

The latest developments in RDS4Marine

Remote diagnostics for the marine industry

The ABB RDS4Marine system has been deployed in its latest release, version 5.1. The following is intended to provide a general overview of improvements, the thinking behind changes made, and a brief instructional guide.

New system functionality in RSD4Marine 5.1

A chat option guarantees there will be no misunderstanding while communicating with the crew onboard over remote desktop. An intuitive user interface makes it easy to switch between remote and local on board users while typing sentences. The entire chat is always stored in the local RDS database and can be put back to the screen whenever needed. In addition there is a site comment option, facilitating the recording of all maintenance actions performed by the local crew on the equipment being monitored. This is an excellent way of keeping track of what service actions have been carried out and allows planning of future maintenance actions with better accuracy.

DriveDebug mode is an answer for demands from ABB drive commissioning engineers for better use of the RDS system while drive commissioning. They required a much higher sampling rate that the normal monitoring mode through DriveOPC could provide. After switching to Monitor tab, the user can select DriveDebug mode that would deactivate standard

monitoring scenarios for drives but at the same time allow to select ad hoc interesting signals from the drive and monitor them with sampling resolution of 2ms per signal. After fast monitoring is complete, data collected by the RDS can be stored to a database and the system can be set back to normal operation.

With each installation of RDS system there is a predefined number of self monitors that act as a watchdogs to monitor the performance of the RDS itself, like CPU load, memory consumption, specific processes and services behavior, as well as checking connectivity with external devices such as drives, controllers, and other RDS computers. With simple customisation and adjustments, the IT RDS responsible can set the time intervals for various tests and see the online status of the installed base in the RDS dashboard.

There are many more improvements in addition, such as an improved calculation engine, support for multiple DDCS cards, improved time synchronisation for frequency converters, and extended configuration wizards.

Cost effective and scalable hardware

Optimised software requires adjustments on the hosting hardware side as well. The aim is to minimise the number of computers wherever feasible. The new cabinet includes a high performing Panel PC that can host multiple monitoring configurations for switchboard, DGMS and rotating equipment. External RUSB for communication with the drives that can be installed inside the cabinet are also included together with Panel PC, resulting in a high performing, cost effective RDS hardware solution for a multi-drive system such as drilling or jack-up drives. In order to tighten security, an additional RDS firewall configured to allow for RAP communication traffic only is also included. This firewall has also 3G capabilities that may be activated for remote support from office during RDS commissioning in the yard, as well as acting as a main connection to the Internet if a customer satellite solution is lacking (e.g. in the tug market or small vessels operating close to shore such as the US Great Lakes fleet).



New system functionality

Enhancements for new and existing assets in monitored portfolio

Monitoring of frequency converters has a new functionality
BlackBox upload, which is very useful in the case of Medium Voltage (MV) drive monitoring, brings even more detailed insight into conditions and internal recordings of the drive during trip occurrence. Black box is additional memory embedded in the MV drive that continuously collects very detailed parameters and events from the main control board. In the event of drive trip, those measurements are dumped into file that can be imported into the RDS system to display on the same UI as all other recordings acquired by the system.

Improved time synchronisation between RDS and ABB drives

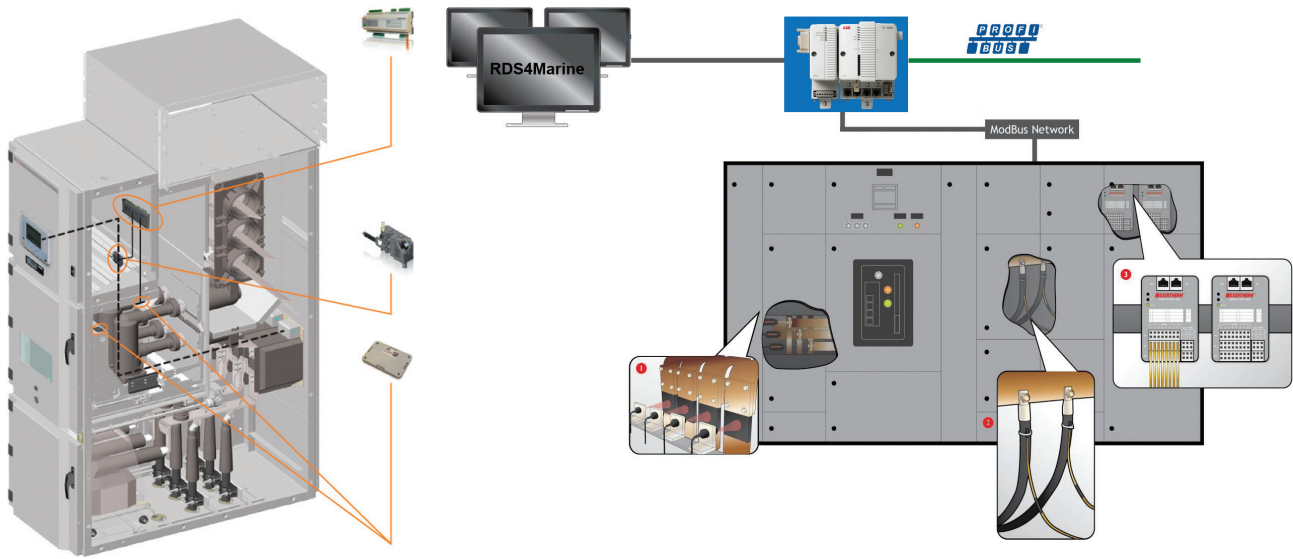
The variety of control boards supported by RDS required individual approach for time shifting and time stamp adjustments for faults and data loggers fetched by the RDS. At present, the mechanism is tailored for the MV drive AMC boards with real clocks and absolute time stamps, as well as for LV RMIO boards where time can be represented in absolute format as well as relative (number of ticks after drive was powered on).

