



Understanding Rugged Devices for the Mobile Workforce



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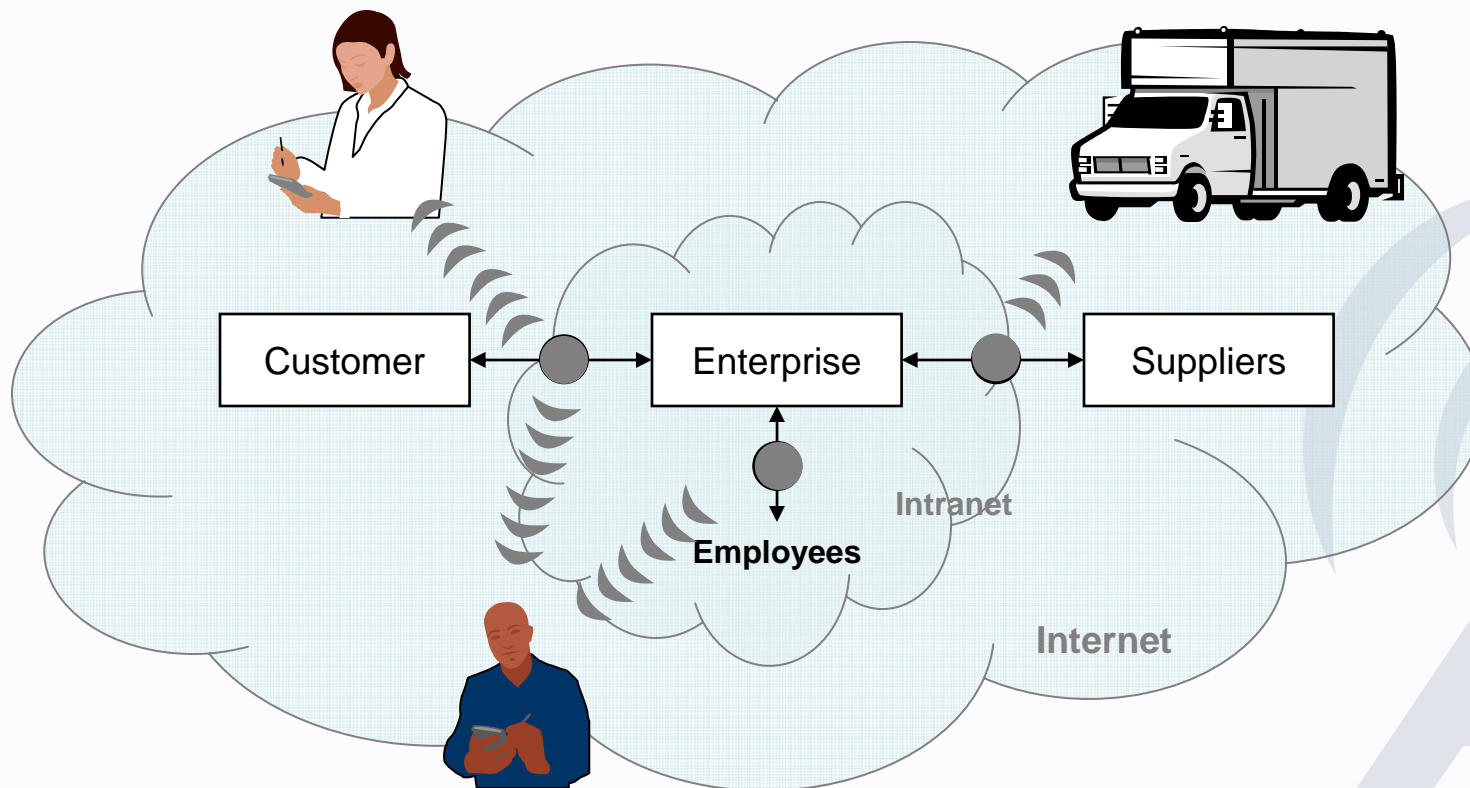


