Fingerprint Cards Capital Markets Day 2016

Leading the market in biometric systems solutions
FORWARD-LOOKING STATEMENTS
The presentation contains forward-looking statements with words such as “believes”, “anticipates”, “outlook”, “confident”, meeting” and “expects” about expected revenues and earnings, anticipated demand for fingerprint sensors and internal estimates. These forward-looking statements involve a number of unknown risks, uncertainties and other factors that could cause actual results to differ materially. Unknown risks, uncertainties and other factors are discussed in the “risk report” section of Fingerprint Cards´ Annual Report 2014 and in the Interim Reports.
Today’s agenda

• A growing market
• Market leadership
• Innovation leadership
• Profitable growth

13.00 Update on 2016 guidance

First session
13.15 – 14.50 A growing market and market leadership
14.50 – 15.10 Q&A
15.10 – 15.30 Break

Second session
15.30 – 16.55 Innovation leadership and profitable growth
16.55 – 17.15 Q&A
Capital Markets Day
Fingerprint Cards AB – FPC®

December 8, 2016
Leading the market in biometric systems solutions

• Fingerprint Cards ambition is to become the technology and product leader in the biometric space
• This is the start of the biometric era, ranging from devices to cloud
• We will be market leader in our chosen segments
• New organization to execute on the strategy
Megatrends that affect us

- Biometrics
- Security and convenience
- Cloudification
- Online payment/banking
- Digitalization (IoT)
Future possible applications... and many more

- E-look
- Car (door)
- NB
- Tablet
- Smartcard
- Car (starter)
- Smart watch/Bangle
- Portable HD
- Remote controller
- Motorcycle/Bicycle
- POS
- USB disk
- Car key
- Bicycle lock
- Home applications

Source: WPI
We are only at the beginning of the biometric era

Source: Fingerprint Cards estimates on device shipments based on various industry sources.

*Size indication of card donut only representing smartcards.
15 B units represent both smart and “non-smart” cards not including SIM, phone or Pay-TV.
New segments expand the market

• Strong market growth in fingerprint sensors
• New segments to add substantial value for Fingerprint Cards in 2018
Strategy for growth

Segments

- Existing
  - Other segments
    - PC
    - Internet of Things
    - Automotive
    - Industrial and medical
  - Smartcards
    - Sensor adaptation
    - Utilize scale advantages
    - Strong growth potential

- New
  - Grow with the existing customer base
  - Add new customers
  - Extended biometric scope
    - Trackpad
    - Higher security
    - More features
  - New offerings
    - Other sensors
    - M&A opportunities

Offering
Strategy outline

1. Short term (2017)
   - Defend and strengthen Fingerprint Cards position further in smartphones.
   - Enable the roll out and kick-starting the new segments
   - Continue innovation and strong IP portfolio

2. Mid term (2017-2018)
   - Fingerprint Cards as a biometric company with several modalities
   - Strong SW and system capabilities
   - Investment in new vertical – Smartcards, PC and embedded (IoT, Automotive)

   - Biometrics secure authentication and convenience everywhere
   - Cloud and device in symbiosis
   - Security as core in biometric offering
Focus of new investments to execute on strategy

- Mobile
- Smartcards
- PC and embedded (IoT, Automotive)
1. Fingerprint sensor attach rate increasing → market is increasing
2. Competition is here – anticipated, we are prepared
   - Complete and competitive product offering
     • Winning designs in all segments, from cost centric spray coated to under glass flagship models
   - Industry unique wide customer base
   - Well established sales and support organization close to partners and customers
   - Proven scalable supply chain
3. Continued investment to further address second tier manufacturers and emerging markets
• Leading fingerprint biometric solution supplier for the smartcards market
• Engaged with all major card providers
• Products (FPC1320/FPC1321) available in commercial volumes now, ISO compliant on card level
• Pilots and initial volumes in 2017, revenues taking off in 2018
PC and embedded (IoT, Automotive)

