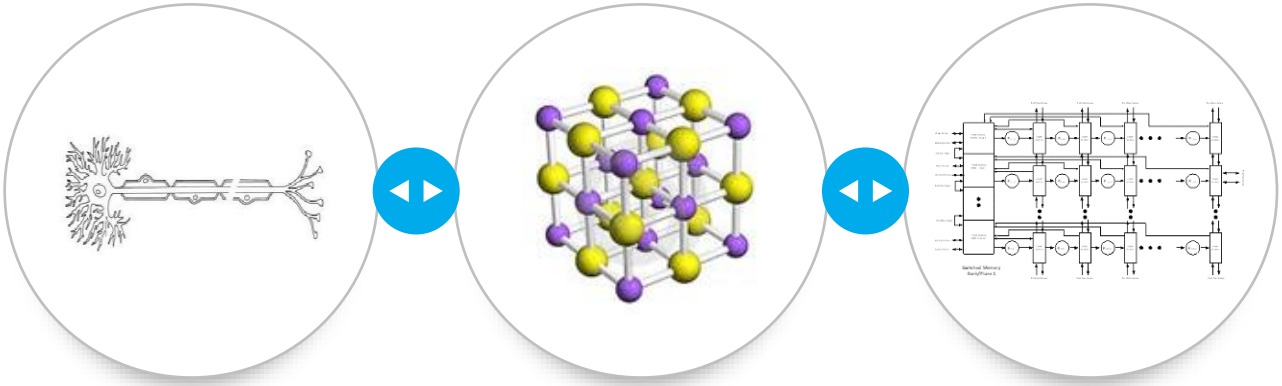
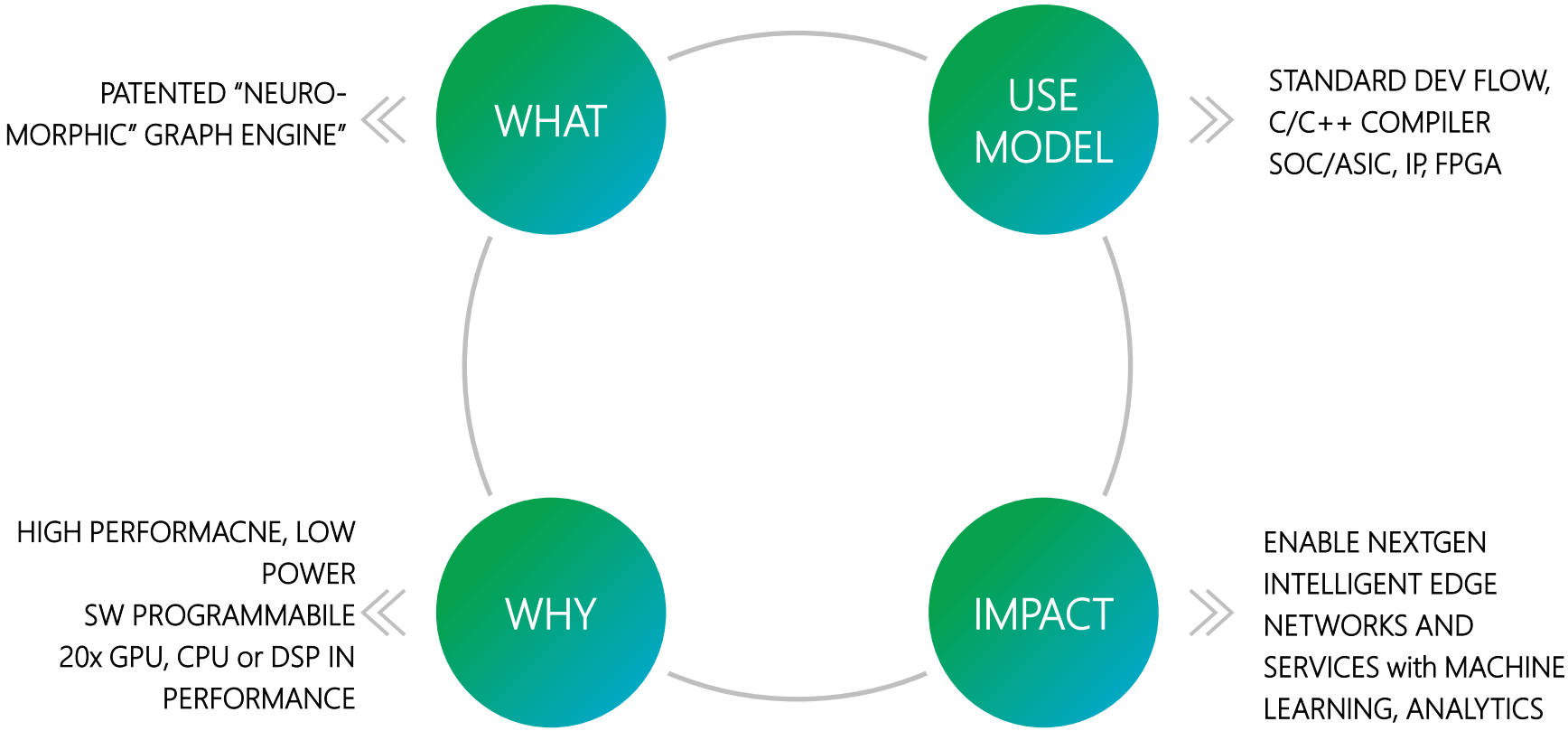
Xceler Systems Inc.

