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X Betriebsmitteilung Internal Message	☐ Besprechungsbericht Meeting Report	☐ Besuchsbericht Visit Report	☐ Telefonat Telcon	Ausstellungsdatum/Issue:
Name: Bertie Harte			Abteilung/Dept.: [redacted]	**Index Log:**
Firma, Ort/Company, Location: [redacted]				Datum/Date: 08/06/2016

Betreff, Teilnehmer/Reference, Participants:

Process Monitoring using Micro-Controller

1.0 Aim:

This document is intended to explain the use of a micro-controller device to monitor and display live cycle time information from production equipment,

2.0 Background:

Our current method of cycle time monitoring is to use a stopwatch and manual observation. This method is dependent on machine performance at the time of observation, and requires an observer to be physically present at the required location. Any data gathered would then need to be entered and saved if further analysis is required.
This Proposal utilises automatic recording and outputs this data to an SQL Database.
Once that data is in the Database it is processed into a live web-graph for display.
The Data is also stored for further analysis / reporting

3.0 Recommendation:

A Micro-controller device is a low-cost method of capturing cycle time data. The total cost for the Hardware was under €70
Such a device can be deployed to any machine where there is a signal voltage generated by a board detect sensor.
The basic Web GUI Graph is a good visual indicator of actual Line performance in Real-time.
The Database record is an even more valuable resource – post-processing of the data can highlight line performance trends.

4.0 Procedure & Equipment:

A Micro-controller device is connected to the +Vdc sensor output of the Conveyor Post ASM.
Each time a board is detected by the conveyor output sensor the device captures the event.
The device then resets an internal timer and measures the time to the next event. The elapsed time is counted as “Cycle Time” and transmitted via LAN to the SQL Database.
A simple SQL Query can then be run on the Database Table to output the result in a graphical form, the Web GUI is set to auto-Refresh every 60 Seconds, the query re-runs generating a “Live” snapshot of Line performance. (Fig.1)
A more complex set of SQL Queries can be subsequently run on the Database to output an expanded Report on Cycle Time Performance. (Fig. 2)

5.0 Appendix:

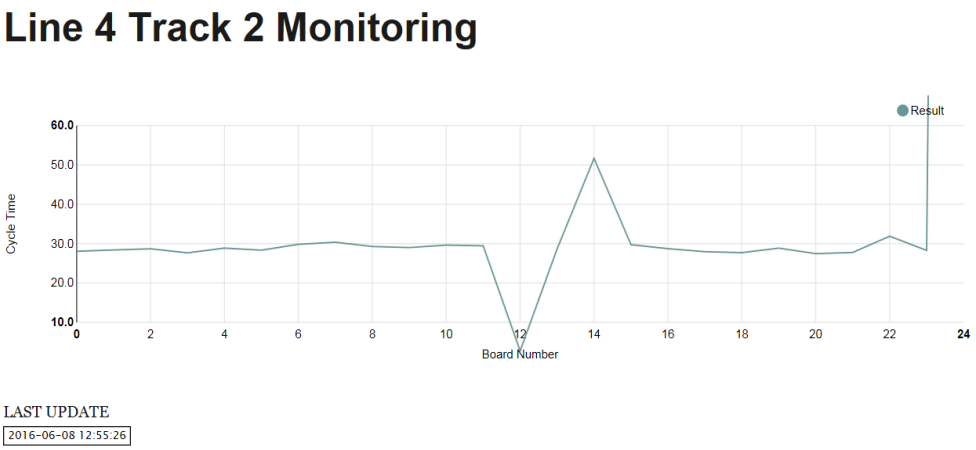

Fig. 1 Cycle Time Web GUI showing last 25 results and last update time.

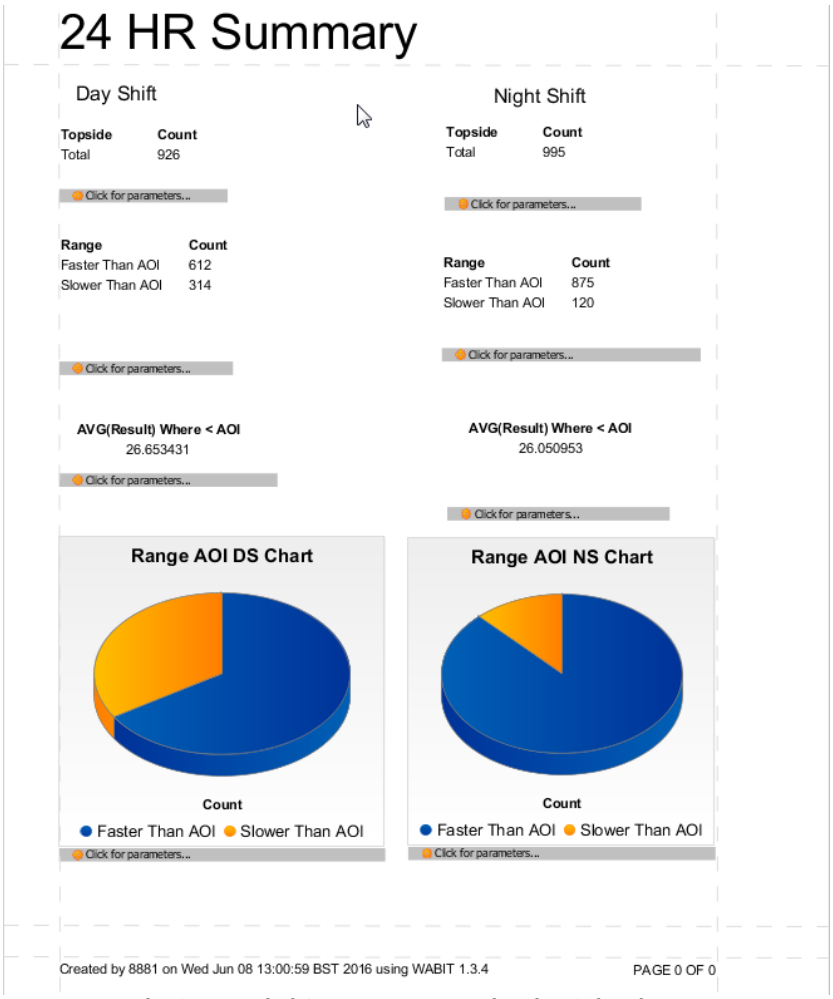

Fig. 2 Expanded Summary Report showing 24hr History