Technology Progression

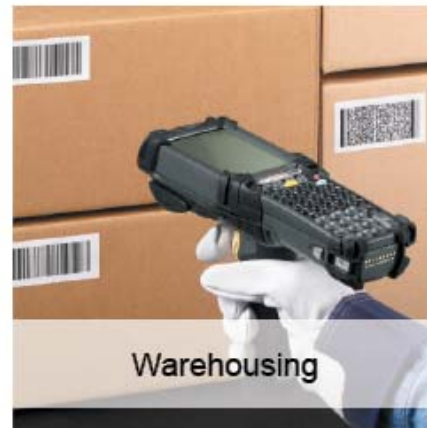
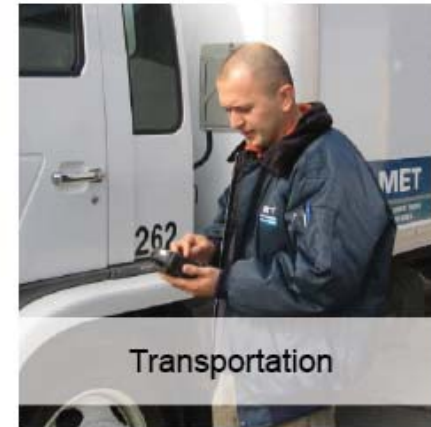


Convergence, Size, Speed, Storage, Functionality,
Connectivity

Business Value of Mobility



Rugged devices for the mobile workforce



Defining Durability

Subjective terms are confusing: (rugged, semi-rugged, durable, consumer-grade, enterprise-class, etc.) It is best to dig deeper.

Conditions

- Tumbling & Drop specs
- Temperature
- Moisture / Humidity / Submersion
- Dust and other particulates

Ratings

- IP
- NEMA
- I-Safe



What is an IP Rating?

IP = Ingress (entrance) Protection

First Numeral: Protection from solids (dust)

5: Not prevented totally – but does not prevent satisfactory operation.

6: Totally protected.

Second Numeral: Protection from liquids

0: No Protection.

1: Protection from falling drops of water & condensation.

2: Direct light streams of water unto 15% from vertical.

3: Direct sprays of water up to 60% from vertical.

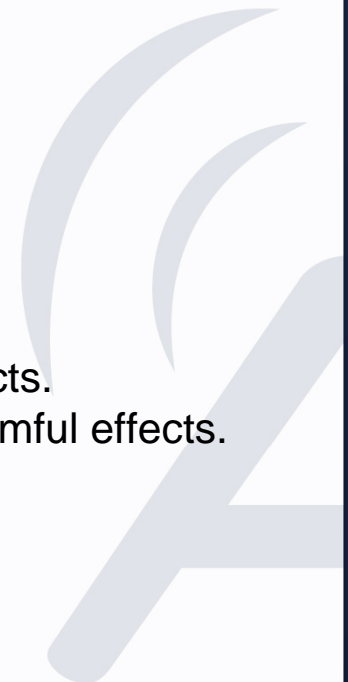
4: Water sprayed from all directions. Limited Ingress. No harmful effects.

5: Low Pressure water jets from all directions. Limited ingress. No harmful effects.

6: Strong jets of water. Limited ingress. No harmful effects.

7: Protected from the effects of temporary immersion.

8: Protected from the effects of continuous immersion.

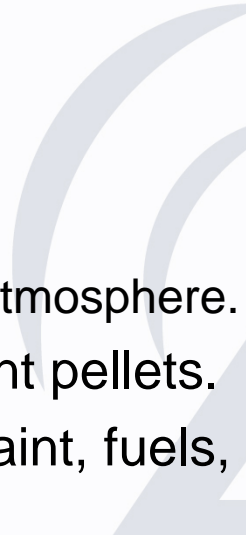


NEMA Rating



- **Nema** = National Electrical Manufacturer Assoc.
- Rating signifies a fixed enclosure's ability to withstand certain environmental conditions.
- NEMA ratings verify protection from external ice, corrosive materials, oil immersion, dust, water, and more vs. IP Ratings (only water & dust)
- Rarely applies to mobile devices – applicable with Wi-Fi infrastructure.

Intrinsically Safe

- Is an Underwriters Laboratories (UL) Certification that a product is fit for use in industrial locations where:
 - Flammable gases, (Class 1)
 - Combustible dusts (Class 2), and
 - Ignitable fibers (Class 3) may be present.
 - Each class has 2 divisions
 - D1: Air Always contains explosive materials
 - D2: Materials sealed & contained, only occasionally in atmosphere.
 - After Market Modifications fill devices with fire retardant pellets.
 - Industry Applications: Manufacturing environments (paint, fuels, chemicals, textiles, etc.)
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- A faint, light-colored graphic of a signal tower or antenna structure is visible in the background on the right side of the slide.