- High reuse from the Mobile portfolio
- Roll out of biometric module enables the IoT market
- Design wins with launch target in 1st half 2017 in the PC segment
- High growth area for Fingerprint Cards
- Long term: cloud-based biometrics
Guidance for 2017

- Revenues: 7,500 – 9,500 MSEK
- Operating margin: At least 35%
Global leader in biometrics

- Fingerprint Cards ambition is to become the technology and product leader in the biometric space
- This is the start of the biometric era, ranging from devices to cloud
- We will be market leader in our chosen segments
- New organization to execute on the strategy
Jan Johannesson
VP Strategic Planning & Portfolio Management
Strong potential in a growing market

• Fingerprint Cards has so far just scratched the surface of the biometric opportunity
  – The Company is uniquely positioned to lead the market expansion
• Fingerprint Cards strategic focus is on both devices and system
The move from unlock to pay... and beyond

First Era
Proven viability at scale
• Single platform
• Single use case

Second Era
Use case expansion
• High trust use cases on mobile
• Second modality emerges
• BioCard first developments

Third Era
Broad-based adoption
• Multiple platforms
• Sensor fusion
• Combined device experiences

Market experiments 2014-2016
Market experiments 2017-2018

2019-2025
Megatrends

• Broad acceptance of biometric based mobile payments in Asia
• Growing acceptance of biometric based bank access globally
• Use of biometrics in smartcards for payments and for access control starts to emerge
• Ongoing development of connected biometric enabled devices
New segments expand the fingerprint market

- Continued strong market growth in smartphones
- The market for biometric smart cards is expected to expand rapidly in 2018
- Attractive growth opportunity in PC – low penetration rate

Source: Strategy Analytics, IHS, Fingerprint Cards estimates.

Total Addressable Market (in million units)

CAGR 2016-2019: 74%

- Mobile
- PC
- Smartcards
- IoT/Automotive

Source: Strategy Analytics, IHS, Fingerprint Cards estimates. Total Addressable Market excludes Apple, includes all other OEMs and segments including swipe technology.
Expanding portfolio

Under glass

Ceramics

Spray coating

Smartphones

FPC1268

FPC1235, FPC1245

FPC1028

FPC1035, FPC1155

FPC1025, FPC1145

Low

Medium

High

Smartcards

Smartcard solutions

PC and embedded solutions

PC solutions

Embedded solutions (FPC-BM)
Sensor penetration in the smartphone market some 50% – still large business potential for Fingerprint Cards
Mobile business – growth continues

Strong market expansion from the high tiers to cover the complete smartphone market.
Mobile business – a full system approach

• System approach
  – Sensing die
  – Algorithm asset
  – Coating and under glass capabilities
  – SW integration
• Close customer relationship throughout the mobile value chain
• Key success factors include a fully deployed product portfolio and customer responsiveness
1. Smartcards

• Well positioned to serve the smartcard ecosystem
  – ISO compliance on card level reached with the FPC1300 series of sensors
  – Low power consumption and high accuracy
  – Adapted for high volume production
  – Complete biometric system offering

• Total Addressable Market (TAM) for fingerprint sensors in smartcards expected to expand rapidly in 2018

• A 3 to 4 billion gross market (units)
Smartcards business model

Smartcard module
Card SW (algo, system)
Production SW and tools

Partners
(10 – 15)
Card manufacturers

Issuers
(1,000’s)
Banks

Cardholder
(1,000,000’s)
Users
2. PC business

- A complete PC offering
  - Significant breakthroughs made in 2016
    - launches of the Huawei Matebook and HP Elite X3
    - significant synergies with the smartphone offerings
- TAM for Fingerprint sensors in PC’s moves from approximately 40 million units in 2016 to >100 million units in 2018
- A 300 million gross market (units)
The segment for IoT includes everything from wearables to smart homes and devices.

