THE PRofile
No. 23
2003

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# Universal Bus Transmitter

*PRetrans 6350 with Autoswitch Function*

leader

In this edition of the PRofile we will be focusing on the characteristic traits of our product range and thereby of the day-to-day activities in our entire organisation – Rationality, Reliability and Flexibility. The rational aspect is ensured through a product range with relatively few modules offering solutions to a broad scope of applications. The advantage for the customer is that he will only have to maintain a very limited safety stock. Reliability means that the customer does not have to think about unforeseen production breakdowns, as interruptions in the production lines are very rare when PR modules are used. This is also the reason why we are able to extend a 5-year guarantee on all our products to our customers. Last but not least, the flexibility is reflected in the numerous application possibilities of our products and in our ability to deliver on a day-to-day basis – even when it comes to customised products. PR electronics is a company in constant development. During the past year we have concluded and initiated a number of activities to ensure the continuous strengthening of these three characteristics.

**Extension of Production Facilities**

We have just cut the first turf for an extension of our production facilities, which will give us 1800 new square metres distributed on 2 floors. This will primarily result in a rationalisation of production, stock, order configuration and dispatch, and the flow of products through the different departments will thus also become more logical. At the same time we will be extending our SMT line with Inline Screen print capability, improving our PCB and soldering quality even further.

**Updating of ISO 9001**

PR electronics has been involved with quality management from the very beginning and has been certified according to ISO 9001 since 1993. Now, 10 years later, new demands are being put forth, and we are still among the first companies to upgrade the standard and start focusing on customer satisfaction, process orientation and continuous quality improvements. In connection with the update we now also have an official quality manual which is available for download from our homepage.

**New Material Planning System**

In March we replaced our administrative system through many years with Navision XAL. With this new planning system, new possibilities in

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production planning and stock management are open to us, giving rise to higher flexibility in the production process.

**Focus on the Individual**

In addition to the three keywords characterising our products, we also have a fourth core value primarily concerning our employees – Humanity - that is the basis of all our activities. By treating all the employees in the PR group with respect and by taking up a serious attitude towards the working environment we hope to encourage all the members of our team to perform their best every day for the benefit of customers and company alike.

The cutting of the first turf on June 11th. Kim Rasmussen, left, and Peter Rasmussen, right, present the drawing for the extension of the head office in Denmark.

All these new initiatives are no reason for us to come to a standstill. On the contrary, we wish to continue our development while always keeping our keywords Rationality – Reliability – Flexibility in focus. Therefore, this edition of the PRofile gives you articles on our most recently developed product - PRetrans 6350 – as well as case stories meant to serve as an inspiration for obtaining the full benefit of PR electronics' product range for signal conditioning.

Peter Rasmussen
Managing Director

Contents

# 2231 at the ♥ of Combustion Control

***Aalborg Industries has gained a position as the world-wide market leader in marine boilers and welcomes the DNV type approval (marine approval) of the PR2231 trip amplifier.***

Aalborg Industries produces more than 100 large steam-atomising burners annually for the oil-fired MISSION™ OL and MISSION™ D-type boilers. These boiler types are typically installed on tankers and vessels characterised by large steam demands for cargo heating.

**Type-approved Trip Amplifier – to Be Safe**
The PR2231 trip amplifier from PR electronics A/S forms part of the safety systems in relay-based boiler control systems from Aalborg Industries. The function of the trip amplifier is to start and stop the feed pumps and to give alarm in case of high or low water level in the boiler drum. Aalborg Industries also uses the trip amplifiers in the critical water level and steam pressure-limiting devices that stop the burner in case of too low water level or too high steam pressure in the drum. Hence, the trip amplifier becomes part of the boiler safety system.

Safety equipment has to meet the tough, special requirements of the marine classification companies. That is the main reason why PR electronics has obtained type approval from Det Norske Veritas (DNV) for the PR2231 electronic trip amplifier.
Components with marine approval make life much easier for design departments as no further documentation is required for these components. Consequently, the marine approval saves valuable time in system layout and order processing.


**Increased Safety for the Marine Industry**
Marine approvals from Det Norske Veritas (DNV) on PR electronics' trip amplifier type 2231 and the universal transmitter PRetrans 5114 mean increased safety for the marine industry.