The Gold Standard

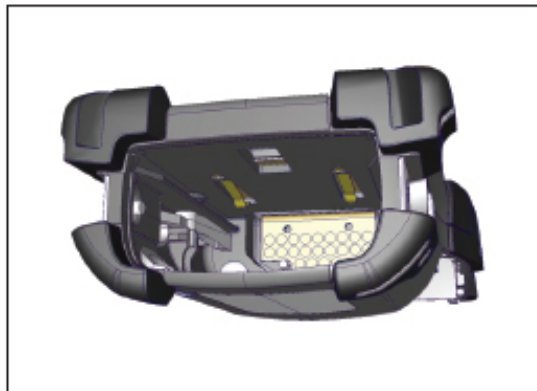
Motorola MC9000

- **Operating Temperature:** -20°C to 50°C
- **Storage Temperature:** -40°C to 70°C
- **Humidity:** 5% to 95% non condensing
- **Drop Spec:** Multiple drops to concrete from 6ft
- **Tumble:** 2,000 one meter tumbles at room temp. (4k drops)
- **Sealing:** IP64 (electronic enclosure, display and keypad)



Rugged By Design

- **Interlocking Torque-cell Design** – replaces traditional design using bosses.
- **Floating internal components** – stress is absorbed by the housing, not the circuitry.
- **Shock Absorbent Bumpers** – significantly reduce the shock absorbed by the housing.



Rugged By Design Cont.

- **Battery placement** – in the main housing rather than the handle.
- **Seal Improvements** - Insert and overlay Molding make the gasket and the housing one piece.
- **Field replaceable keypad** – one of the most damage prone components is easily replaceable.



See for yourself



Rugged Mobile Computing Market

Brand	Percentage
Symbol	33.6%
Intermec	13.0%
Psion Teklogix	6.3%
DENSO Wave	5.4%
Hand Held Products	4.4%
Motorola	3.6%
Casio	3.3%
PSC	2.7%
Unitech	2.1%
Fujitsu	2.0%
LXE	1.7%

World Wide Rugged Mobile Computer Market Share 2005



Mobile Printing

- Applications in most industries
 - Field Service
 - Healthcare
 - Route Accounting
 - Retail
 - Warehousing
 - Manufacturing
- Replacing the 3 part form and impact printing



Business Case for Wireless Mobile Printing

- 30% of field transactions involve exceptions, changes, additions, returns or promotions.
- Average warehouse worker spends 30 mins/shift walking to/from wired printers.
- Printing labels in advance and away from point of business is costly in terms of productivity and accuracy.

Rugged Mobile Printing

The Zebra RW Series


- Harsh conditions Operates in -20 → 55 °C
- Multiple drops of 6ft on concrete
- IP54 certified for windblown water and dust
- **Resilient Design Features**
 - Rounded corners distributes stress to better absorb impact
 - High impact modified plastic housings with Thermoplastic overmold to hold up during extreme drop testing
 - Distributed casing connections
 - Thermal print head is durable than other designs
- **Lots of Media Options**



Videos



Choosing the Right Device

- What is your application?
 - How does it need to be used?
 - Is it upgradeable?
 - What specifications are required? keyboard, memory, screen, battery, radio, scanner, imager etc.
 - What environment is it going to be used in?
 - Exposure to elements
 - Operating temperature
 - What is the budget?
- 

Total Cost of Ownership

- Enterprises that use low cost non rugged mobile computers pay a high price in **repairs**, increased **support** needs and **lost productivity**.
- **These costs exceed any purchase price savings within just two years.**
- Over the life of the system, down time typically costs enterprises that use non-rugged computers approximately **four to five times** more than the purchase price of the devices.

(Source: VDC, 2004)




Dealing with Down Time

- Spares Pool
- Warranty
 - Look for comprehensive “no questions asked” policies.
 - Easier for budget than self insurance.
 - Turnaround varies (from next day to next week)
- The SIM card advantage
 - No need for live devices
 - No need for carrier interaction
 - GPRS is 82% of the market – most available devices



Conclusion

- Mobile computing is growing rapidly, increasingly in the industrial space.
 - Before choosing a device, understand specification designations, vendor product compliance and application usage conditions.
 - Downtime, repairs and replacement costs of choosing a less-rugged device than needed outweigh initial savings.
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- A faint, light blue graphic in the bottom right corner of the slide, consisting of a signal icon (three curved lines) and a stylized letter 'A'.

Thank-You

Questions & Answers

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