

Harmony Benchmark and Fingerprint Opportunities for system performance improvements

The Harmony Benchmark and Fingerprint provides a comprehensive diagnostic analysis of the Harmony rack control system. Performance, configuration and life cycle parameters are read from the installed system and compared to requirements and best practices. Non-optimal system states and settings are automatically identified. As result, the Benchmark report provides a quick overview of the system status, and the Fingerprint report presents the evaluated findings and detailed recommendations for improvement.

Observing typical systems

What we might see in running control systems:

- System overload is causing slow response rate.
- Non-optimal system settings and conditions often do not cause incidents immediately, but might result in disturbances over time.
- Gradual system performance degradation is not diagnosed or resolved until issues arise.
- Issues arise sporadically which are difficult to diagnose.
- Non-matching firmware versions after the last system update or upgrade.
- System efficiency losses due to wrong parameter setting in communication interfaces.

Revealing unseen weak spots

As a first step of system analysis, portable easy-to-use data collection software, which has been developed on the basis of long-term service experience, is executed on the servers in the Harmony control system. It runs in the background on a low priority level, in order not to strain the system in operation, and produces a packed result file.

The second step is to log in to the “myABB” web portal or onto *ServicePort* and upload the result file manually, thus keeping the workflow strictly under the end user’s control.

No.	Node ID	Node LS/FMS Firmware Status	Loop Channel 2 Receive Error Rate %	Node Output X8 Saturation %	Node Memory Utilization %	Node I/O Bus Saturation %	Received X8s per Packet Since Reset	LS Poll Busy NAK Count	Node Input X8 Saturation %	Excessive Incoming GWM traffic (avg/sec)	Loop Channel 1 Receive Error Rate %	Average Node CPU Utilization %
61	DefaultIDCS Loop_12 Node_22	Y	G	G	G	G	G	G	G	G	G	G
62	DefaultIDCS Loop_12 Node_24	Y	G	G	G	G	G	G	G	G	G	G
63	DefaultIDCS Loop_12 Node_25	Y	G	G	G	G	G	G	G	G	G	G
64	DefaultIDCS Loop_12 Node_3	G	G	G	G	G	G	G	G	G	G	G
65	DefaultIDCS Loop_12 Node_38	G	G	G	G	G	G	G	G	G	G	G
66	DefaultIDCS Loop_12 Node_4	G	G	G	G	G	G	G	G	G	G	G
67	DefaultIDCS Loop_12 Node_49	Y	G	N/A	G	N/A	G	G	N/A	G	G	G
68	DefaultIDCS Loop_12 Node_42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
69	DefaultIDCS Loop_12 Node_43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
70	DefaultIDCS Loop_12 Node_5	Y	G	G	G	G	G	G	G	G	G	G
71	DefaultIDCS Loop_12 Node_51	Y	G	G	G	G	G	G	G	G	G	G
72	DefaultIDCS Loop_12 Node_52	Y	G	G	G	G	G	G	G	G	G	G
73	DefaultIDCS Loop_12 Node_8	G	G	G	G	G	G	G	G	G	G	G
74	DefaultIDCS Loop_12 Node_7	Y	G	G	G	G	G	G	G	G	G	G
75	DefaultIDCS Loop_12 Node_8	G	G	G	G	G	G	G	G	G	G	G
76	DefaultIDCS Loop_12 Node_9	G	G	G	G	G	G	G	G	G	G	G
77	DefaultIDCS Loop_12 Node_50	Y	G	G	G	G	G	G	G	G	G	G
78	DefaultIDCS Loop_12 Node_91	Y	G	G	G	G	G	G	G	G	G	G
79	DefaultIDCS Loop_12 Node_92	Y	G	G	G	G	G	G	G	G	G	G
80	DefaultIDCS Loop_12 Node_93	Y	G	G	G	G	G	G	G	G	G	G
81	DefaultIDCS Loop_12 Node_95	Y	G	N/A	G	N/A	G	G	N/A	G	G	G
82	DefaultIDCS Loop_12 Node_96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
83	DefaultIDCS Loop_12 Node_97	G	G	G	R	Y	R	G	Y	G	G	G
84	DefaultIDCS Loop_12 Node_99	G	G	G	G	G	G	G	G	G	G	G

Legend

Checks Passed	Checks with Failure(s)
Checks Passed with Warning(s)	Not Applicable

requirements and recommendations. Deviations from the expected results are presented in the Harmony Benchmark Report which is immediately available on myABB. It presents a summary of the checks results in easy-to-read “traffic light” tables (green for good / yellow for ambiguous/red for incorrect). The findings are listed briefly and this gives a quick overview of the actual system status.

