Factory Machinery Runtime and Operation Counter Monitoring Application

Monitoring production machinery runtime/downtime, operation counter with iTrixx-NHM Ethernet Hour Meter and Koda 100 I/O Controller

Background: An industrial printing company needed a method to count the amount of times a machine printed in a work day as well as recording the uptime/downtime of the machines to better increase their production efficiency.

Challenges: Their industrial printers cycle very fast so making sure the counts were registered accurately and consistently was top priority. Finding a method to relay each cycle was the greatest hurdle, as well as figuring out how to record the printer's runtime/downtime.

Device Purchased: Each machine uses one Koda 100 for pulse counter, one iTrixx-NHM Ethernet Hour Meter to record runtime/downtime.

Installation: The device is installed on inside area of the control cabinet and powered by equipment's control voltage (24V).

Solutions: To use the iTrixx-NHM Ethernet Hour Meter and the Koda 100 combinations provides the solutions for both issues. Registering each counter can be done using one of our digital inputs wired to a contact or hall effect sensor that records each cycle or pulse and tying it to a counter using our webpages. You can see how this is accomplished here:

Counter Configure – Koda 100

There are two digital inputs on the Koda 100 that can read a 5-24VDC "on" signal from the sensor, at each time this is recorded it adds to the counter.

To activate the counter, go to Services – In/Out page, click the "Edit" icon on the input that the sensor is connected to, the **Set Digital Input** page is displayed. You can give this counter a name in the **Name** box, check the Use box to activate this input, and select **Counter-R** for resettable counter from the dropdown lists in the **Type** box. Select your preferred display type from the Display box, then enter **N** (Input Normal mode) in the Command field and click **SAVE**. For troubleshooting you may wish to set Display to Values. Upon returning to the In/Out page, the DIN1 value should read 0.

Runtime/Downtime Configure – iTrixx-NHM

There are two meter counters on the software for each iTrixx-NHM device, we use one for runtime, and one for downtime. To trigger the meter, we wire both inputs to a circuit on the printer that outputs a 5-24DC voltage when the printer is running, use the digital input 1 to trigger Meter 1 for runtime, digital input 2 to trigger Meter 2 for downtime. Depending on whether the state of this circuit is "On", the runtime meter is counting, when the circuit is "Off", Meter 2 is counting.

Activate the Meter

To activate the counter, go to Services – Hours page, check the **Use Meter 1** box**,** select **Input 1** from the **Trigger** dropdown list, you can also give this meter a name at the **Meter 1 Name** box if you like. Doing the same for Meter 2, the only difference is select **Input 2** on the Trigger box, then click **UPDATE**.

LINORTEK

PAUSE

Hour Meters

Use [nn] for settings in seconds, (nn) for settings in hours.

Enter the settings in the fields below:

Use Meter 1 :	☑		Use Meter 2 :	☑
Trigger :	Input 1 ▾		Trigger :	Input 2 ▾
Meter 1 Name :	Uptime		Meter 2 Name :	Downtime
Seconds/Tick :	2		Seconds/Tick :	2
Used endurance :	▬▬▬▬▬▬		Used endurance :	▬▬▬▬▬▬
Voltage Threshold :	0		Voltage Threshold :	0
Send Email :	☐		Send Email :	☐
Email Count :	0.00 HRs [0]		Email Count :	0.00 HRs [0]
Relay Control :	⦿ On ◯ Off 0		Relay Control :	⦿ On ◯ Off 0
Relay Count :	0.00 HRs [0]		Relay Count :	0.00 HRs [0]
Preset :	0		Preset :	0
Push Report Interval :	0		Push Report Interval :	0

UPDATE   **CANCEL**

Configure the Digital Inputs to Trigger the Meter

Since both digital inputs are connected to the same power source on the printer, we will need to set different mode for input 1 and input 2.

Go to **Services – In/Out** page, click the edit icon on **DIN1,** check the **USE** box, select **State** from the **Type** dropdown lists, on the **Command L/Z/N/I** box**,** enter command "**I"** to make this input as invert input. Other settings are optional, then click **SAVE**.

Doing the same for DIN2, on the **Command L/Z/N/I,** enter command "**N'** to make this input work as normal input.

The meter is now set up and ready to record runtime/downtime. When digital input 1 is "On" it starts counting the "Runtime" of the printer set to Meter 1 and turns off the downtime counting set to Meter 2, likewise when digital input 1 is "Off" it turns off Meter 1 and turns on Meter 2.

To collect the data you can download our HourCollector software for free off our website (https://www.linortek.com/downloads/support-programming/) which will create a spreadsheet that will collect the HourMeter run times. However in this particular case the customer needed to record the counts of each print cycle, so he followed our instructions to export the relevant .xml data directly to a spreadsheet (https://www.linortek.com/importing-data-from-hour-meter-to-spreadsheet/). This allowed him to also integrate his personal spreadsheet with his companies own proprietary software.

Results: The customer has enjoyed our iTrixx-NHM and the Koda 100 controller to collect his equipment runtime and the cycles they go through each day. He collects and stores his data directly to a .xml spreadsheet which keeps a running log. He furthered customized his software to send himself alerts for maintenance intervals, making sure each printer is running smoothly.