**Marine-approved Module for Critical Level Measurement**
The marine approval now allows the use of the 2231 trip amplifier for critical level control in boilers or other tanks where either a low or high level is critical and thus demands reliable signal conditioning even under extreme conditions, e.g. at high vibrations.

**Marine-approved Universal Module for Temperature Applications**
The programmable transmitter PRetrans 5114 is an excellent solution for several marine applications such as temperature measurement, galvanic isolation and conversion of mA or V signals. Therefore, PRetrans is ideal as a universal transmitter in many applications. The wide range of possibilities in one module makes for optimum servicing and stocking conditions both during the project phase and subsequently in connection with servicing.
Both products have been approved according to DNV's rules for ships, Certification notes no. 4.2

# International Product Catalogue on CD-ROM



We are proud to introduce the first edition of a complete product catalogue on CD-ROM. The product catalogue is an easy-to-use tool with language options in Danish, English (both British and American), French, German, Swedish, Italian, and Spanish. The CD provides smooth access to all relevant data such as:

- Data sheets
- Manuals
- Declarations of conformity
- Ex certificates
- UL, FM & CSA certificates
- Marine approvals

In addition to the data above, the CD-ROM contains software information and a brief description of PR electronics. The built-in search function of the CD-ROM catalogue presents the user with two possible approaches:

1) Search for a specific product number
2) Search for functions / applications

The function search groups the modules into 9 different application categories such as temperature, isolation, Ex barriers, frequency / pulse modules, etc. For each category the key features are presented in easy-to-grasp tables and from here the user can easily click his way to more detailed information on the specific module.
No matter which approach the user chooses, information matching the specific application can quickly be found. A straightforward and easy-to-use tool which is sure to come in handy...

If you are interested in receiving a copy of our new CD-ROM product catalogue, please give us a call or return the enclosed reply coupon.

# Analogue Bus Converter now also

***With the introduction of PRetrans 6350, the market obtains a favourable solution for conversion of RTD / TC temperature signals and mA / mV signals for both PROFIBUS® PA and FOUNDATION™ Fieldbus systems.***

The launching of the temperature transmitter PRetop 5350 for DIN form B mounting is now followed by PRetrans 6350 – a module for DIN rail mounting available in 1- and 2-channel versions.

**Features Offering Many Application Possibilities**
In addition to the mA / mV input, PRetrans 6350 also features inputs for all common types of temperature measurement, ohm signals from butterfly valves, solenoids etc., as well as a potentiometer input from e.g. level sensors. The module is thus ideally suited as a universal transmitter/converter for bus installations.
The transmitter integrates both PROFIBUS® PA protocol and FOUNDATION™ Fieldbus protocol. Switch between the two bus protocols is carried out automatically with PR electronics' AUTOSWITCH function! Each of the two protocols offers a number of unique features:

- Polynomial linearisation
- Transmitter calibration
- PID control
- LAS (Link Active Scheduler) with FOUNDATION™ Fieldbus
- Diagnostic tools

**Linearisation Functions Make for Application Adaptation**
Polynomial linearisation parameters make it possible to linearise the mA / mV signal and thus adapt it to the application. This function is typically used in connection with level or pressure measurement in tanks with a non-linear correlation between the actual measured value and the value to be displayed, as is the case with horizontal, cylindrical tanks.
In addition to polynomial linearisation, the transmitter is also equipped to perform table linearisations as standard. A number of points must then be entered into a linearisation table and these points form the basis of the correlation between the input and output signals. This type of linearisation is particularly suitable for simple linearisation problems where small deviations are acceptable.

**Further Information**
Call us for further details or order data sheets via the enclosed reply coupon

**Calibration of Sensor and Transmitter**
Transmitter calibration parameters make adaptation of e.g. temperature sensors possible. If the user wants a better accuracy than the general accuracy for standard sensors, the transmitter can be calibrated to match the specific sensor and thus optimise the accuracy of the application. As for all other PR transmitters, the calibration is carried out on the basis of a 2-point calibration.

