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Introducing the Online Machine Shop.

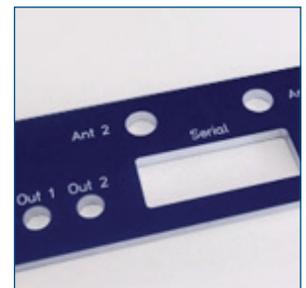
This case study describes how Front Panel Express has leveraged the flexibility of DATRON high-speed machining technology and combined it with their own design software to empower their customers with a unique do-it-yourself service. Specifically, this 4-step business model allows online customers to download software, design a front panel, order and wait for delivery of the finished product in quantities from single units to production runs.

FRONT PANEL EXPRESS HISTORY.

Front Panel Express LLC was established in Seattle, Washington in 2002 by German sister company, Schaeffer AG owners Kai and Jörg Schaeffer, and partner Christian Blöss. The company manufactures custom front panels that are designed by customers, using their free software, Front Panel Designer. Custom front panels were previously made by hand using drills and files, until 1988 when Schaeffer purchased their first DATRON high-speed machining center. With the realization that many engineers designing other electronic products faced a similar challenge sourcing small runs of custom front panels, the idea for Front Panel Designer was born. Schaeffer developed a CAD / CAM system adapted to the production of front panels, which allowed customer designs to be quickly and efficiently transferred to a CNC machine. The emergence of the internet made this technology readily available to customers, many of which were coming from the US. Thus, Front Panel Express opened its doors with a single DATRON machining center in 2002. This convenient and unique business model met a high demand from R&D engineers, small companies and hobbyists. This demand was so great, that soon business called for another DATRON machine and a larger production facility. Always striving to provide robust capabilities for customization, as the company grew, so did their offering. A wide range of colored aluminum and plastics were made available, as well as engraving styles and a variety of colored infilling and powder-coating options. In 2007, Front Panel Express moved to their current location, an 8,300 square foot manufacturing facility with an additional 4,000 square feet of office space. They will soon be adding an additional 6,000 square feet of manufacturing space and have recently added their 6th DATRON high speed machining center in order to keep up with the ever growing demand. They now serve North America and Australia. With a 4 year head start, Berlin-based Schaeffer AG has 10 DATRON machines and serves all of Europe.

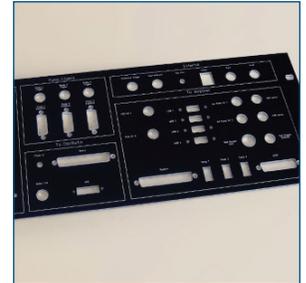
A 4-STEP PROCESS, EMPOWERING THE CUSTOMER WITH CUSTOMIZATION.

Download. Design. Order. Receive. From the customer's perspective it's as easy as that. But, behind the scenes there's a little more to it — you may call it "silent customer service" that's invisible to the customer but guarantees the quality of the product they receive. With very few orders requiring a customer phone call, Front Panel Express reviews every file generated by online customers before the machining begins and will correct errors to prevent design flaws or when areas for improvement or increased machining efficiency are noticed.



HERE'S HOW IT WORKS:

The Front Panel Designer Software is a front-end interface that allows non-machinists to easily make a custom product by selecting from a variety of materials ranging in thickness and color, placing holes, slots and engraving and even picking from a wide range of infill colors and powder-coating options. What the users see on the screen is what they will get in the finished product and once they're done designing they automatically get a price calculation so they can adjust the design to meet budget requirements. While this simplicity attracts a lot of hobbyists, the software is also robust enough to allow larger customers, such as Lockheed and Boeing, to take drawings prepared for other panel manufacturers and convert them.



Much of this process is enabled by the DATRON machine's DLL software interface which allows for importing of external data sources. On the back end, some elements are DATRON code and some are Front Panel Express Code. For example, the font library and cut outs are DATRON and the DXF imports are Front Panel Express. But, it is the DATRON DLL that allows for them to work in concert and for the conversion of all of the data to a final milling code. In the case of DXF imports, if there are any broken lines or open spaces after the conversion, the software alerts the user with a red flashing arrow pointing to the problem area. The software limits tool sizes (up to 3mm) and the number of material thicknesses (up to 10mm) to keep things within the parameters of the DATRON machining center and to minimize the amount of stock that needs to be maintained — thereby lowering overhead and containing costs. The savings is passed on to the customer.



The end result, is a process that converts overviews, prints a milling tag, sets quantity, color and position for batch machining in the case of a multiple panel order — and even prioritizes jobs by delivery date. All the operator has to do is place the correct blank in the chuck and enter an order number. Then the DATRON machine loads the milling file or macro file, automatically finds a zero point, probes the blank and begins machining. The Z Probe on the DATRON machine scans the surface of the blank and lets the operator know that it's the right one for the job, which minimizes waste. It also ensures accuracy and the quality of the finished part, which is critical to its functionality and customer satisfaction.



According to Front Panel Express Production Manager, Scott Hoveland, "The plug and play flexibility of the DATRON machine is one benefit and the industrial reliability is another." He adds, "With 6 DATRON machines on our floor, 2010 was the first time we had a service technician come to visit since 2002 and that's just amazing."

