A Control System for Climate-Adapted Sprinkling of Saw Timber and Pulp Wood

ProLog is a complete control system for climate-adapted sprinkling of saw timber and pulp wood. The control system and its functions consists of technology which has been both practically and scientifically evaluated during several years of research. ProLog has been developed in co-operation with the forest industry, resulting in an effective and environmentally friendly method of sprinkling roundwood.

SPRINKLING BASED ON THE CONDITIONS OF NATURE

ProLog controls the sprinkling by taking into account the local climate at the mill. The climate is monitored using a climate station, built of high quality components, which will guarantee accurate measurements of the climate data required for the control function. These data are air temperature, relative humidity, insolation and wind speed. Additionally, the wind direction is monitored for a greater precision of the sprinkling control.

The climate data determine the evaporation capacity of the roundwood stored at the wood yard. Thus, the climate data is continuously used for calculations of the sprinkling intensity in accordance with Penman Monteith evaporation formula. The measurements are updated several times per minute, so that the sprinkling is able to closely follow the evaporation dynamics, i.e., the theoretical need of water in a roundwood pile.

USER FRIENDLY FEATURES

ProLog has a user friendly, menu driven software, which is accessed either by an interface or by an interactive process map at PC-screen. Both operation systems offer a number of functions that increase the operator’s understanding for ProLog and for roundwood handling as a whole.

ProLog consists of a PLC-unit (Programmable Logical Controller) that carries out sprinkling and process control. ProLog can be integrated with existing software for process control, e.g., by using our platform Citect for Win 95 and Win NT.

Print-outs regarding the sprinkling, climate, and alarms are readily provided by a printer. Using the Citect platform, all data from ProLog can easily be transferred to a database at PC for follow ups and further compilation of e.g. quality and environmental reports in accordance with ISO and EMAS certification systems. The process data can also be studied directly in Citect as clear diagrams and tables.
**BASIC SYSTEM**

The basic configuration of ProLog consists of a climate station, PLC, interface and printer. The basic system can control up to eight valves (sprinkling areas), supplied by one or two pumps. The sprinkling programs can be created individually for each of these sprinkling areas. Sprinkling with ProLog is possible in accordance with the following three working options:

1. **Automatic climate control** - the sprinkling is totally adapted to the climate. This is the normal option.
2. **Automatic timer control** - the sprinkling takes place intermittently. The intervals can be chosen individually for each sprinkling area. This option is occasionally used, e.g. when the climate station is being serviced.
3. **Manual control of pumps and valves**. In emergencies and during service, the sprinkling can be completely manually controlled via the interface or via control switches.

These three working options ensure that sprinkling always takes place and that the roundwood is adequately protected before processing.

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**SCIENTIFICALLY EVALUATED PROPERTIES**

ProLog has been designed based on results achieved in connection with a comprehensive research project mutually undertaken by the Nordic countries. This means that both the environmental and wood quality effects, resulting from the climate-adaptation, have been thoroughly examined and documented.

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**ENVIRONMENTALLY FRIENDLY WET STORAGE**

Scientific results show that climate-adapted sprinkling can prevent the negative influence of wet storage on the environment. Therefore, ProLog has been accepted by environmental authorities in Sweden as a suitable technology when assessing the environmental impact on the forest industry. ProLog offers an economic and raw material friendly alternative to sprinkling plants with recycling of sprinkling water.

By applying ProLog, the sprinkling intensity will vary on a daily basis, reflecting the weather conditions. Depending on the level of previous sprinkling undertaken, the water consumption will be reduced by 50 to 80 per cent without harming the quality of the roundwood sprinkled.

The amount of waste water will be reduced by a higher degree. This will result in the waste water volume being adapted to nature’s own capacity to degrade the substances, which have leached from the wood and bark.

The impact of waste water on the environment will therefore be significantly reduced.

The energy consumption and the wear of sprinkling pumps will also be reduced as a result of the strong reduction in water consumption.
CORRECT PROTECTION OF ROUNDWOOD

ProLog will adapt the sprinkling to the evaporation from the roundwood. Scientific results have shown that the evaporation on an hourly basis can exceed and, therefore, give better protection to the roundwood than timer-controlled sprinkling which, for instance, correspond to an intensity of 70 mm per 24 hours. By applying ProLog, the sprinkling can be controlled so that the roundwood will be protected from drying out and ensuing quality loss under all conditions! On the other hand, the unnecessary sprinkling will not occur at all when the evaporation is low, i.e. during the night and rainfall.

EFFECTIVE MONITORING

ProLog offers a possibility of continuous monitoring of the sprinkling system. An alarm, a printout of the cause, and an update of alarm database will be initiated when a disturbance occurs in the system. The documentation of the sprinkling is either made automatically or on request. Reports regarding the sprinkling during the last 24 hours are always printed out at midnight on the system printer. Other types of usage reports (e.g. weekly reports) can be printed out on request. Furthermore, all data from ProLog can be transferred to a PC/Windows environment and used in user specific documents in accordance with your working routines. Citect for Win 95/NT can be ordered as a complement.

SIMPLE TO APPLY

ProLog is simple to install in most existing sprinkling systems used by the saw and pulp mill industry. The basic version has been developed from the starting point that the most common requirements from our customers can be met. We can also develop customised solutions for installation, hardware and software.

TRAINING, SUPPORT AND SERVICE

A training package is included in the installation. This will ensure that your staff will fully learn about ProLog and that they will be able to take advantage of its many possibilities in your raw material handling. We can also provide you with additional professional education in control technique and raw material handling. A complete support facility and service program are included in your user licence.
REFERENCE INSTALLATIONS

ProLog was introduced onto market in 1995. Since then, the number of customers has rapidly increased both within saw and pulp mill industry. The saw mill customers include both contract mills and mills owned by forest companies. The annual production volume at these mills usually varies from 40,000 cubic metres of sawn wood and upwards. The volume of roundwood inventory at the mills varies between 5,000 and 30,000 cubic metres. Our pulp mill customers produce both sulphate and mechanical pulp. The inventory och Scots pine or Norway spruce pulpwood being sprinkled normally amounts to 50,000 -100,000 cubic metres. Please contact us for further information and a more detailed reference list.

TEKNISSKA DATA

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<th>PLC</th>
<th>Climate station</th>
<th>Interface (MMI)</th>
<th>Printer</th>
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<td>AEG Modicon 61200 Micro</td>
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