Performing a deep system analysis

The third step of analysis provides much more than a “Go/No-go” analysis. It is the creation of the Harmony Fingerprint, which is ordered from ABB Local Service. A service engineer performs a deep analysis and evaluation of the automatically generated Fingerprint Report. The resulting final report starts with an executive summary, pointing out the most important and urgent corrective actions, as necessary. Next it provides all the findings in summary and in detail. For each finding there is a technical description with impact and severity discussion, and proposals for actions to be carried out.

ABB Local Service presents the Fingerprint Report to the customer in a meeting. This gives the opportunity to discuss possible return on investment (ROI) impacts, and agreement, if necessary, on an action plan to improve system reliability, availability and operational performance.

What is being checked

Node performance:

Node performance statistics and node event and error counters are monitored to identify nodes with high message rates, indicate when messages are lost or unable to find designated targets, and help isolate the source of potential faults. Exception reporting statistics are also measured, indicating where parameters should be adjusted to optimize control system operations.

Module performance:

CPU utilization is measured to pinpoint module loading and configuration issues. Segment cycles are analyzed to determine if the system has enough CPU free time, if individual segments are getting enough CPU time and if the cycle times are behind the optimal count.

Module status:

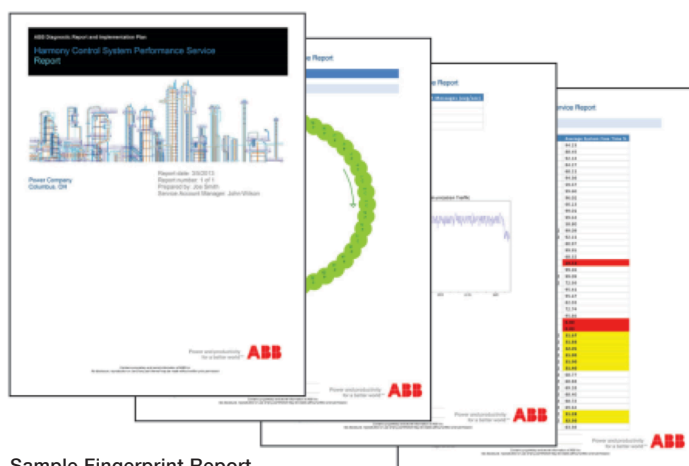
System thresholds, including error rates, controlway errors and memory overflow, are monitored to identify interrupted and/or discarded message rates, module-to-module communication error rates and errors between redundant modules.

Identifying improvement actions

The Harmony Fingerprint Report goes far beyond problem detection and reporting. It provides for each finding an individual

- technical explanation,
- severity evaluation,
- operational impact assessment,
- recommendation for actions, and
- documentation references, where applicable.

Standardized rules for report generation guarantee an easy to read report. On the one hand this is addressed to top level management. It presents the key findings in an executive summary, together with impact and ROI discussions; and recommendations for an action plan, if necessary. On the other hand it also provides a survey to the specialists, listing the identified problems and weak spots, and providing detailed technical advice.



Sample Fingerprint Report

Getting the benefits

- Detection of hidden degradation before problems occur, adopting a proactive maintenance strategy.
- Extend system life and take advantage of new technology.
- Establish baseline performance before system delivery or upgrade.
- Rapid response in case of troubleshooting and corrective actions.
- Reduce quality costs and downtime.
- Customer web portal for easy access to information and reports.

The Harmony Benchmark and Fingerprint establish a perfect initial step in achieving improved system performance levels. ABB continuously improves and expands Health Check Services, and as a result steadily improves the performance of its customer base.

For more details please contact your local ABB Service organization.

ABB Inc.
Power Generation
Wickliffe, Ohio, USA
Phone: +1 440 585 78 04
E-Mail: pspmarketing@us.abb.com

ABB AG
Power Generation
Mannheim, Germany
Phone: +49 621 381 33 33
E-Mail: powergeneration@de.abb.com

ABB Pte. Ltd.
Power Generation
Singapore
Phone: +65 62 22 77 78
E-Mail: powergeneration@sg.abb.com

ABB
Power Generation
Abu Dhabi, AE
Phone: +971 2 493 80 00
E-Mail: Sony.thampi@ae.abb.com

ABB Co.
Power Generation
Beijing, China
E-Mail: Bin.ye@cn.abb.com

ABB A/S
Power Generation
Skovlunde, Denmark
E-Mail: Martin.b.petersen@dk.abb.com

ABB Pty
Power Generation
Modderfontein, South Africa
E-Mail: Ben.momat@za.abb.com

ABB S.p.A.
Power Generation
Genoa, Italy
Phone: +39 010 607 3512
E-Mail: powergeneration@it.abb.com

www.abb.com/powergeneration