Automotive segment
- security
- convenience

Total Addressable Market (TAM) for IoT expected to expand rapidly in 2018

A 3 to 4 billion gross market (units)
Strong growth opportunities beyond smartphones

- Strong market fundamentals
- Market leadership in smartphones forms a significant platform
- Continued innovation secures future growth in new segments
Three drivers of global engagement excellence

1. Sales to device OEMs
   - Sales, support and market requirements

2. Platform providers
   - Platform integration, evolution and security

3. Commercial & government specifications
   - Creating market pull and ensuring favorable regulatory frameworks
Local engagement to leverage megatrends

Platforms, standards and security
- Google
- Microsoft
- EMVCo
- Fido Alliance
- GlobalPlatform
- Other

Standards
- Alipay
- UnionPay
- Fido Alliance

OEM opportunities

OEM opportunities

Standards
- Aadhaar
Trend: Platforms getting serious about hardware
US case study: Google and Fingerprint Cards in collaboration

Google + FINGERPRINTS = Accelerated use of fingerprint sensors on android handsets globally

Development timeline

- **2014 to early 2015**
  - Collaboration with Android team to develop fingerprint sensor HAL for Android M release
- **May 2015 (Google I/O conference)**
  - Announcement that Fingerprint Cards supported Google in the development of fingerprint sensor technology for mobile devices

Commercial engagement timeline

- **2014**
  - Deep collaboration with the Google Nexus team on HW, SW and industrial design elements of Nexus smartphone fingerprint sensor design
- **September 2015**
  - Google Nexus 5X and Nexus 6P launch with Fingerprint Card’s OneTouch® FPC1025 fingerprint sensor solution
- **October 2016**
  - Pixel & Pixel XL Phones launch with Fingerprint Card’s OneTouch® FPC1025 fingerprint sensor solution including FPC gesture/navigation capability and enhanced security software
Highly trusted partner
- Sales to device OEMs: Sales, support and market requirements
- Platform providers: Platform integration, evolution and security
- Commercial & government specifications: Creating market pull and ensuring favorable regulatory frameworks

• Significant influence and growth potential
  - Existing proven platforms: Mobile and PC
  - New product categories: Cards, IoT, wearables
  - OS/Service platforms → Hardware
Charles Burgeat
Head of Sales

Ted Hansson
Country Manager Greater China
Fingerprint Cards in Asia

- Xian
- Chongqing
- Beijing
- Shanghai
- Taipei
- Shenzhen
- Tokyo
- Seoul
- New Delhi
Kenneth Fredriksen
CEO Huawei Sweden
Expanding our footprint

2016 fingerprint sensor penetration in smartphones: above 50%

Global smartphone vendor market share %, Q3 2016

- Launched phones with competitor or inhouse
- Has not launched phone with fingerprint sensor
- Launched phone with FPC sensor

Source: Strategy Analytics, FPC estimates
Strong presence and an attractive broad portfolio
Business potential in the third-party mobile payment market in China
Mobile payments
Strong growth in China’s third-party mobile payment market

Third-party payments in China authenticated by fingerprints

Source: Sunrise research institute
(Film spelar)
Value added functions

- Navigation
  - Slide down for notification board
  - Slide up for shortcuts
  - Slide left or right to switch between apps
  - To replace the Android side keys
- Different fingers open various apps
- Only one tap
  - To enter personal desktop
  - To launch Alipay
  - Snapshot
  - Screen shot
Further growth opportunities with Asian customers

• Maintained market leadership in China since 2014
• Continued innovation to capture growth
• New business opportunities in markets and applications
Pontus Jägemalm
Senior VP Research & Development

Farzan Ghavanini
Manager, Alternative Sensing Technology
Total Addressable Market (in million units)

- **161 devices** launched by Q316
- **>50% market share**
- **>10 billion touches** per day

Source: Strategy Analytics, IHS, Fingerprint Cards estimates.
Total Addressable Market excludes Apple, includes all other OEMs and segments including swipe technology.
A sense of technology

• A global technology leader
  – Unique and extensive experience in touch fingerprint sensor technology
  – Leading technology and products
  – Full system know-how and IP
  – Robust and scalable solutions

• Dedicated staff
  – 250+ R&D engineers
  – High competence
  – High educational level
  – ~25% PhDs
Research & Development at Fingerprint Cards – Roles and capabilities

