etc. are just one node within a line of many more. A single bus line connect the nodes in whatever order. Each node is configured and definitely allocated to the corresponding docking station. Within the docking stations, the nodes are connected internally.

For installing your line, just plug a single communication line into the basic unit and get a highly reliable measuring system.

Event-oriented operation

The knots operate in an event-oriented instead of cyclic mode.

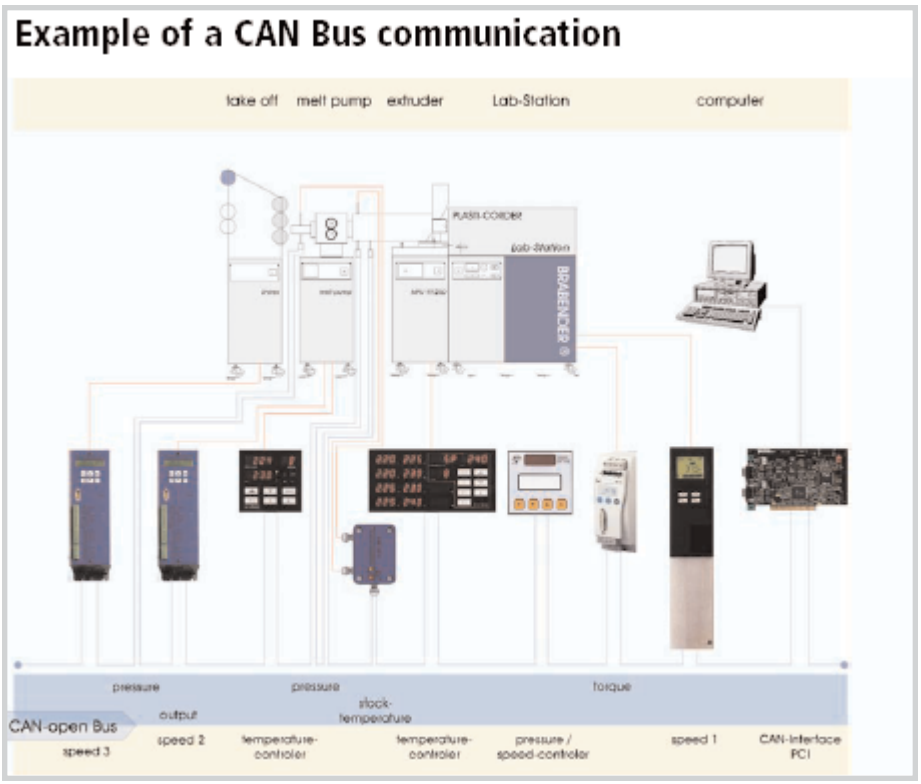
Transmission of the information "constant pressure" every 10 ms with a constant pressure makes no sense. The knot smoothens the measured values and only sends the current value to the bus if the limits are exceeded. This minimizes the bus load.

Scalable

The basic unit only comprises the knots of drive controller and torque measurement. All other knots are integrated within the individual docking stations. Each docking station brings along the components necessary for its operation. Scale up your system according to your special needs whenever you want.

Changing a measuring head is easy: just undock the previous one and connect the new one. Clean the previous measuring head under temperature

Example of a CAN Bus communication



Realistic production simulation on a laboratory scale

C.W. Brabender® - extrusion docking stations...

The Lab-Station with its multiple extruder measuring heads, various screw geometries, die heads, and downstream equipment enables extensive, intelligent, and comfortable instrumentation for raw material control and development and handles most different extrusion tasks.

The material to be tested is plastified in a practice-oriented way and extruded through the measuring extruder or Extrusiograph®. All measuring values like torque, melt temperature, melt pressure, and screw backforce (if requested) are registered continuously and displayed in the form of tables and diagrams parallel to the running test. The extrudate is tested for various criteria:

- Uniform plastification, gloss, gels
- Color dispersion and color check
- Transparency and formation of streaks, e.g. with transparent materials
- Swelling and contraction behavior
- Segregation of individual recipe components of a compound at the die and/or at the screw tip (e.g. titanium dioxide)
- Output per unit of time, etc.