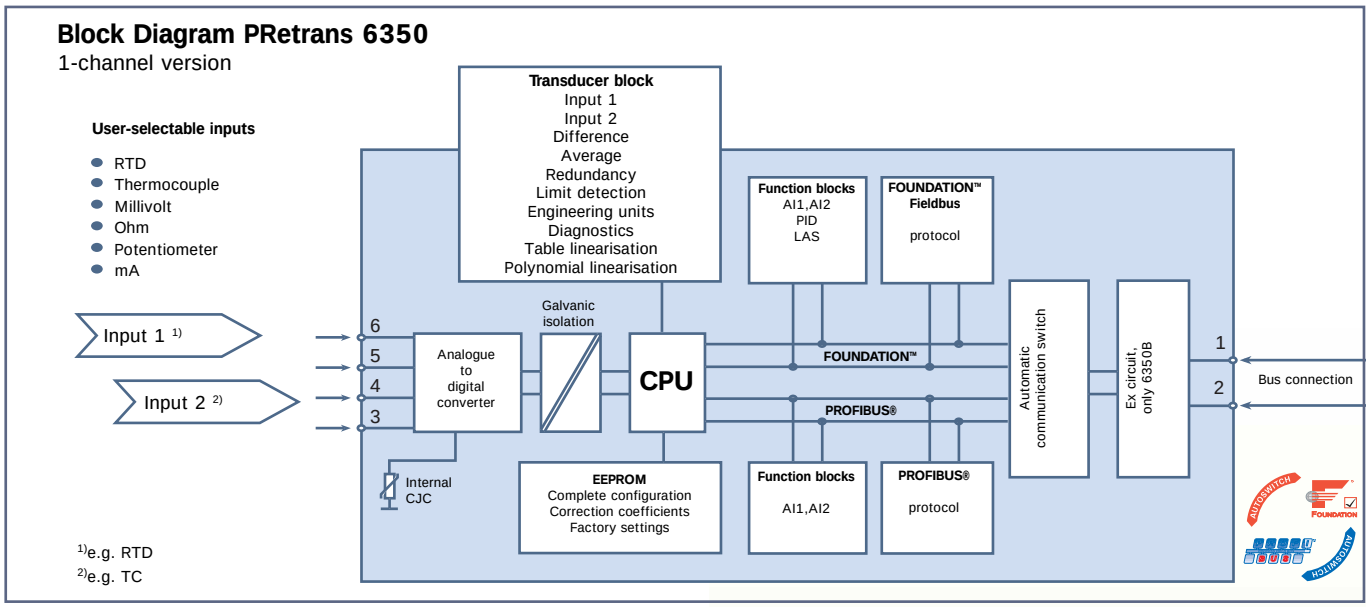
**Decentralised Intelligence**
Each channel has two analogue input blocks allowing the transmitter to perform redundancy, difference or average measurements when temperature input is selected. This feature makes the transmitter especially well suited for installations where a high degree of safety is called for – e.g. temperature measurement in boilers or steam systems in which the temperature of the medium is critical. Furthermore, PRetrans 6350 has a built-in PID function allowing direct adjustment of solenoids and butterfly valves.
With the FOUNDATION™ Fieldbus protocol the transmitter also features integrated LAS functionality allowing the module to take over control of the segment in which it is installed. Such a situation may arise in case of failure in the module assigned as the controlling unit.

**Diagnostic Tools for Troubleshooting**
The diagnostic tools allow the user to make an unambiguous diagnosis of any fault message. At the same time, the tools indicate sources of error and let the user know if the supply voltage is too low or if a communication failure to the master has occurred.

**For Standard or Ex Installations**
PRetrans 6350 exists in both standard and Ex versions. By virtue of its design and approvals, the Ex version of 6350 can be connected to all available segment couplers on the market. The transmitter is designed for both traditional barriers and FISCO barriers. The current consumption of the PRetrans 6350 is as low as 11 mA making it possible to connect up to 28 transmitters to each segment coupler.

