

A3 LED Color MFP: New MC8 series

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The A3 LED color MFP MC883/MC863 series is the first wave of products supporting OKI's new "COREFIDO3"^{*1)} ^{*2)} MFP/printer service. "COREFIDO3" is an evolution from the previous "COREFIDO2" service, which included a 5-year warranty and 5-year free maintenance, and significantly reduces MFP/printer downtime. The newly developed MC883/MC863 series is introduced below.



Photo 1. A3 LED Color MFP MC883dnwv

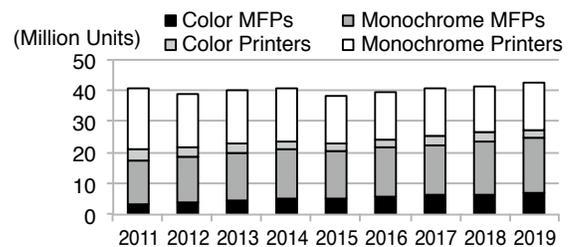
Target Market and Product Concepts

(1) Market Trend

As shown in **Figure 1**, while the worldwide shipments of print-only printers are decreasing, shipments of MFPs capable of printing, copying, scanning and faxing are increasing. Among them, the color MFPs are expected to show high growth in the future. Observing the sales of MFPs by handling of color and paper size, over 50% are A3 color MFPs, and large copier-based MFPs have accounted for a great portion of these.

It was common practice for offices to place a large and highly functional MFP in a central location. However, due to the changing office environment that includes the use of mobile/cloud and user demand for cost reduction, trend is shifting toward distributed placement of multiple small to medium-size MFPs/printers depending on frequency of use in each department. Large copier-based MFPs normally require periodic servicing performed by a maintenance technician. On the other hand, OKI

Data's printer-based small to medium-size MFPs have simple construction utilizing a LED head. Therefore, periodic servicing requiring a maintenance technician is not necessary and leads to reduced maintenance cost.



Source: IDC, Worldwide Quarterly Hardcopy Peripherals Tracker 2015Q2

Figure 1. Worldwide Laser MFP/Printer Shipments^{*3)}

(2) Product Concepts

The MC883/MC863 series was developed based on the three concepts of "reduce cost and downtime for maintenance," "non-wasteful functional performance" and "support of various solutions."

In order to "reduce cost and downtime for maintenance," maintenance barrier-free design^{*4)} and cloud maintenance platform were adopted enabling users to replace consumables and perform troubleshooting on their own. With the maintenance barrier-free design, the operation panel's guidance was revised as to be the view from the user to allow easy replacement of consumables and handling of problems without requiring expert knowledge. The cloud maintenance platform utilizes cloud guidance to offer troubleshooting guidance from a dedicated support site in the cloud as well as remote maintenance for allowing support centers to remotely access the MFP, determine the problem, and change configuration as needed.

"Non-wasteful functional performance" offers 35ppm printing and copying, 50ppm high-speed scanning with a newly developed A3-size scanner, maximum of four paper trays, and a compact footprint.

For "support of various solutions," OKI developed its own Open-API enabling the MFPs to use software

*1) "COREFIDO" is a registered trademark of Oki Data Corporation. consisted of the actual 2011-2014 results and 2015-2019 forecast.

*2) "COREFIDO3" is sold only in Japan.

*3) Figure 1. "Worldwide Laser MFP/Printer Shipments" is

*4) "Maintenance barrier-free design" is a trademark of Oki Data Corporation.

offered by third party vendors. Additionally, the function to integrate with OKI's CrosCore^{®5)} business phone was developed so that the status of the MFP such as fax reception, printing and expended consumables can be displayed on the multi-function phone.

The specifications of the MC883/MC863 series are outlined in **Table 1**.

Table 1. MC883/MC863 Specifications

Model	MC863dnw	MC863dnvw	MC883dnw	MC883dnvw
Print/Copy Speed	35ppm (A4, single-side)			
Scan Speed	50ppm (A4, single-side)			
Print Resolution	600dpi		1200dpi	
FCOT	10 seconds			
Paper Capacity (64g/m ²)	Standard 430 sheets Maximum 2,170 sheets	Standard 2,170 sheets Maximum 2,170 sheets	Standard 430 sheets Maximum 2,170 sheets	Standard 2,170 sheets Maximum 2,170 sheets
Paper Output Tray	1		2	
Operation Panel	7-inch color touch panel			
Dimensions (WxDxH)	563x600 x700mm	563x600 x1216mm	563x600 x700mm	563x600 x1216mm
Weight	Approx. 62kg	Approx. 94kg	Approx. 64kg	Approx. 96kg

Key Technologies for Realization of Product Concepts

The newly installed features of key technologies to realize the product concepts are described below.