Product development and qualification

Transfer to production at multiple sites

Solving production and yield issues

Improving the products throughout the lifecycle (maintenance)

Research and long-term development of new technology and IP
A broad IP portfolio

- >120 granted patents
- Increased innovation capacity and innovation speed
- Actively monitoring new patent applications and competing technology
- Capacity for running multiple technology projects in parallel
- Constant pipeline of new solutions
• The mobile phone use case is changing
  – Front side in addition to back side and side-mount
  – Industrial design requirements
  – Need for seamless fingerprint sensor integration
• New challenges due to thicker materials on top of sensor
• The FPC1245 success with ceramics
  – First FPC under glass solution
FPC1268, for glass based applications

- First true under glass sensor
  - For home buttons with glass
  - Mounting under cover glass for a seamless design
- Integrated in Huawei Mate 9 Pro + Porsche Design
  - First customer product launch with FPC1268
- Enabled through our holistic offering
  - New sensor and companion chip design
  - Novel packaging design
  - Significantly improved algorithm solutions
  - Software and tuning tools for production
Alternative sensing methods

• Our active capacitive technology is evolving rapidly
• In parallel, actively working with alternative sensing principles
• Ongoing development
  – Specific aspects on integration with the display
• Dedicated team for development
  – Increased focus
Pontus Jägemalm
Senior VP Research & Development

Farzan Ghavanini
Manager, Alternative Sensing Technology
Fingerprint sensing evolution
The challenges

Two fundamental challenges must be solved

I
The sensing elements must be somehow integrated with the display

II
Displays are protected by a rather thick cover glass and the sensor must be able to read through it

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<table>
<thead>
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<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>No significant impact on the display image quality</td>
<td>Minimum power consumption increase</td>
<td>Ease of use with proper wake-up function</td>
</tr>
</tbody>
</table>
Capacitive technology and display integration
Would it be possible to increase the resolution in common P-Cap touch technology to achieve in-display Fingerprint sensing?

Source: http://digi-pro.com

US patent 8,564,314
Would it be possible to get an acceptable signal using a technology such as transparent TFT (ThinFilmTransistor)?
Can we integrate the fingerprint sensing within the display pixel (such as in-cell touch) and hence get access to the TFT backplane?

Source: http://www.j-display.com/
The **ideal** capacitive fingerprint sensor

The **actual** capacitive fingerprint sensor

- In an actual device, each pixel receives signals from neighboring areas
- This effect gets exponentially stronger with thicker coating/glass
Advanced detection schemes

Fingerprint Cards has invented and continues to invent detection schemes that allows for smaller and smaller amount of electric charge to be detected
The root of the Challenge

What is the root of the Challenge?

**Dynamic Field**
- Propagating wave
- Sound, Light

**Static Field**
- No propagating wave
- Electrostatics
- No Focusing
Ultrasonic technology and display integration
Ultrasound FP sensing – concept

Non-Echo based

Echo based
Ultrasound FP sensing - concept

Non-Echo based

Echo based
Echo based pixel array

Many different pixel implementations

Piezo based
MEMS based
MEMS/Piezo based

Beam forming
Optical technology and display integration
Traditional optical fingerprint sensors

Flat optical fingerprint sensors
Many different implementations of the pinhole array

