DFM-ALPHA™
WITH INTELLIGENT CLOSED LOOP CONTROL

Coil coating is fast, typically running between 50 and up to 200 metres per minute. This means that any coating mis-measurements can be expensive. Imagine the savings, if the coater were at optimal settings 100% of the time.

Welcome to DJH Designs DFM-Alpha ... harnessing science, delivering perfection.

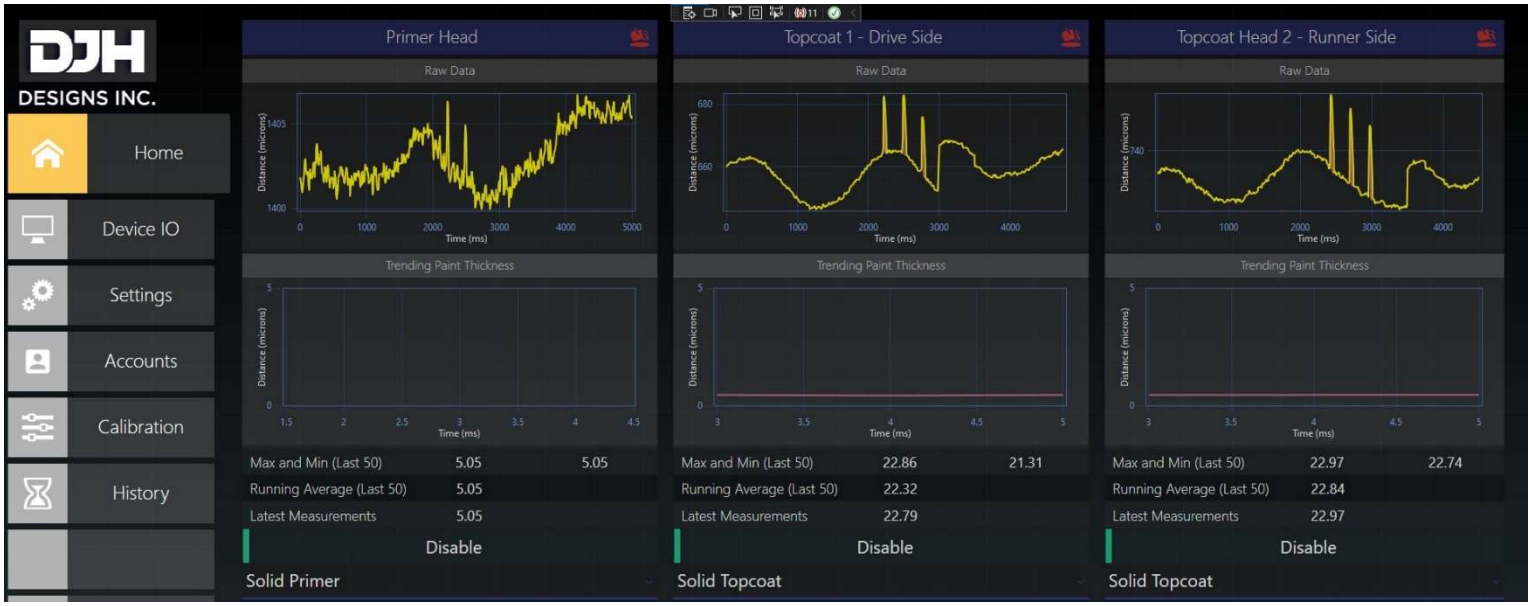
DFM-ALPHA™ - the world's first online paint thickness instrument featuring integrated closed-loop control (CLC™). ALPHA™ adjusts the coater, keeping the product on specification. CLC™ continually monitors the coating thickness, and at the first sign of drift, the roll coater is adjusted. Coater adjustment is quick, precise, and the product stays on target. Coater roll speed, metering roll speed, line speed, and measured DFT are continually streamed to the advanced DFM-ALPHA algorithms. Paint properties within the coater related to viscosity, volume solids, and coater roll leakage are derived in real time and used to adjust the coater precisely. Only DFM-Alpha provides this leading-edge capability. DFM-Alpha monitors coating thickness 24/7 and fine-tunes the coater in the event of even the smallest drift. It impressively does this without the need for expensive or complex coater head modifications. This ability comes from Alpha's unique artificial intelligence. Your product will never be out of specification again. Set up the coater, start painting, dial up the target, and let DFM-Alpha do the rest. DFM-Alpha quickly and continuously optimizes your coatings. CLC™ does this while safeguarding the quality of your paint finish. The coater roll is kept within strict parameters to maintain the high-quality appearance and smoothness of the paint finish.

