C.01

CONTROLS - PROCESS ORIENTED MODELS

Based on the Measuring techniques and the presentation of the measured process parameters, META offer a wide spectrum of controlls relying on process oriented methods. These controlls allow on the basis of the measurement results to influence the process parameters in such a way that
the process achieves always the strong quality standards.
On the other side with the implementation of process oriented controll META offer complete systems which guarandee to run the process in the best economical and efficient way.

PRINCIPAL OF CONTROL

The controll parameter is measured directly (e.g. thickness, moisture) or calculated from other measured parameters (e.g. bone dry weight, density).
The target value (set point) which is given by the operator will be compared with the measuring variable. This comparison yields a difference (controll difference) which is taken into account and input as controll parameter in the META control modell.
In the controll modell the target value for the actuator operation will be calculated. The actuator influences the process in such a way that the controll parameter will be equal to the target value. Then the controll difference will be minimized.
Process inherent time delays (e.g. time lags, dead times) are estimated on line and taken into account by the controll modell. All controlls can be switched from «automatic» to «hand» allowing so the operator to take control over the system at any time.

ERMOUPOLEOS 23, 18541 PIRAEUS,TEL: +30(010) 4834 755 / 48333866 / 0944296373, FAX: +30(010) 4834 754
VAT NO: EL 095607169 www.meta-automation.com e-mail:info@meta-automation.com
ALPHA BANK, ACC.: 144-00 2002 003468, IBAN GR68 0140 1440 1440 0200 2003 468

C.01

DDC-CONTROL

With the META-controll model a signal will be calculated from the controll difference taking into account the presence of the process disturbances and delays. This signal is output directly onto the actuator (e.g. valve). The technique is depicted in the Figure below.
This controll method is known as ***Direct Digital Control*** (DDC controll).

