

A P P L I C A T I O N N O T E

FOOD INDUSTRY

UNILEVER
Katowice



Supervisory and control system of
margarine plant

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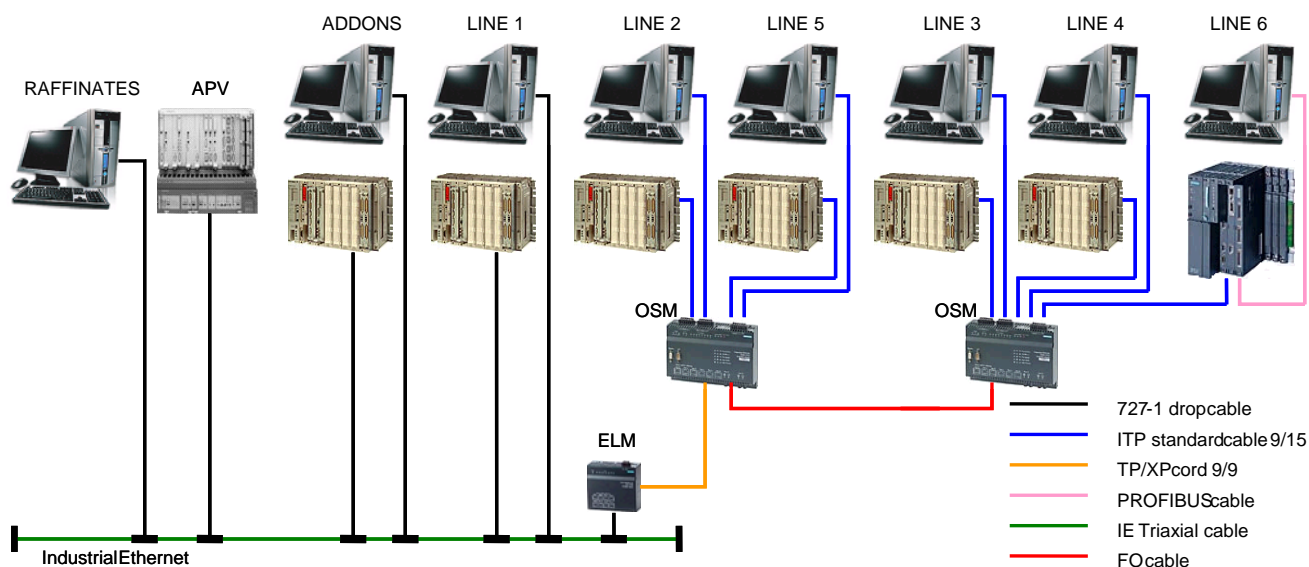
Supervisory and control system of margarine plant

Since 1997 **ASKOM** as a SIEMENS subcontractor has taken part in modernisation of margarine production lines in Unilever Plant, Katowice. The scope of contracts usually covers an engineering for control and supervisory systems.

At present, Unilever Margarine Plant located in Katowice consists of 5 process lines, additives preparation station and oil storage. Automation systems of all lines are connected with Industrial Ethernet network based on triaxial cables. The central part of system is computer for developing and storage recipes. Every one line is controlled by separate SIEMENS PLC with operator station equipped with WinCC SCADA software.

All control systems have been installed according to distributed architecture. The number of inputs and outputs of every SIMATIC controllers are listed below. In the table the quantity of software PID controllers and number of sequences could be found for every PLC. Emptying line of product residue, cleaning (CIP), sterilization, heating, freezing – that are the main sequential subroutines, carrying out by PLCs.

PLC	DI	DQ	AI	AQ	TOTAL I/O PER LINE	PID	SEQ
PREP.	360	408	52	22	842	5	24
LINIA 1	136	120	45	16	317	6	18
LINIA 2	152	136	40	18	1159	6	22
LINIA 3	140	112	56	16	324	7	18
LINIA 4	168	144	60	24	396	11	18
LINIA 5	96	80	40	12	720	6	19
LINIA 6	120	96	32	16	264	7	18
TOTAL	1172	1096	325	124	2717	48	137

