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1.0 Market Background

1.1 Product Overview

The UMC/M3 charger combines the benefits of the UMC charger and M3 modem into one device with an end-user interface that is more suitable to Mobile Computing applications in Healthcare. The product is being developed exclusively for Rubbermaid Medical Solutions.

1.2 Key Applications

Healthcare: BMVA, Pharmacy, Admission

1.3 User Profiles

End-users: Must integrate well into nursing workflow on point of care computing carts
Business Case – Projected ASP and Volume

Year 1 (2011)
Units: 2500

Year 2 (2012)
Units: 3500

Year 3 (2013)
Units: 2000

1.4 Winning Attributes

Smart integration of Palm Form factor onto mobile computing cart to improve nursing workflow.

Key differentiators include:

- Easy docking and retrieval.
- Position and mounting are conducive to cart based hands-free scanning.
- Paging feature for locating and low battery alert
- Integrated modem for cleaner appearance and improve usability
- USB power to simplify integration

1.5 Business Case – Projected ASP and Volume

3000 – 5000 units in first 12 months

2.0 Product Requirements

2.1 Industrial Design

Design will be more compatible with the RMS design language but still complement the existing CR2500 color scheme and form factor. The design should be inviting to the user and appear sleek and integrated into existing RMS products. Overall depth/thickness of dock plus scanner should be minimized. The user should be able to easily orient/dock the scanner into the charger without difficulty. A positive indication of engagement (click, tone, or light) should provide feedback to the user that the scanner has been docked successfully.

The UMC/M3 will contain a new PCB that incorporates the functionality of the UMC and M3. The device will only work with the Palm Style CR2500 scanner.

Disinfectant ready material. Anti-microbial coating/material.

Colors: If possible utilize light gray from current RMS color pallet. Consideration for other RMS colors is currently being evaluated.

The UMC/M3 will have brand markings for both Rubbermaid & Code. The Rubbermaid brand will be prominent on UMC/M3 combo and complemented by existing branding on the CR2500 scanner. Code logo would be covered by the scanner when the scanner is mounted.

2.2 Indicators

LED charging and paging indicators should be visible to user from both right and left mounting positions. Charging base should not obstruct LED indicators for Good Reads and Scanning Active Modes

Blue LED on Charger to indicate connection as in the M3 Mode.

2.3 Optical

While scanner is in base, the optical field should not be reduced.

2.4 Mechanical

Scanner should be securely held in base while cart is in motion and moved over a 1" floor threshold. A connection between the contact points on the charger and scanner should be maintained.

The force required to dock and undock scanner should be comfortable for a nurse (profile: Female; Age 47). Position of scanner while docked should allow for reading of larger objects such as IV bags and bulk liquids.

A provision for cable management needs to be incorporated to ensure the USB cable does not disconnect when the monitor is rotated or the cable is agitated. This solution may be incorporated onto the mounting bracket

The UMC/M3 mounts to a bracket using a "keyhole" design – see renderings in Exhibit 3.1 . Bracket design and spacing to be determined by Rubbermaid. Fasteners should be inset so as to not interfere with scanner.

Wear and tear to the scanner should be minimized from docking and undocking

The primary material will be plastic and will be chose to meet durability and clean ability requirements and limit wear on the scanner.

Button will be located on charger to page scanner should it become missing.

2.5 Electrical

The electrical design of the ECS-RMS/RMD will integrate the power control circuitry of the standard UMC charging base with the M3 CodeXML modem onto one PCBA, as well as including a switch for a paging function.

Power will be supplied by a detachable cable, which will interface to the charger via an affinity type RJ50 to USB cable. We will assume that it occupies an entire 500mA current allowance from the upstream host port.

There is a bi-color LED to indicate whether or not a code reader is inserted and whether or not it is charging. In order for these indicators to display properly, we use a ground sense circuit feeding comparators that in turn operate the LEDs. In our ground sense circuit, we use a 500mΩ sense resistor that will have less than a 60mV drop across it when the battery is fully charged. A second blue LED is required to indicate connection as in the M3 Modem.