Another important example for the multiple test methods are measurements with a rheometric capillary die head.

Continuous measurement of melt pressure (pressure difference), melt temperature and, within defined time intervals, material output provide all data for the rheological evaluation, i.e. the determination of the viscosity curve. Evaluation and calculation of the necessary corrections are done easily and automatically by the WINExt software.

Expansible - The twin screw docking stations - A survey

Profit from the flexibility and high performance of BRABENDER® twin screw technology for optimally adapting your processing machines for laboratory and small-scale production to various processing tasks. Realize all processing steps that are relevant to most different polymers (PVC, HDPE, LDPE, PP, PS, SAN, ABS, POM, PC, PA, etc.):

- Compounding
- Coloring
- Filling and reinforcement
- Homogenization
- Venting
- Batch production
- Thermo-mechanical degradation
- Polymerization

Compounding of additives like stabilizers, pigments, fillers, etc. demands for a maximum compounding effect. At the same time, additives frequently need to be dispersed.

Degassing of volatile matters (monomer and solvent residues, moisture, air inclusions, etc.) is basically a different task. Here, the aim is to reach a minimum residual concentration of these substances which, in some cases, is even strictly regularized.

Adaptation of the screw and barrel configuration to the different processing tasks is, therefore, a basic demand. Following the development in cylindrical twin screw technology.

BRABENDER® took these aspects into account already several years ago with the introduction of segmented screws and barrels.

Re-equipment and process technical modifications can now be realized quickly and easily.

Single Screw Docking Station 19/25 D

Twin Screw Extruder 20/40

expansible mixing docking stations...

C.W. Brabender® - mixing docking stations...

The Measuring principle

The measuring principle is based on making visible the resistance, which the sample material opposes to the rotating blades in the measuring mixer. The corresponding torque moves a dynamometer out of it s zero position.

In compliance with the existing standards and test specifications, a typical "Plastogram®" (torque and stock temperature vs. time) is recorded for each sample material.

Results display the relationship between torque (viscosity) and temperature/time in consideration of structural changes of the material. The measured data are displayed numerically as a table and/or graphically as a diagram during the running measurement on the monitor or on the display unit and can be printed and stores.

Applications

With BRABENDER® measuring mixers, you can simulate on a laboratory scale all processes like compounding, mixing, masticating, etc. that are relevant for production and processing of polymers and other plastic and plastifiable materials -- or use them for producing your sample material or for reactive processing.

The Materials

Test the processibility of:

- thermoplastics
- thermosets
- elastomers
- ceramic molding materials
- pigments
- and many other plastic and plastifiable substances

Blade Geometries

Select the optimum blade geometry for your special application from a large program of different blades

- Banbury
- CAM
- Sigma
- Roller

have proven successful in industrial application for many decades...

Technical Data

C.W. Brabender® • Lab-Station technical data

Specification	
Dynamometer	inverter drive motor
Power	12 kW
Torque	0 - 400 Nm
Speed	0.2 - 275 min^{-1} infinitely variable, digital display, optional 0.2 - 500 min^{-1} (torque 0 - 200 Nm)
Speed deviation	near 0 % (quartz precision through digital feedback)
Sense of rotation	forward or backward
Mains	3 * 380/400/415 V (adjust.) option: 3 * 230 V (transformer) 48 - 62 Hz, 3 * 32 A
Dimensions (W * H * D)	500 * 1100 * 900 mm
Weight	approx. 295 kg

Customer Satisfaction

C.W. Brabender® Instruments, Inc. provides unparalleled service and technical support for our customers by employing highly skilled trades-men, service technicians, and an experienced sales force.

We have a modern application laboratory located at our National Headquarters to benefit the interests of our customers. An experienced technician shall attend to the specific needs of each and every indi-vidual, and shall remain present throughout the entirety of the test and trial periods in order to assist in the customer's quest for desired results.

To arrange for a personal demonstration of the Lab-Station, contact the technical staff at C.W. Brabender® .

Discuss what WE can do for YOU...

C.W. Brabender® INSTRUMENTS, INC.

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