- TFT backplane
- CMOS backplane
## Summary of alternative sensing

<table>
<thead>
<tr>
<th></th>
<th>Capacitive</th>
<th>Ultrasonic</th>
<th>Optical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Integrate-ability</strong></td>
<td>Excellent</td>
<td>Good</td>
<td>Limited</td>
</tr>
<tr>
<td><strong>Thickness handling</strong></td>
<td>Limited</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td><strong>Main advantages</strong></td>
<td>Maturity, simplicity, inexpensiveness</td>
<td>Beamforming, wide range of cover material (glass, metal...)</td>
<td>Very high resolution, thickness handling</td>
</tr>
<tr>
<td><strong>Main disadvantage</strong></td>
<td>Exponential defocusing with cover thickness</td>
<td>Low maturity, cost, complexity</td>
<td>Power consumption, visual impact on display, require (IR or visible) cover transparency</td>
</tr>
<tr>
<td><strong>Summary</strong></td>
<td>An unbeatable fingerprint sensing technology for integration under thin, electrically non-conductive materials. Integrating the capacitive technology with display will almost certainly depend on the reduction of the thickness of cover glass.</td>
<td>A promising technology with the capacity of reading through thick and both electrically conductive and non-conductive materials. A number of display integration alternatives are available, although it still has low maturity and is expensive.</td>
<td>A technology capable of obtaining a high resolution image under a thick cover glass. The integration within the display panel would most likely have noticeable negative impact on the visual performance of the display.</td>
</tr>
</tbody>
</table>
Evolution of the performance and applications

- Alternative sensing development complement to active capacitive sensing
- Large portions of the system remain the same
- Strong track-record in continued performance improvement with capacitive
- New application areas for capacitive technology
Driving the market leading biometric performance

- In-house algorithm and software optimized for smartphones
  - Improved security
  - Convenience for all finger types
  - Latency
  - Memory
- The FPC1028 – our smallest sensor
- Finger detect functionality and power consumption

FRR = False Rejection Rate – convenience level
FAR = False Acceptance Rate – security level
Spoof finger detection – FPC SafeTouch™

• Introduction of FPC SafeTouch™
  – Augments security by allowing rejection of verification attempts using so-called fake fingers (spoofs)
  – Improves the already inherently good anti-spoofing ability of Fingerprint Cards sensors
  – Takes advantage of the advanced sensor design
  – Is compatible with existing range of Fingerprint Cards sensors

• Increased security
  – With small average cost in decreased convenience (increased FRR; False Reject Rate)
  – Value-add for e.g. payment use cases

• Differentiating feature
Delivering trust to our customers

Higher Security
Best-in-class fingerprint sensor
4 Level Fingerprint with 3D fingerprint
Self-learning accuracy
FIDO certification

4 Level Highest Security Fingerprint
Level 1 Ridge flow
Level 2 Ridge formation
Level 3 Ridge path deviation
Level 4 3D Ridge depth
Trusted biometric solutions

- Supporting all the major mobile platforms and secure environments
- Includes navigation/track-pad support enabling convenient one-handed interaction with the device
- Great example of integration in Google’s Pixel phone
Sensor systems dedicated to cards

• Success factors
  – Solid biometric performance embedded in the card
  – Low power consumption
  – Ultra-thin package
  – Card needs to be bendable
  – Resistant to scratches and everyday wear-and-tear

• Card applications
  – Targeted into FPC1320 and FPC1321

• High security and convenience

• The next generation system under development
  – Targeting an extremely low power consumption
R&D takeaways

• Advanced technology made simple
• Strong innovation capacity and new products for continued mobile success
• Alternative sensing principles are being developed in parallel to capacitive technology
• Bringing our technology into products for new segments
• Brilliant engineering team growing beyond 250 engineers and recruiting
Actual wafers shipped out from Fingerprint Cards
Scalable and efficient business model

- Fabless operation
- In cooperation with two of the global top four pure play foundries
- Dual fab qualified to secure capacity and supply for all high volume products
Scalable and efficient business model

• High volumes in multiple fabs
• Flexibility and ability to quickly scale up of capacity from already high levels
• Established supplier relations
• High flexibility
• Outsourced Semiconductor Assembly and Test partners
  – qualified by Fingerprint Cards to service Module houses
Highly scalable and efficient business model

Software customization and integration

HW design/customization support

Shipment of sensors

OEM/ODM
Industrial Design, integration, tuning and end-user experience

Module house
Packaging and module manufacturing

Distributor
Warehouse and Logistics
Centralized warehouse and distribution in Hong Kong using 3PL (third-party logistics)
- Attractive KPI: Very low Transport and Warehousing/Sales (TPW/Sales)
- Enables flexibility and shorter lead times
Framework for growth

Expanding our capabilities – in R&D, customer integration and business development