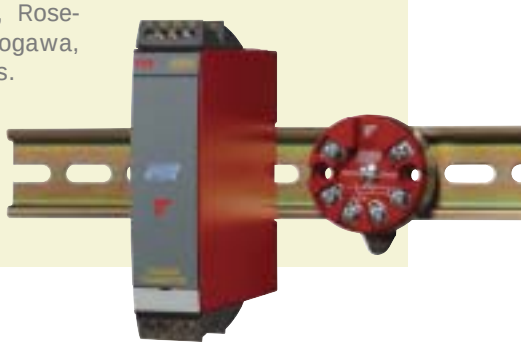
**Approved for Worldwide Use**
Approvals from CE, ATEX, UL, FM & CSA recognise PRetrans 6350 as proven and tested technology in all of Europe and in the USA and as is the case with all PR electronics' other products, PRetrans is covered by our 5-year guarantee. All things considered, there is no denying that PRetrans 6350 is a transmitter to be reckoned with!

# p for DIN Rail Mounting...




**Standardised Configuration for PRetop 5350 and PRetrans 6350**

Except the parameters for mA conversion, the function blocks of PRetop 5350 and PRetrans 6350 are designed in the same way. This means that they have the same functions and features. Both transmitters can be set up by way of the recognised host systems on the market, e.g. Siemens PDM®, Rosemount Delta V, Yokogawa, ABB and many others.



# Swedish Roads Monitored by PRetrans 6331A

***A very elaborate final test made the Swedish National Road Administration choose PR electronics as supplier of temperature transmitters. The high accuracy of the modules was decisive!***

The Swedish National Road Administration (SNRA) and SMHI (Swedish Meteorological and Hydrological Institute) operate a large number of weather stations throughout Sweden. The weather stations perform continuous measurements of road surface temperature, air temperature, wind velocity, and atmospheric humidity. On the basis of these measurements, the SNRA coordinates the effort of keeping the Swedish roads clear of snow and ice and sends out warnings of icy road conditions to the Swedish motorists via SMHI.

**Complete Control of the Entire Swedish Road Grid**
The weather stations contain sensors for measurement of the above-mentioned temperatures, wind velocity and atmospheric humidity as well as a panel with the signal conditioning modules. PRetrans 6331A is used in connection with the measurement of road surface temperature and air temperature. The module converts the measured values to galvanically isolated signals of 4...20 mA which are transmitted to the control system via the Internet. On the basis of the incoming data, the SNRA determines the need for snow clearing or spreading of sand or salt. The weather stations are strategically placed throughout the whole of Sweden so even local warnings are passed on to the Swedish motorists.

**Facts about PRetrans 6331A**
PRetrans 6331A is a 2-wire programmable transmitter for DIN rail mounting. The module is characterised by a uniquely low absolute accuracy of < 0.05% of span. Furthermore, PRetrans 6331 features cable compensation and programmable sensor error value, making it possible to diagnose measurement errors caused by e.g. cable breakage.

(Fact box): PRetrans 6331A is suitable for all temperature measurements where a 2-wire 4...20 mA signal is wanted on the output. In addition to the temperature input types Pt100, TC and Ni100, the module also allows conversion of mV signals and linear resistance signals. The module can be configured from factory or the customer can carry out individual set-up by way of PR electronics' programming software PReset. PRetrans 6331A offers a number of unique features such as:

- Extreme measurement accuracy (< 0.05% of span)
- Customer-defined linearisation
- Standard and Ex versions (Ex zone 0, 1 & 2)
- 1- or 2-channel versions (up to 84 channels per metre)

# Reliable Points Switch with PRetrans 5104

***cdsrail's demand to their new supplier was the equivalent of an ultimatum: Comply with EN 61000-4-5 – surge test at +/- 2 kV...***

The British company cdsrail designs and develops products for improved performance and reliability in the rail industry. cdsrails' systems are used for monitoring and control of railway assets.

**The Railway Standard EN 50121-4**

cdsrail uses fault detection and diagnosis techniques to predict faults in railway assets. One of the important measurements in this connection is carried out to ensure the correct placement of the points. For this purpose, load pins are mounted directly on the points, sending a 4...20 mA signal to the monitoring system. In order to ensure a faultless transmission of the signal, the PRetrans 5104 is mounted as a galvanic isolator between the load pins and the monitoring system. As safety is an indispensable aspect of all cdsrail's products, it is of crucial importance that all components comply with the railway standard EN 50121-4. Among other things, this standard deals with the ability of the products to operate in surroundings where energy-loaded transients may occur. These transients (disturbances) come from e.g. contactors which are typically used in point machines. Failure in the points, e.g. because of outside disturbances, may have catastrophic consequences.