(1) New A3 Scanner Unit

The ADF (Automatic Document Feeder) of the newly developed A3-size scanner unit utilizes two motors to separately drive the paper feed and transport systems resulting in a high-speed, high quality, 50ppm scanning of both color and monochrome documents. Additionally, the increased transport power is capable of handling both single-side and double-side transport of documents up to a thickness of 120gsm.

Furthermore, equipped with new automatic document size detection and double-feed detection functions, as A3-size scanner, a wide variety of document scanning capabilities are realized.

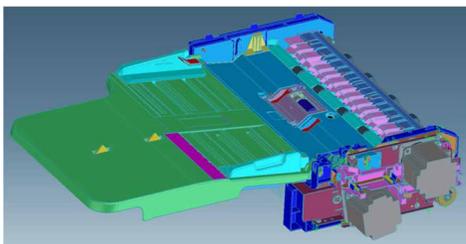


Figure 2. ADF Mechanism

⁵⁾ "CrosCore" is a registered trademark of Oki Electric Industry Co., Ltd.

(2) Double-feed Detection Sensor

The use of an ultrasonic double-feed detection sensor at the tail end of the ADF feed roller made it possible to detect double-feed of documents accurately immediately after the ADF feeding, thereby improving the reliability of the scanning operation.

(3) Double Output Trays

A second output tray was arranged between the scanner and printer units to separate the output destination of the fax and regular printing. This upper output tray for the fax is equipped with a large LED indicator to notify the presence of received fax. These features prevent incoming faxes from mixing with and getting lost in printing output while improving user convenience.



Figure 3. Double Output Trays

(4) Optional Tray with Dehumidification Heater

Models for Japan's domestic market offer an optional tray standardly equipped with a dehumidification heater for effective prevention of paper curls in a high humidity environment.

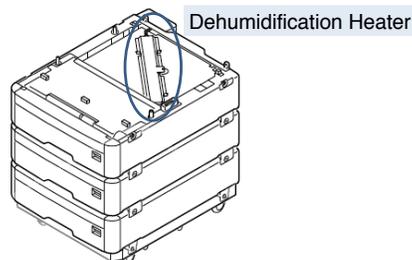


Figure 4. Optional Tray with Dehumidification Heater

(5) Next Generation Operation Panel Guidance

A navigator utilizing a 7-inch touch panel was developed to support the maintenance barrier-free design.

First, to make troubleshooting process easier to understand, pictures and animations from the user viewpoint were extensively used. Usability studies were conducted several times employing outside testers with experience using MFPs to determine operations that were confusing and obtain user opinions. The findings were fed back to the panel design.

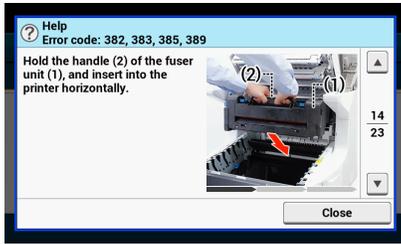


Figure 5. Operation Panel Guidance

Next, the operation panel was equipped with an auto-tilt mechanism. The operation panel is fitted to the scanner unit, which is opened at the time of maintenance. Therefore, the operation panel was made to tilt automatically so that the panel remains visible to the user while maintenance is performed.



Figure 6. Auto-tilt Mechanism

Additionally, alphabetical notations such as A, B and C were placed at positions often used by users. This allowed the users to see the place to operate intuitively with no expertise.

Finally, the approximate time required to remove a paper jam or handle other maintenances are displayed. This is especially helpful in lowering the psychological hurdle for first-time users who might worry as to how long it will take to handle certain maintenance.

The incorporation of the features above has resulted in guidance with excellent operability and visibility, thereby improving user experience.

(6) Cloud Maintenance Platform*⁶⁾

Cloud maintenance platform is composed of “cloud guidance” and “remote maintenance.”

●Cloud Guidance

When MFP error occurs, MFP status is checked at the cloud side and the best solution is displayed on the dedicated Web or app. Previously, if a problem could not be resolved through the operation panel or user manual, the support center was contacted. With cloud guidance, the user can resolve problems on their own even outside

the support center’s business hours such as at night or on weekends, thus reducing downtime.

The dedicated Cloud Support app was developed to allow mobile devices access to cloud guidance. The app can be downloaded free for both Android and iOS devices from Google Play Store and App Store, respectively. For Windows computers, there is a function to create a desktop shortcut to cloud guidance during the setup process at the time of MFP installation. As a result, the user can access cloud guidance without hesitation when a problem occurs.

Furthermore, by associating a mobile device with the cloud-connected MFP, solution to the problem occurring on the MFP can be displayed on the mobile device.