Drive sustainable, profitable growth

Build the backbone for efficiency and compliance
Sustainable revenue growth

Fingerprint Cards and the market

Source: Fingerprint Cards published financials and Fingerprint Cards market estimates
Trends in pricing and gross margins

- Normal high tech pricing trends and dual sourcing
- Innovation differentiates
  - meeting customer requirements
  - drives customer value
  - positive impact on costs
- Distribution mode can drive scalability
• Focused investments in innovation and business development
• Profitability guidance 2017
  – At least 35% operating margin
• Reporting change in P&L in 2017
• Gross to net R&D expenditures in the P&L

**R&D expenses and capitalization**

<table>
<thead>
<tr>
<th>SEK M</th>
<th>Tot Act 2015</th>
<th>Tot Acc Q3 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross R&amp;D spend</td>
<td>194</td>
<td>249</td>
</tr>
<tr>
<td>Capitalization</td>
<td>-17</td>
<td>-57</td>
</tr>
<tr>
<td>Depreciation</td>
<td>29</td>
<td>22</td>
</tr>
<tr>
<td>Net R&amp;D spend</td>
<td>205</td>
<td>214</td>
</tr>
<tr>
<td>Capitalization %</td>
<td>9%</td>
<td>23%</td>
</tr>
</tbody>
</table>

**Profit&Loss reporting change from 2017**

<table>
<thead>
<tr>
<th></th>
<th>Reported Jan–Sep 2016</th>
<th>Restated Jan–Sep 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>5,019.6</td>
<td>5,019.6</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>-2,569.2</td>
<td>-2,569.2</td>
</tr>
<tr>
<td><strong>Gross profit</strong></td>
<td><strong>2,450.4</strong></td>
<td><strong>2,450.4</strong></td>
</tr>
<tr>
<td>Selling expenses</td>
<td>-125.8</td>
<td>-125.8</td>
</tr>
<tr>
<td>Administrative expenses</td>
<td>-79.5</td>
<td>-79.5</td>
</tr>
<tr>
<td>Development expenditure</td>
<td>-191.7</td>
<td>-191.7</td>
</tr>
<tr>
<td>Other operating income/expenses</td>
<td>12.1</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Operating profit</strong></td>
<td><strong>2,065.5</strong></td>
<td><strong>2,058.1</strong></td>
</tr>
<tr>
<td>Finance costs</td>
<td>0.6</td>
<td>8.0</td>
</tr>
<tr>
<td><strong>Profit before tax</strong></td>
<td><strong>2,066.1</strong></td>
<td><strong>2,066.1</strong></td>
</tr>
</tbody>
</table>
• Efficient operating model in place
• Focus going forward
  – Long term growth more important than quarterly cash flow
  – Strong balance sheet
• Competitive working capital metrics
• Long term capital structure
  – Primary use of cash: long term growth opportunities
  – Strong balance sheet is essential to be a credible partner in new markets
  – Ambition to return excess capital to shareholders

Operating cash flow before R&D SEK 2.2 bn, 2014 – Q3 2016
People and culture

- Recruit for long term growth
- Focus on our culture to attract and retain talent and motivation
- Create fundamentals for a sustainable and compliant company
Sustainable profitable growth

- Strong innovation focus
- Flexible delivery capacity
- Solid financials
- Continued investments for growth
Christian Fredriksson
President & CEO
At the beginning of the biometrics era

- Growth continues – strong potential ahead in new and existing segments
- Market leadership
- Innovation leadership
- Profitable growth
Today’s speakers

Christian Fredriksson
President & CEO

Jan Johannesson
VP Strategic Planning & Portfolio Management

Charles Burgeat
Head of Sales

Ted Hansson
Country Manager Greater China

Kenneth Fredriksen
CEO Huawei Sweden

Pontus Jägemalm
Senior VP Research & Development

Farzan Ghavanini
Manager, Alternative Sensing Technology

Jonas Spannel
Senior VP Operations & Quality

Johan Wilsby
CFO
Thank you for your attention!

For further information please contact: investrel@fingerprints.com