The ECS-RMS provides a 4-pin interface to the code reader, which is standard across all CR2x and CR3x readers. The pin-out is described in Table 1.

| <i>Pin</i> | <i>Name</i> | <i>Description</i> |
|------------|----------------|---|
| 1 | VDC | DC Voltage from charge base |
| 2 | CHARGE_CONTROL | Charge current select. Low = 100mA charging rate, High = 500mA charging rate. Also used as a detection circuit for LED control. |
| 3 | GND | Ground return |
| 4 | BATTERY_IO0 | Trigger pass-through and charge base acknowledge. Active low. |

Table 1 - UMCP Signals

The ECS-RMS shall have protection circuitry that includes a 1.25-1.5A resettable fuse, reverse voltage input protection, overvoltage input protection and ESD spike suppression.

The trigger button shall be an active low tact-type switch which will be connected to net PIO_5 on the M3 modem schematic.

For the current UMC and M3 Modem schematics please reference C003685_01_Modem.pdf and C003158_03_UMC_Charger.pdf.

2.6 Interface and Communication

The ECS-RMS should enumerate to a USB port ensuring that power is always available for charging.

USB (Keyboard and Serial Emulation Mode (Bidirectional)). The device should be able to get power from a USB port. HID and HID POS

2.7 Compliance and Environment Requirements

FCC, CE, WEE, RoHS, REACH

Transportation Requirements

ISTA 3A

User Environment

Operating Temperature: 0° to 40° C / 32° to 104° F

Storage Temperature: -20° to 60° C / -4° to 140° F

Humidity: 5% to 95% non condensing

2.8 Accessories

Optional Weighted Base that can be attached for desk top applications.
This can be a simple metal plate.

2.9 Maintenance

The UMC/M3 combo should be very easy to install and service. Any moving parts should be easy to replace.

2.10 Documentation Requirements

Installation Guide

Configuration Guide

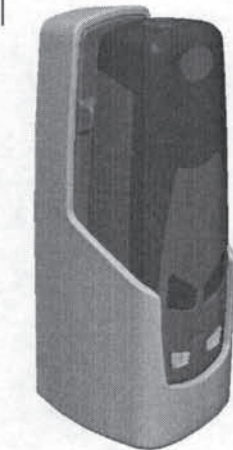
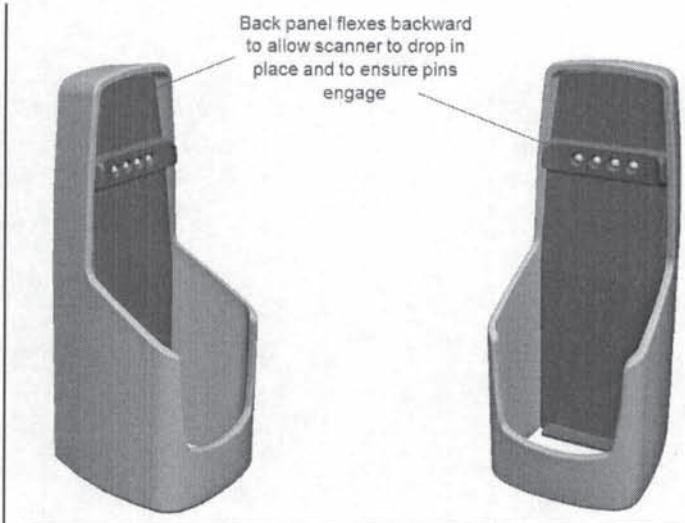
Reader Host Interface Document

2.11 Target Date for Initial Release to Production

July, 2011

3.0 Appendices

3.1 Renderings



Not Shown:

- LED light to indicate charging at on top section of charger
- Paging button on inside portion of charger
- Rubbermaid and Code Logo
- Bluetooth Bar-code label
- USB port and USB cable

FCC WARNING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.