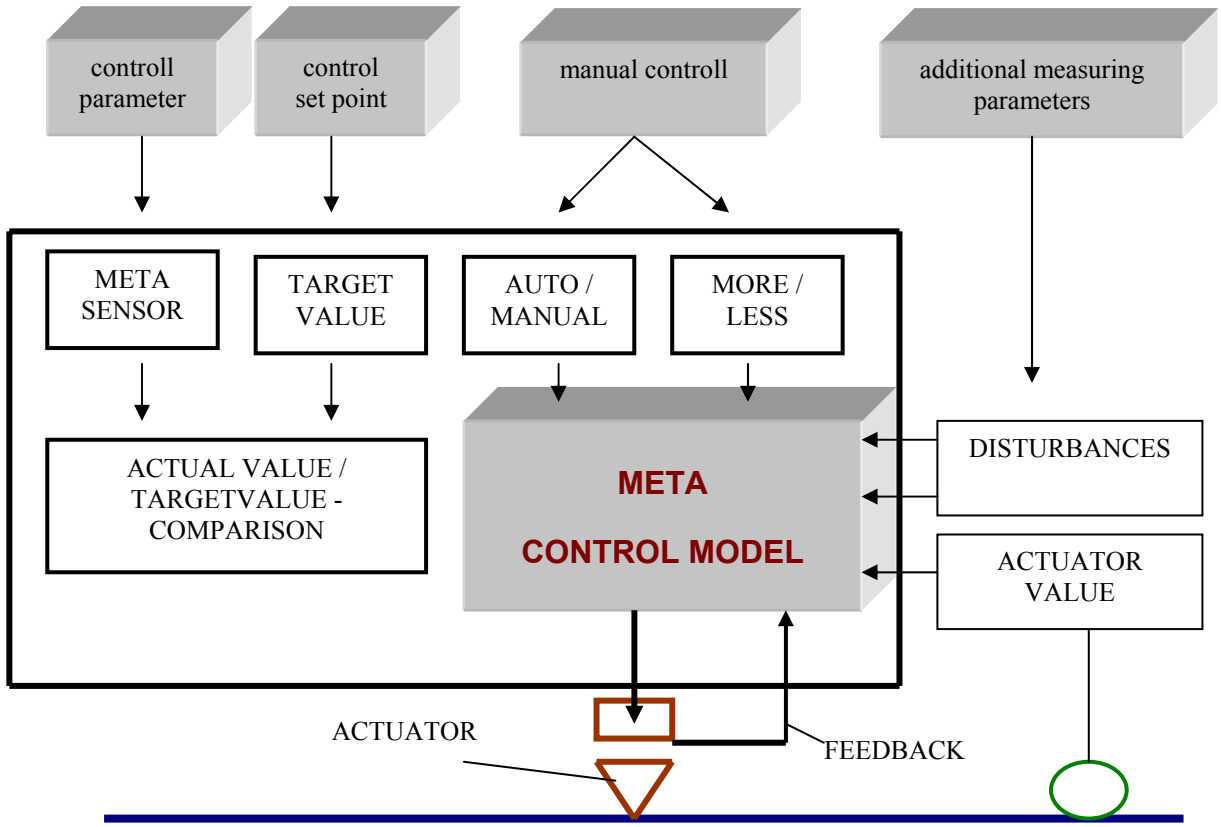

Fig. C01.1: DDC-control

C.01

SPC CONTROL

In contrast to the DDC technique by the instrumentation of SPC control, a stand alone independent controller is devoted to the actuator controll.

This controller acts on the actuator in that manner that the actuator value (flow, steam) a certain value achieves. This target or set point for the actuator will be calculated by the controll model as it is realized in the controll model.

The target for the controller is calculated from the control difference (comparison of the operator given set point for process) under taking into account the present process disturbances and delays.

Over a digital input on the system (META computer) the set point value for the actuator-controller will be changed.

This technique is known as ***Set Point Controll*** and is depicted in Fig. below.

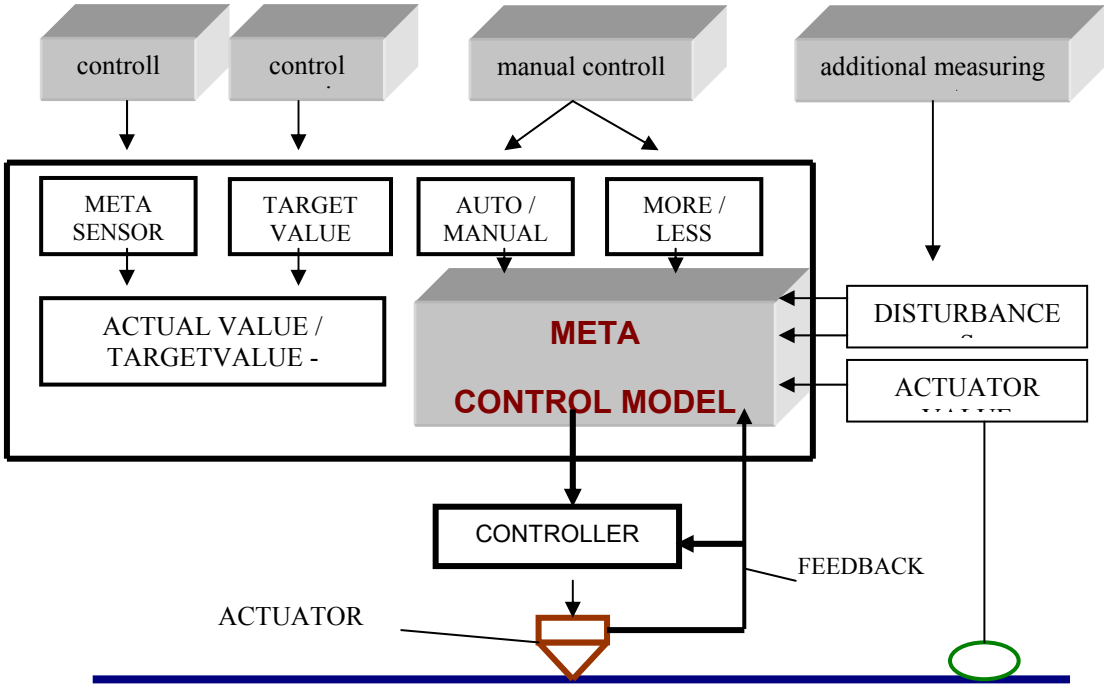

Fig. C01.2: SPC-control

C.01

COMMUNICATION BETWEEN SYSTEM-COMPUTER AND CONTROLLER BY SPC CONTROL

The communication interface between system computer and controller by the SPC-technique is standardized. There are certain signals for the communication defined. The use of the communication standard is strongly recommended in order to establish a *bump-free* change by switching from the computer controll to local controll (only stand alone controller is responsible) and vice versa. The necessary signals are depicted in the Fig. below.