DFM Alpha and DFM-Ultra™ Performance Features

- Measurement accuracy is better than +/- 0.2 micrometres
- Measurements are independent of paint type, substrate type, colour, paint thickness – no calibration is needed to cover this broad product range.
- DFM accurately measures textured and wrinkle coatings and can characterize the peak-to-valley depth and spacing of these finishes.
- DFM measures coatings from 3µm to above 100µm.
- 2 units are typically installed on the top finish to measure both sides of the strip, while most prime installations only require a single centrally-mounted unit.
- All units, with the exception of the fixed-in-place centrally mounted units, have active edge detection that will locate the edges of the strip to position the units correctly to accommodate for changes in strip widths.
- All units have Z height control and will retract to a safe distance to clear the strip splice.
- DFM-Alpha and DFM-Ultra are installed above a strip turn roll after the paint curing.
- DFM-Alpha and DFM-Ultra are designed with extremely low maintenance requirements. Typical life will be up to 20 years.

DFM Operation

At the start of every new coil the INTENSE MEASURE feature takes up to 40 precision measurements in the first 2 metres of painted product. Then, DFM measures at user-definable pre-programmed intervals, typically every 20 to 90 seconds. DFM communicates with the line PLC, so it knows when the painting starts and when it stops. In AUTO mode, DFM starts and stops measuring without operator involvement. Operation is simple - the only operator input needed is the TARGET THICKNESS.



The DFM software runs on a robust industrial computer and is licensed to the end user.
An annual software maintenance plan provides security and support and ensures that the PC is up to date with the latest upgrades. Internet Access for the PC is required.
One or more remote monitors are supported via a VGA or HDMI interface.

Production Report Features

DFM software produces detailed PRODUCTION REPORTS and COIL REPORTS. All results are stored in an archival database that can be exported at the simple press of a button.

- The report can be customized for any time period, whether a shift, a day, a week, or a month,
- The report can be automatically sent by the system to an email address. For example, the production manager can set it up to receive a daily email at a regular time,
- The report includes the stop and start time, line speed, painted strip length, and details of coating thickness for each coil during the period,
- The report includes the percentage of time that the line was painting, and the total painted length (metres or feet) for the report duration.

Coil Report Features

Coil reports can be generated by going into the production database and selecting the required coil numbers.

- The report includes the coil start and stop time, the length painted, and the line speed,
- A graph shows paint thickness, including the upper and lower control limits, and
- The coil report requires coil numbers at the DFM™ computer for each coil during production.

Principle of Operation

DFM-Alpha and DFM-Ultra are the most advanced, easy-to-use, and accurate online systems in the world.

DFM™ technology uses patented direct measurement technology (DMT). DMT™ is the most scientifically sound principle for accuracy in film thickness measurement. A major benefit is that it is calibration-free regardless of the paint or substrate type. A laser is used to ablate an extremely tiny 170-micrometre-wide measurement point to the surface of the metallic substrate. A high-precision laser sensor measures the depth at the spot, and this equates precisely to coating thickness. The spots are almost impossible to find and do not affect product performance; this has been verified independently by an independent coating manufacturer's lab. Coil-coating paint systems are designed to perform well with end-product features, including bends, cut edges, laps, scratches, and fasteners. DFM measurement of the product provides a guarantee of quality and assurance that the coatings will perform to specification and meet paint thickness standards.

DFM Alpha and Ultra Specifications (Typical)

Basic Operation:

Requires Line speed and Avoidance Signaling

Remote Control Operation:

Requires Settings, Algorithms, and Requested Commands

Provides Thickness and Machine Monitoring Information

Alpha Coating:

Requires Coater Head Speeds and Limits

Provides Suggested Adjustments and Changes to Coater Head

General Specifications:

Dimensions (L x W x H): 1600mm x 960mm x 550mm

Weight: 240 Kgs

Power Supply: 120-240VAC 50/60Hz

Current: 15A

Coating Thickness Measurement Range: 3 to 100+ µm

Digital I/O

TCP/UDP

Support most industrial Fieldbus protocols.

Support back-and-forth communications with plant equipment and/or PLCs in several tiers and degrees.

Standard configurable two-way Gateway device to control the output/input to the customer's desired needs.

Warranty: 1 year for all parts and labor.

Specifications are subject to change;

DFM Alpha and DFM Ultra are protected by granted and pending patents. IP is protected in the USA, China, Europe, Canada, India, Australia, Japan, South Korea, Canada, New Zealand, Asia, and the Middle East. E.g., granted US patent 9,366,528.

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DJH DESIGNS INC