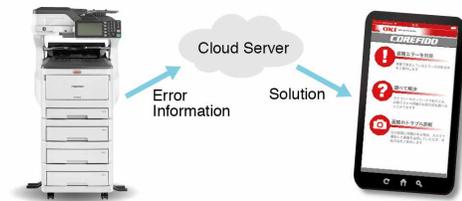


Figure 7. Image of Cloud Guidance

“Frequently Asked Questions (FAQ)” has been prepared for user not authorized MFP’s cloud connection. The FAQ can be accessed via the Cloud Support app or a normal Web browser. Solutions can be searched using free text search or from a list of topics.

By analyzing the accesses at the cloud system side, MFP improvements and FAQ enhancements can be made to provide products/services that will better meet the needs of customers.

●Remote Maintenance

A two-step solution to solve problems related to print quality (PQ) has been prepared.

The first step displays examples of typical PQ problems on the operation panel, and the user interactively solves the problem supported by the “operation panel guidance” mentioned previously. The operation panel displays the section that needs cleaning and the procedure for cleaning, which the user performs. Next, a single-page test chart is automatically printed for checking the overall PQ. The user views the test chart and determines if the cleaning has solved the PQ problem. If the problem was not resolved with this procedure, the operation panel guides the user to the second step.

The second step involves diagnosis via phone support and corresponds to “remote maintenance.” In the past, phone support of PQ problems cost time and money

*6) “Cloud maintenance platform” is a trademark of Oki Data Corporation. Other product names and company names are generally the property of their respective registered trademarks or trademarks.

in determining the content and extent of the problem indicated by the user. When the problem is verbally described over the phone, the description often varies from user to user due to the user's subjectivity and insight. Not only does it consume time to understand the PQ problem the user is trying to convey, if information provided is insufficient, a maintenance technician will need to be dispatched and determine the problem from viewing the actual test chart. Dispatching a maintenance technician means additional time for resolution and creates MFP downtime for the user.

Therefore, a PQ depository feature was added to assist the second step phone support. Before proceeding with the phone support, the operation panel displays instructions for the user to set the test chart from the unresolved PQ problem on the scanner and perform necessary procedures. Through this procedure, the image of the test chart is sent and stored in the cloud server. Then the user calls the support center and provides the code displayed on operation panel. The support staff enters the code into the later described maintenance portal to retrieve a high-definition image of the test chart deposited to the cloud server.

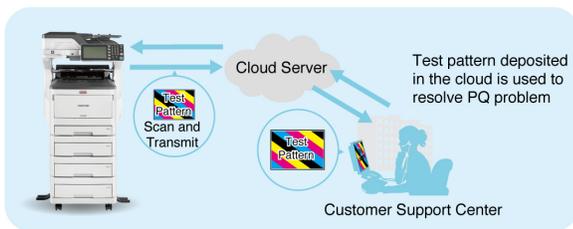


Figure 8. PQ Depository Feature

Another feature made available to assist the support center is the maintenance portal.

The introduced MFPs have a feature to send information such as the problem situation, status of consumables, MFP configuration and error logs to the cloud server. When the user calls the support center, the support staff requests the code displayed on the operation panel. Entering the code into the maintenance portal, the support staff is able to browse the MFP's information stored in the cloud server. This allows the support staff to view the status of the MFP while listening to the user's inquiry. With this feature, it is possible to grasp the essence of the problem that the user is facing accurately and in a shorter period. In case of PQ problems, the deposited detail image from the PQ depository feature in step two of the PQ self-test described above can be viewed in conjunction.

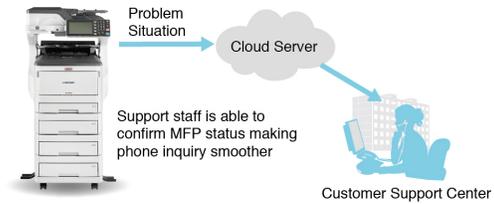


Figure 9. Maintenance Portal

In the past, the problem was only speculated from verbal information. However, using the maintenance portal, the situation can be grasped as though a maintenance technician is actually onsite at the user's location and viewing the status of the MFP. With this feature, the problem can be assessed during the phone inquiry to determine whether it can be resolved by the user or if a technician needs to be sent to replace components. Additionally, if the problem can be resolved with configuration changes, a remote configuration feature is available. This feature allows the support center to configure the MFP accurately without requesting the user to make complicated changes.

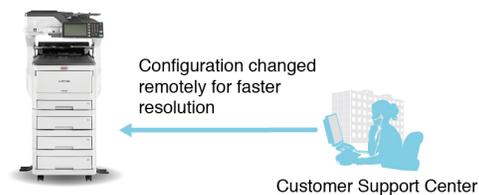


Figure 10. Remote Configuration

Conclusion

The new MC8 series, utilizing a LED print engine and OKI's own A3 color scanner, was developed as a customer friendly product aimed at thoroughly eliminating the three wastes of cost, stress and time. The idea of having the customers resolving their own problems may provide the acquisition of new needs. Future lineups will be increased as an evolution of OKI Data's COREFIDO and product development will continue from the customers view. ◆◆

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