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MAJOR TRENDS



New generation of circuit-breaker monitoring

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 ASSET MANAGEMENT  DIGITAL SUBSTATION
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Life management of substation equipment is a key economic factor for utilities. Hence the need for an effective and all-embracing monitoring system – one that can anticipate failures and thereby enable utilities to switch to triggered maintenance.



1 comment



CBWatch3 online monitoring system for circuit breakers

Asset health is an economic imperative that determines a utility's return on investment. It also impacts power quality, reliability and availability. But to measure asset health requires a host of real-time data. The first stepping stone in acquiring that data and transmitting it in real time is the latest generation of circuit-breaker monitoring devices.

Alstom's CBWatch3 is an example of such an online monitoring device. Other than its advanced circuit-breaker monitoring functions, CBWatch3 is digital-substation ready. "This is very important," says Jean-Luc Rayon, AIS & GIS Electronic Products Manager. "Thanks to its native IEC 61850 compliance and standard CB modelling, the user is assured of its interoperability – the device is directly connected and interoperable with the digital control system and the client's asset management software tool."

Modularity, simplicity and standard components

Utility priorities are frequently expressed in terms of cost optimisation and flexibility. "A modular design will meet those demands," notes Rayon. "In

the case of CBWatch3, the basic level covers gas monitoring. It continuously measures gas pressure and temperature and calculates gas density. Importantly, it keeps a historical database so that it can calculate short- and long-term gas leakage rates and extrapolate future density.” The second level covers full circuit-breaker monitoring, measuring drive performance to detect mechanical deterioration such as friction, corrosion, spring fatigue and damping failures. Level three includes hybrid modules monitoring (circuit breakers and disconnectors) and gas-insulated switchgear. “Depending on utility needs, modules can be added to provide new functions.”

Ease of installation is also an important attribute for new-generation circuit-breaker monitoring devices. CBWatch3 is designed for quick and easy installation on the circuit breaker marshalling box, with direct frontal connection. “And since it is easily connected to any kind of circuit breaker, it is suited to retrofit applications,” Rayon adds.

The use of off-the-shelf components keeps costs low and aids simplicity. And the integration of ProWatch, the universal platform for monitoring and control of air- and gas-insulated switchgear, assures consistency. “We will use the ProWatch processor for future monitoring products,” confirms Rayon.



ProWatch, the universal platform for monitoring and control

Circuit-breaker modelling, asset health and maintenance index

All the online condition monitoring data collected by CBWatch3 are collected and used to construct two indicators – the asset health index (AHI) and the asset maintenance index (AMI). These, in turn, are consolidated with AHIs and AMIs from other devices to produce health and maintenance indices for the whole substation. These substation indices can then be integrated into an overriding asset management system such as Alstom's **e-terraassetcare**, which analyses the information

and enables the utility to make fact-based decisions on global and device-specific replacement and maintenance strategies.

ALSTOM CBWATCH 3 INTERFACE

Measures Settings Downloads Language

Gas monitoring Cabinet temperature Maneuvers monitoring Opening maneuvers Closing maneuvers Comtrade parameters

data.msct=2&ssct=0&rfsh=0

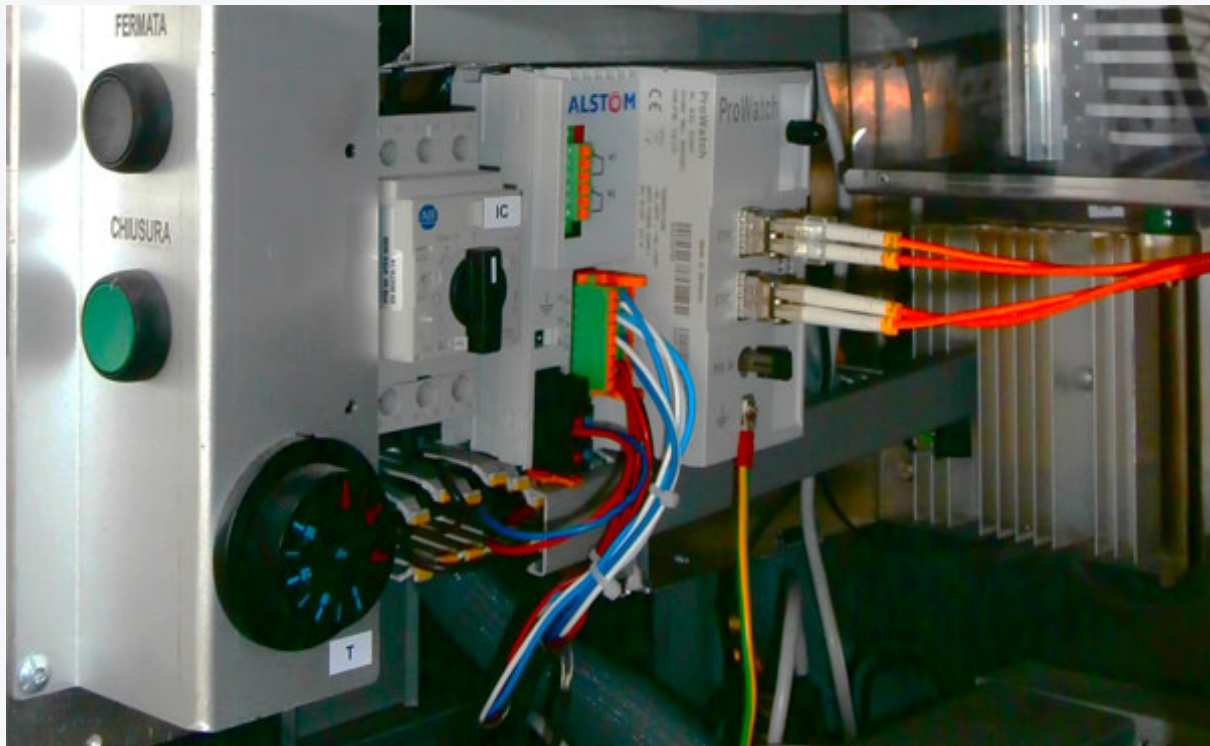
SF6 volume number	<input type="radio"/> 0	<input checked="" type="radio"/> 1	<input type="radio"/> 3
gas type			
SF6	<input checked="" type="radio"/> SF6+CF4	<input type="radio"/> SF6+N2	<input type="radio"/> Air
alpha gas ratio	<input type="text" value="6.00"/> %	init pressure	<input type="text" value="6.00"/> bar
Pressure at 20°C threshold 1	<input type="text" value="6.000"/> bar	min threshold 1	<input type="text" value="6.000"/> bar
Pressure at 20°C threshold 2	<input type="text" value="6.000"/> bar	min threshold 2	<input type="text" value="6.000"/> bar
Pressure min at 20°C threshold 3	<input type="text" value="6.000"/> bar	min thresh	<input type="text" value="6.000"/> bar
Gas P20 Short/Long-term tendency	<input type="text" value="Short-term"/> Short-term	if SF6 pressure at 20°C is under this min threshold 2 of pressure, we set an alarm (5.000<x<5.100)	