Parameter reading for RELION protection relays

The RDS monitoring solution for RELION-type protection relays enabled periodical reading of all parameters exposed by the embedded IED web server over http protocol. In particular, a software version, protection function settings and the outputs of condition monitoring block for the main circuit breaker are recorded in RDS.

Integration with MySiteCare

Diagnostic solutions offered by the PPMV service department, named MySiteCare and MyRemoteCare, are now integrated on board with the



Enhancements for new and existing assets in monitored portfolio

RDS system. Measurements acquired from the switchboard by MySiteCare hardware are then processed by the MyRemoteCare gateway, and results are posted to an RDS computer installed on board that automatically forwards them to the MV Switchboard factory service centre in ABB Italy. From that moment, an expert team from the MV Switchboard division is able to analyse the data and provide a periodic maintenance report to ABB Marine that is merged with RDS reports and sent to end customer.

Diagnostic solution for bus bar and cable joints infrared temperature monitoring

A solution that answers market needs for online temperature monitoring of MV and LV connectors. In order to avoid costly human inspection with use of infrared cameras, cost effective online monitoring solution using Exertherm infrared sensors are proposed. Switchboards, motors and generators can now be equipped with

the IR sensors connected through data cards to RDS, either directly or through controllers (gateway or DCU). In the end all temperature readings (multiple measurements per single SWBD panel) are recorded continuously by the RDS and can be used for periodic reporting and early warning if temperatures deviate from their normal state.

Release of Diagnostics for Machines package

A long awaited launch of the Diagnostic for Machine package is hitting the market. Already deployed for a pilot retrofit project and few newbuilds, it offers an enhanced condition monitoring solution for critical machines such as propulsion and thruster motors and main generators. Based on the hardware and software integration of MachSenseR with RDS, the on board infrastructure facilitates integrated data flow and analysis, starting from the sensor (vibration, current and voltage) up to the main RDS computer,

where condition monitoring analytics are fired. Measurements from MachSenseR are triggered by the RDS under precisely defined operating conditions to normalise the calculation results. Some raw readings as well as end results are automatically sent to our Service Center databases to feed periodic reports.

Cyber security enhancements

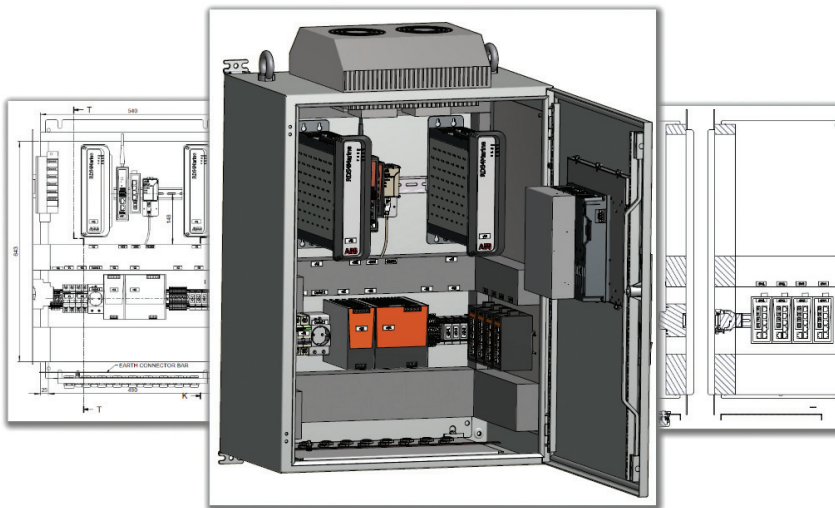
In order to address stricter cyber security requirements set for ABB products, RDS4Marine has been assessed against all possible aspects of cyber security as defined by ABB. Some immediate actions such as documentation and hardware update have been already taken, resulting in enhancements released in version 5.1. Additional topics have been identified and will be progressively addressed in consecutive releases of RDS systems. The project delivery and service organisations will continue to follow up cyber security requirements.

RDS dashboard deployed with Integrated Operation Center at Billingstad

Started at the end of 2014, the development of RDS dashboard was initially aimed at creating a portal for ABB's internal RDS operational personnel. The goal was to provide a single screen overview of all RDS with the location of ships and status of both monitored equipment and the RDS system itself. The first release of RDS dashboard got

very good feedback from users, and a second generation of RDS dashboard has now been developed, using myABB technology and sharing the common Marine Portal landing page.

With the recent launch of the Integrated Operations Center at ABB Marine Norway, Billingstad, RDS dashboard found its key role in providing immediate overview of RDS installed base and status of all customer assets monitored within RDS service contracts.



Cost effective and scalable hardware

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The fundamentals of RDS were previously addressed in the 2013 issue of Generations, in the article "Remote Diagnostic Services – always on board".