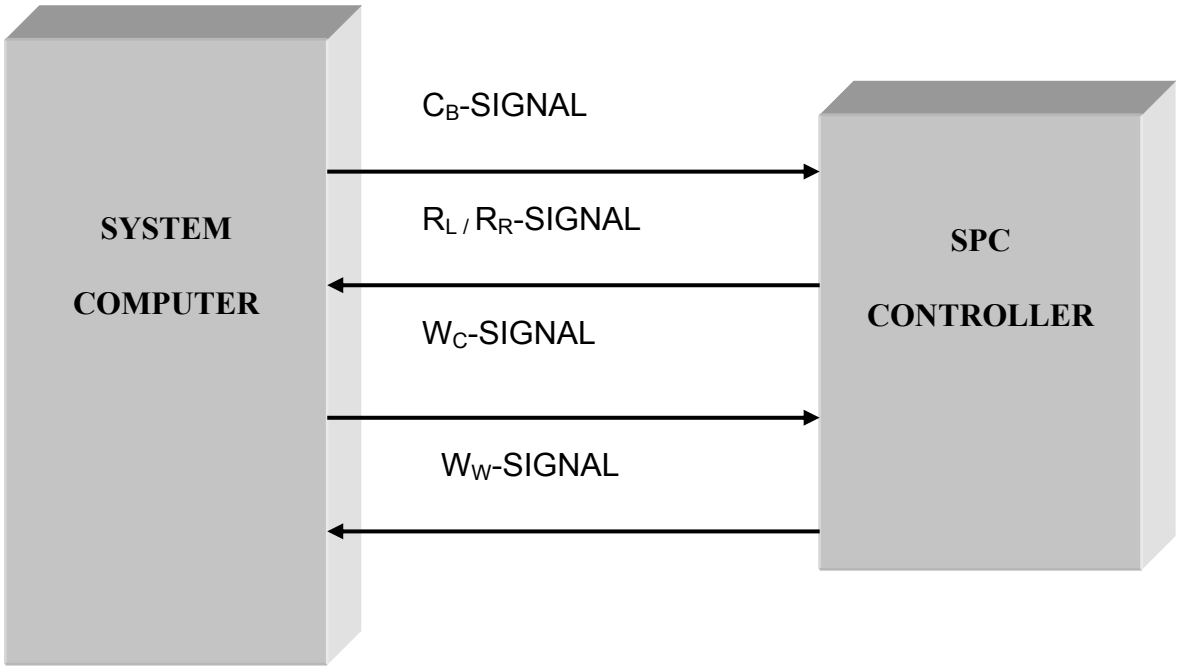

Fig. C01.3: Signal interface by SPC-control

C_B-Signal : This signal denotes to controller : **Computer Ready**

R_B/R_C-Signal : From controller is supplied the signal either **Controller Local** or **Controller Remote.**

Controller Local : Set Point for controller is only from controller-keyboard accepted.

Controller Remote : Set Point for controller is only from system computer calculated and accepted.

W_C-Signal : Set Point value (target value) coming from the system computer.

There are various accepted methods to send this signal.

One method is as analogue signal in range 0 to 20 mA or as 4 to 20 mA (life zero signal).

Other method is the PDM-Method (Puls Duration Modulation) and another the PAM-Method (Puls Amplitude Modulation).

W_W-Signal: This signal is necessary by certain processes and is the feedback of the transmitted Set Point from controller to system computer.

Also for that signal various accepted methods can be implemented as 0/4 to 20 mA signal or 0 to 10 V signal.