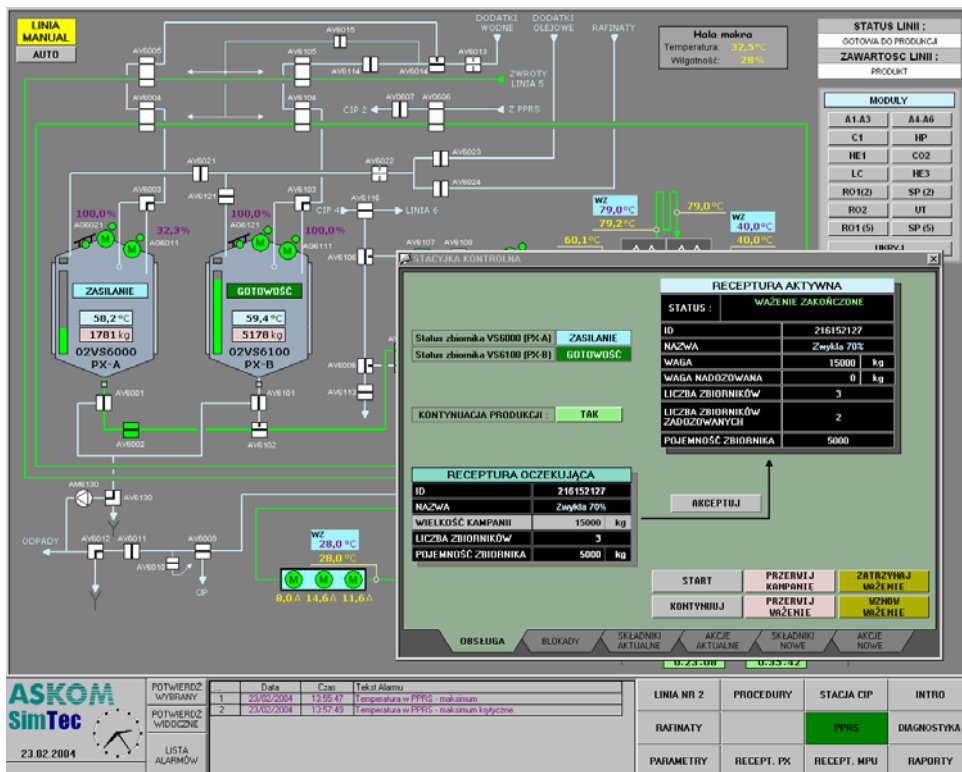
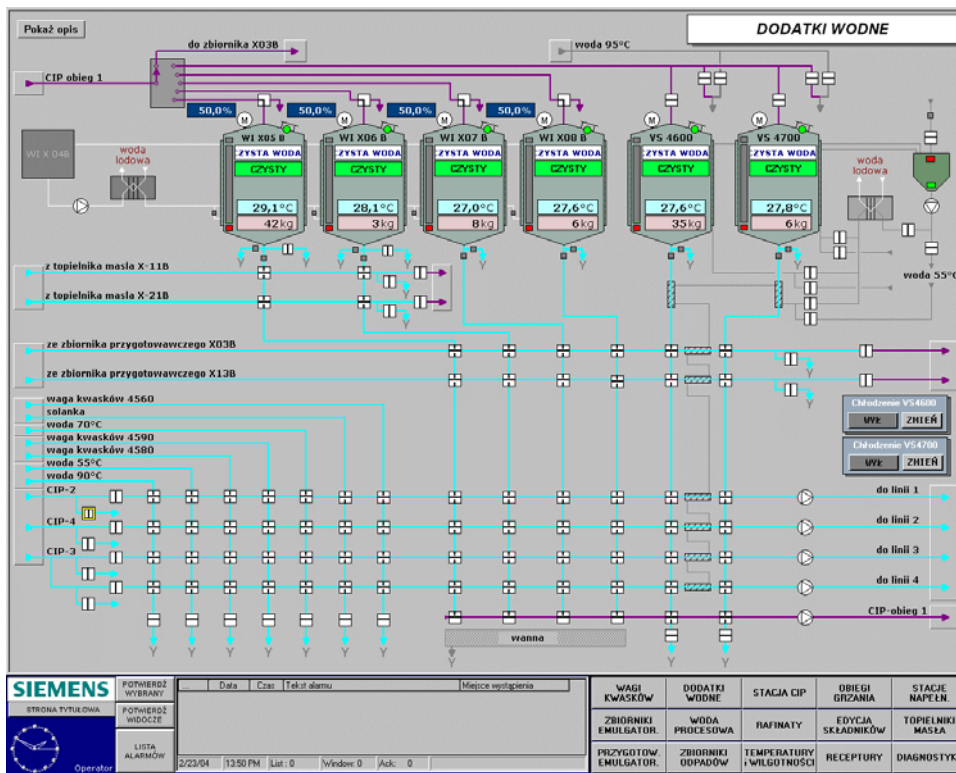


Recipes preparation

Two premix tanks (6000 kg capacity) was installed on every production lines. During normal work one of them is being filled sequentially with raw material (weighting procedures) since the second supplies production line. After emptying one tank and filling up the another, functions of the tanks are automatically switched over.

SQL data base system has been installed on recipes preparation station. It consist of about 200 premix (for semi-processed product weighing) and 200 final product recipes. Final product recipes contain also tolerance limits of deviations. 40 components could be taken into account and every recipe could be divided into 40 weighting steps. Recipe, that has been developed is sent to appropriate PLC.

Running of the recipe is controlled by PLC software. Before taking the very first step PLC executes subroutine of all compounds availability checking. There are possibilities of manual supervision by means of WinCC SCADA system. Running of recipe could be stopped at any point, or switched from automatic to manual mode.



Additives preparation area and margarine production lines

The main tasks of the additives preparation system are composing and storage semiproducts: oils, emulsifiers, acid solutions, milk, whey, brine and many more else.

Control system checks storage time and environmental conditions. If there is any raw material lacking, or quantity is too small to fulfil the recipe requirement, the supervisor is noticed.

In routine work composing of all ingredients takes about half an hour, since in manual mode it could take even three times more. Additives preparation area is equipped with two weighting tanks: water and oil one. They supply all technological lines, which work simultaneously.

The special software procedure was applicated for tanks reservation so as to minimize a lines idle time.

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Five lines are designed to various final products. Margarine could be packed in plastic cups, bottles (fluid oil), or simply in paper as a cubes.

