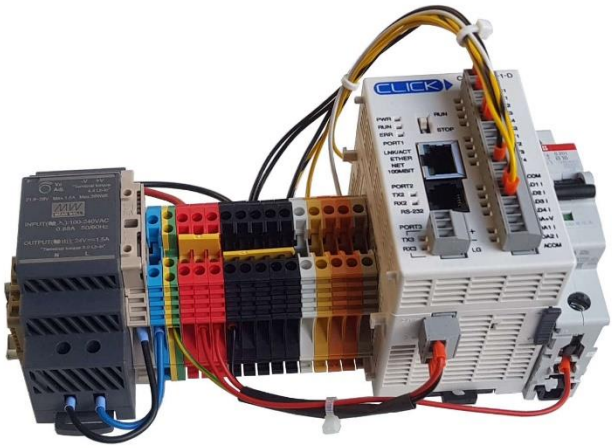
The MMAC **SimPLC Dual-A** Module

Features



The MMAC SimPLC Dual-A Module is a data station to combine measurements of the KxS DCM-20 Inline Refractometer with data of another sensor based on a different measurement principle placed in the same product stream. Generally Inline sensors determine one parameter – plus temperature, which influences most of the physical properties. If the stream contains more than one ingredient, then another suitable measurement method has to be used in addition, to solve the equation with two unknowns.

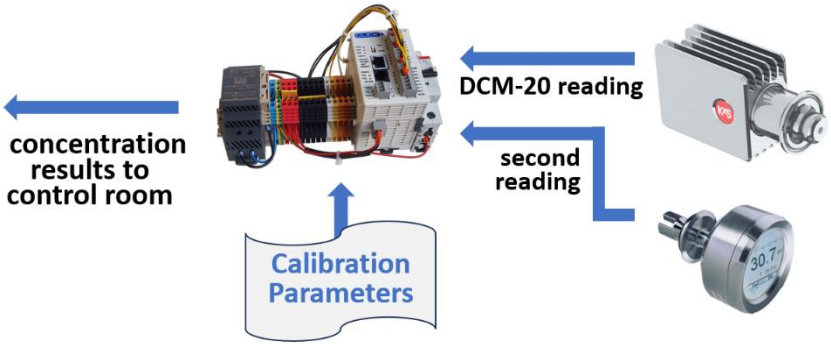
The difficulty in this approach is to combine the two independent measurements into one formula solving this multivariate concentration data set. Once the instrument is calibrated it collects partial results from both sensors and calculates concentrations of components present in the stream using the formulas derived from the calibration stored in memory.
The calibration takes into account linear and non linear dependences of signals from the detectors.

The MMAC SimPLC Dual-A Module is used in two ways:

(1) One is to grab field data from the process for separate building of field calibrations.
Upon pressing an external push button the current detailed readings (incl. temperature, pixel values, concentration results of both sensors) are collected and averaged over a time of about 10 seconds. Then the data are stored and can be retrieved from memory to build a model for a new or modified application.
In order to enter this data collection mode, the integrated switch is set to OFF.
Note: generally, calibration results are better, if field calibration data are taken directly from the process under normal operating conditions. However, most of the time it is not possible to vary an ongoing process enough to get sufficient data covering the whole variation span of all three variables (concentration A, concentration B, temperature). In case test measurements are performed in the lab and calibrations calculated on this basis, it might be necessary to finally adjust the results to match process readings to lab results by entering a bias correction, that can be entered into the memory of the SimPLC-Dual-A module.

(2) In normal operation (mode switch set to ON), the system will continuously (usually with a response time of two seconds) collect readings and calculate the concentration results. Result readings can be collected hrough ModBus or from the 4…20 mA lines.
Using the ModBus connection not only final results can be retrieved but also all raw data used during the calculation process.
The 4 … 20 mA output channels can be configured to represent the required span of result data.

Configuration of total system



Installation

The SimPLC Dual-A is delivered either in a system only form on a piece DIN rail with the idea to be integrated into an electronic enclosure. As an option also delivery pre mounted into a stainless steel enclosure is possible.

Accessories

The system when delivered includes: MSP-9000-005-RJ45-PW
M12 to RJ45 + power cable, 5 m; used as connection and supply for KxS DCM-20 sensor
It is advisable to connect the SimPLC Dual-A module to the system using an Ethernet switch.
Included: independent 24 VDC powers supply for field data collection.

Calibration

Calibration is done using set of calibration samples spanning the full range of the possible concentrations of the ingredients plus the range of temperatures the calibration should be valid for.
Field Data Lists to collect the data are available.
Building of the prediction models, based on data collected and summarized in the "field calibration data sheet", is done at the factory.

Technical Data

Data input:	RJ45 connection: Digital ModBus measurement results from the DCM-20 Digital ModBus signals from additional sensor or 2 x analog 4…20 mA input channels from additional sensor
Data output:	Digital result output from ModBus 2 x analog 4…20 mA output channels for results to control room Analog output may be configured to user selectable range
Ambient Temperature Range:	0 to 55 °C (operating range)
Ambient Humidity	30% to 95% (non condensing)
Environmental air:	No corrosive gases
Dimensions:	210 x 130 x 110 mm (B x T x H)
Power requirement:	230 VAC / 0,9A 50/60 Hz

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