**Only One Supplier Passed the Tests...**

The demand to the supplier of galvanic isolators was an unconditional compliance with EN 61000-4-5 requiring the inputs to be surge-tested at voltages of +/- 2 kV in a 3-metre radius from the modules. cdsrail tested products from a number of suppliers and PR electronics was the only one to fulfil this particular requirement. The high surge level is a result, among other things, of PR electronics' STREAM SHIELD technology – a patented principle ensuring optimum operation conditions in even the worst environments.


**Surge Test**

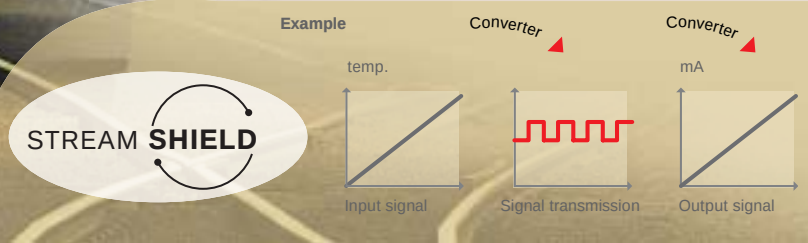
EN 61000-4-5 (surge test) was added to EN 61325 (the EMC directive) a few years ago. It has thus become a legal requirement that all products delivered within the EU comply with the tests specified in EN 61000-4-5. Since 1991, PR electronics has developed products fulfilling both EN 61000-4-5 as well as other standards successively introduced into the EMC directive which came into effect on 1 January 1996.

**STREAM SHIELD...**

... has been developed and patented by PR electronics. This is a new technology acting as a shield and efficiently protecting the signal against outside disturbances.

How does it work? It is simple, and yet complex. Here is the simple explanation:

A converter modulates the incoming signal to a stream of bits. Via a so-called phased-locked log-in filter the STREAM SHIELD technology protects the bits against outside disturbances, thus allowing the demodulated signal to be converted to an analogue or a digital output signal with an extremely high degree of accuracy.



# Reliable Power Supply for Remote Mountain Tops in Greenland

***Flexibility and operational reliability were the keywords when the switchboard manufacturer System Teknik selected suppliers for the renovation of TELE Greenland's repeater stations in Greenland.***

System Teknik, which is one of Denmark's largest switchboard manufacturers, has now completed renovation of the first 7 repeater stations out of an expected series of 42 for TELE Greenland in Greenland.

"The repeater stations (radio-relay stations) are situated on mountain tops at intervals of about 50 kilometres on the west coast of Greenland, from Nanortalik in the south to Uummannaq in the north. They handle all the daily communications in Greenland from ordinary telephony and radio / television signals to coast radio and mobile phone signals and now also the Internet" says Sectional Engineer Steen Grossmann who is in charge of the project for TELE Greenland.