Hoveland, having managed other machine shops prior to his tenure at Front Panel Express, is particularly impressed with the DATRON track record of dependability since it contrasts so much from his experience with large VMCs. "When those larger machines went down, we'd have to wait until the service technician came out before we could even find out what was wrong, and then have to wait for parts to be ordered and for the technician to come back out and fix it." The DATRON machines, on the other hand allow for remote diagnostics and 90% of the time problems can be solved over the phone within an hour — in many cases without any exchange of parts. By leveraging the power of their Microsoft® Windows®-based controller, with a push of a button DATRON machines perform auto diagnostics and produce emailable Anomaly Reports that show machine status and recall any errors that may have led to the issue. This helps them to swiftly diagnose the problem and, if necessary, get a spare part out the door and delivered to the customer on the next



business day. Then, by use of phone or email, their skilled technicians walk the operator through part replacement. In some cases, they direct operators to their online customer Extranet to view diagrams or photos that aid them during instruction. Once the part is replaced, the operator simply reboots, the machine performs an automatic re-calibration and the customer's production resumes.

The smaller size and footprint of the DATRON machines allows Front Panel Express to fit many of them on their shop floor to maximize throughput and keep up with incoming orders. But, they also require a large machining area to accommodate multiple part setups and large sheet material for batch machining of multiple part orders. Fortunately, the DATRON machines deliver that as well. In fact, their most recent machine addition was a DATRON ML that provides a 60" x 45" machining area while only requiring 93" x 73" x 77" (W x D x H) of floor space.

DATRON Dynamics Vice President, Robert Murphy says, "Through R&D and ingenuity, Front Panel Express has leveraged the unique features of Datron and taken it one step further to create a highly efficient manufacturing process." This is a huge success story for both for them and us". One of the unique features that Murphy is referring to is the VacuMate™ (vacuum table) which is designed to swiftly and efficiently secure flat workpieces to the bed of a machining system. Thin stock, which could be secured only with great difficulties before, is now secured in seconds. This includes plastic foils as thin as 0.001", to 0.250" large aluminum sheets. The VacuMate features airflow-optimized ports, with recessed chambers, to provide superior vacuum distribution. A low cost, gas-permeable substrate serves as a sacrificial vacuum diffuser, allowing the cutter to machine through the workpiece, without cutting into the table. Plus, since the coolant used for aluminum is a fine mist of ethanol which provides a better cut and quickly evaporates, parts come off the machine clean with no need for secondary operations like degreasing or deburring.

Front Panel Express CEO, Diane Haensel, explains that while the relationship between her company and the end customer can be seamless since the transfer of information often occurs online, the relationship between Front Panel Express and their vendor, DATRON, can be more hands on. She says, "If I have a question, I know that with a single call I can speak to their president." Haensel continues, "Plus, DATRON offers ongoing instruction like DATRON University that I've personally attended and that kind of training allows us to offer a superior service to our customers." The booming business that Front Panel Express has maintained through an economic downtrend and the amazing growth that they've had in less than a decade certainly supports this claim.

Text Captions for Supporting Photos on the following pages:

Photo 1: The Front Panel Designer Software interface showing simple panel designed in 5 minutes.

Photo 2: Finished panel based on the design created in Front Panel Designer.

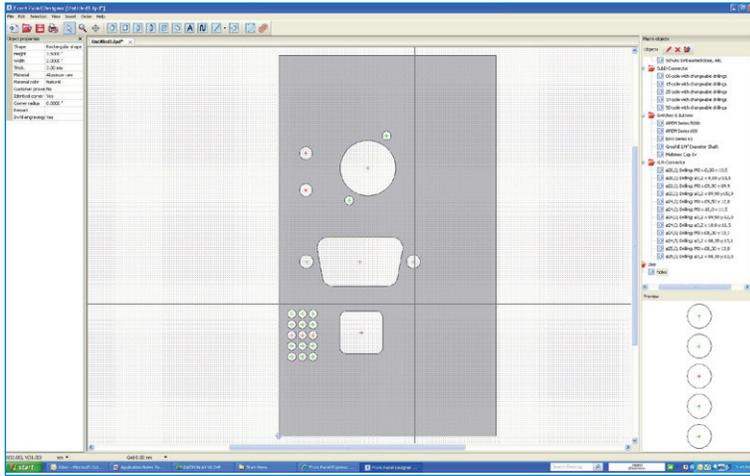
Photo 3: Clayton Olander, machine operator, selects the appropriate stock and sets the blank.

Photo 4: The blank is secured with a pneumatic clamping device.

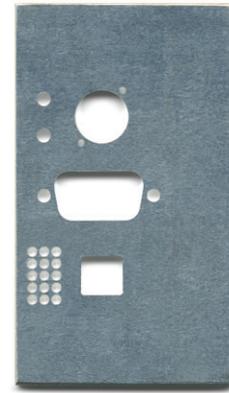
Photo 5: The machine operator loads the customer-created program and the machining begins.

Photo 6: Panels can be run unattended due to automated features such as probing and automatic tool changers – allowing the operator to attend to other machines.





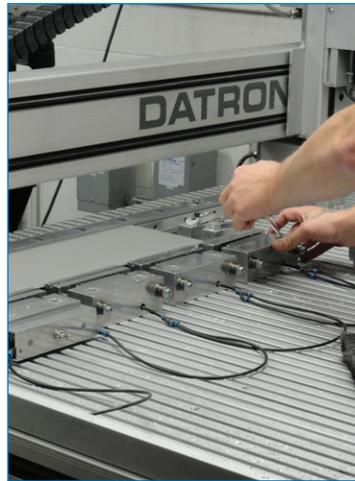
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