Submit

CBWatch3 interface

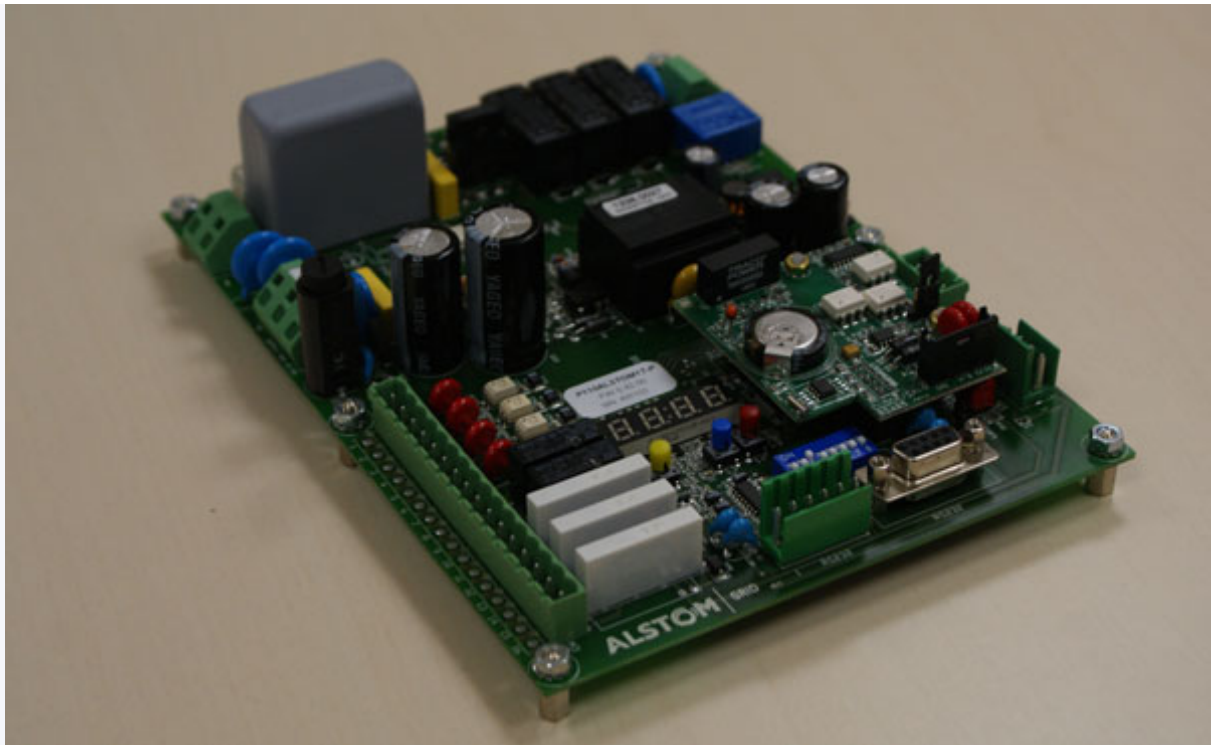
DWatch – a smart mechanism for monitoring and control of disconnectors

DWatch is to disconnectors what CBWatch3 is to circuit breakers. DWatch Proxy is a new device to make an existing disconnector inside a substation ready for the IEC 61850 protocol.



DWatch - Disconnecter monitoring system

Eros Stella, Alstom Product Development Testing/Certification Engineer, explains: “DWatch Proxy converts information coming over a digital link into a standard protocol to communicate with DWatch. It is based on the same ProWatch processor used in CBWatch3, making use of its fibre optic converter. It translates the information from all three ProWatch electronic boards and vice versa from substation to disconnecter. As DWatch records each operation and stores all disconnecter information over its entire life, DWatch Proxy transmits the data to the substation to manage the dynamic range.



ProWatch electronic board

“This is the first time a disconnecter has had digital capabilities thanks to DWatch, while it also features dynamic range functionality using wireless technology embedded in the live part,” says Stella.

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