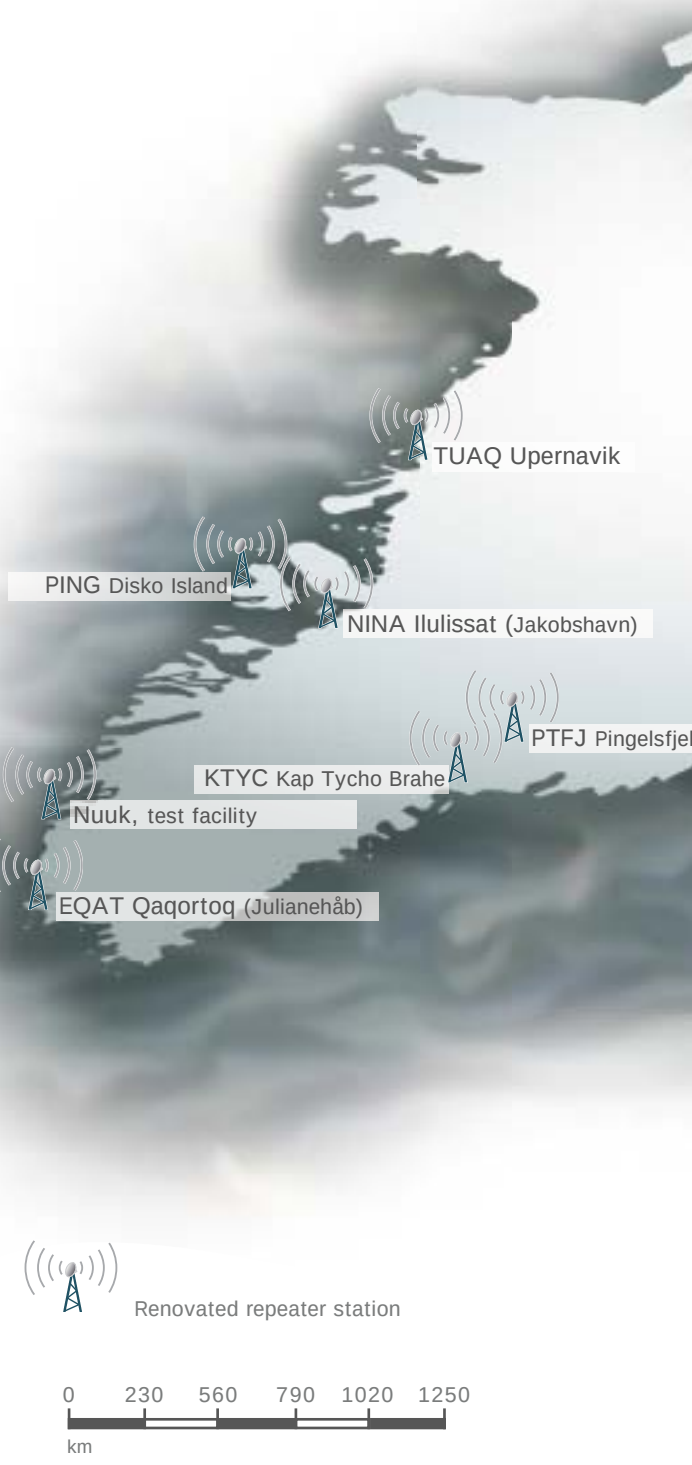
**PR Modules for Surveillance of Battery Charging**

System Teknik has chosen PR electronics as supplier of signal conditioning modules – including signal conversion and alarm functions. The PR modules are used in connection with the repeater stations' power supply, which primarily consists of solar cells charging a number of 48 V lead batteries. The stations can run for about one week on the batteries without recharging, and if the sun still does not shine, a diesel generator is started. The PR modules perform current, voltage and temperature measurements as the charging of the lead batteries is temperature-compensated.

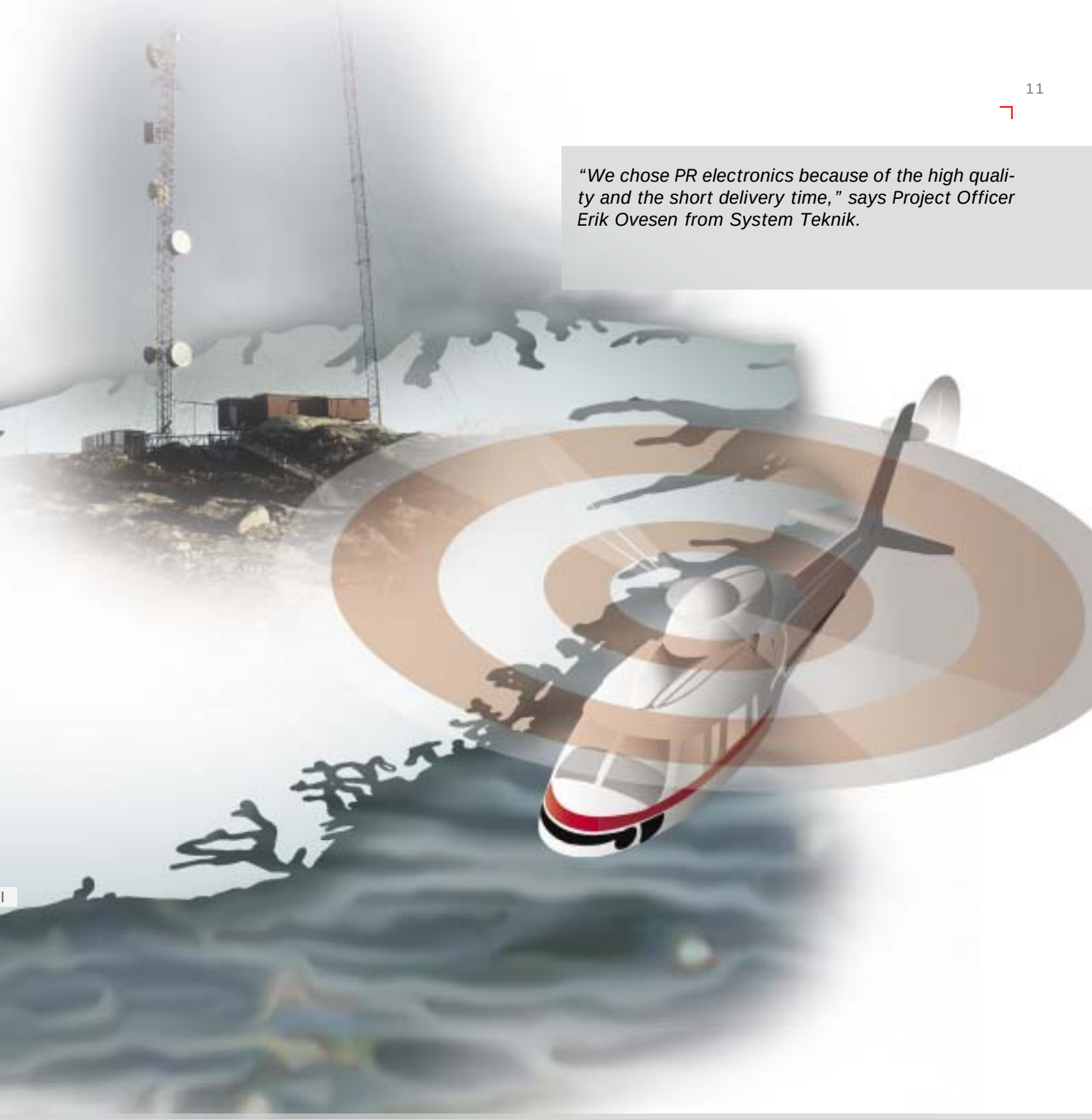
**Power Consumption Reduced to a Minimum with Pretrans 5114**

Seeing that the repeater stations' primary source of power is solar energy, a reduction of the power consumption to a minimum is very much in focus. As a result, all equipment not in use is turned off. For instance, the PLC controlling the generator is switched off when the generator is not running. PR's programmable transmitter 5114A handles all functions and was chosen because of its high flexibility. For TELE Greenland it is of great importance that it is only necessary to stock one module to perform all control functions.

In addition to PRetrans 5114, the trip amplifier PR-2231 is used as a safety device in case of failure in the PLC controlling the generator.



*"We chose PR electronics because of the high quality and the short delivery time," says Project Officer Erik Ovesen from System Teknik.*



**Facts about PRetrans 5114**

PRetrans 5114 is one of PR's flagships when it comes to application possibilities. This flexible transmitter gives the customer obvious advantages in terms of reduced costs for spare parts and maintenance as one module replaces several single-function modules.

The many different input options include temperature (RTD, TC, Ni and Lin R.) as well as mV, mA and V. Other features are a 2-wire transmitter supply and current / voltage outputs which can be configured as desired in the ranges 0...20 mA / 0...10 VDC. The configuration is carried out via the user-friendly PReset programming software; alternatively, a customer-defined configuration can be delivered from factory.

Another specialty of the PRetrans 5114 helping to reduce the costs for spare parts and maintenance is the possibility of selecting the power supply anywhere in the range 24...230 VAC / 250 VDC. It is thus no longer necessary to consider which type of supply is available in the installation area.

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FAIRS


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| **Oct. 02 2003**<br>IMC @ Barry Island | Cardiff | Wales |
| **Oct. 08-11 2003**<br>Elektrotechnik | Dortmund | Germany |
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