Enabling The Intelligent Edge



Introducing Xceler Systems Inc



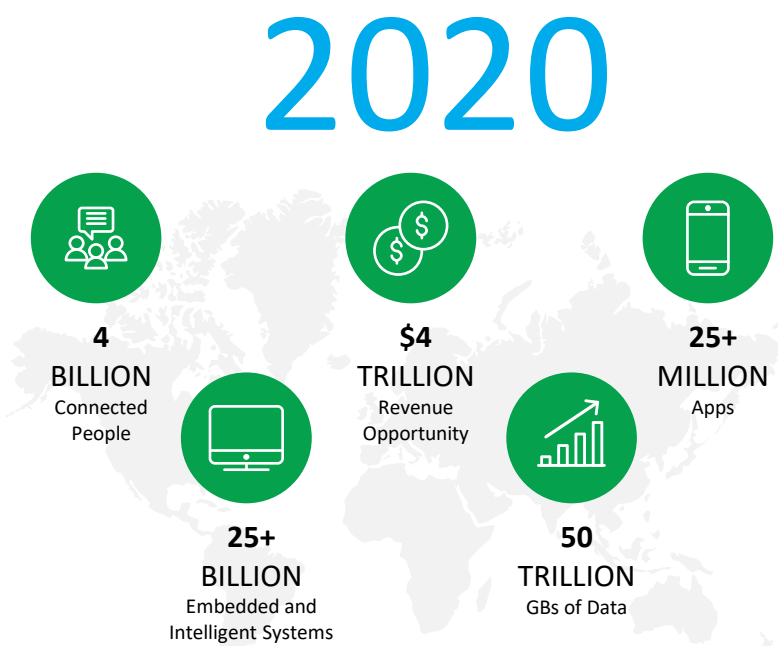
Opportunity Summary

Machine learning and AI have to work both on the edge and cloud

PROBLEM

Current edge processing platforms cannot run any machine learning and AI algorithms and stacks

- **B2B market presents a big opportunity, most solutions focused on B2C**
- **Massive Amounts of Data Needs Analytics, Computing, Algorithms, Formatting at all stages of the chain**
- **Current solutions are not suitable for the EDGE: price, power, performance and ease of use are key**



Xceler FOCUS

CLOUD SAM

Data Analytics
Machine Learning Image Processing
Stochastics
Signal Processing

NETWORKING SAM

Control Plane
Acceleration
NFV
Support for New Services

EDGE SAM

Smart SoC for IoT Sensor Data Fusion, Image Processing
ADAS, Machine Learning
Robotics and Controls
Data Analytics and ML

What the Industry is Saying

01

"IDC - At least 40 percent of IoT-created data will be stored, processed, analyzed, and acted upon close to or at the edge of the network by 2019

02

"IDC estimates that one percent of applications across all industries have some type of cognitive technology or artificial intelligence powering those experiences,". In two years they predict that number will exceed 50%. So more than half of apps will have some type of cognitive technology or AI in them."

03

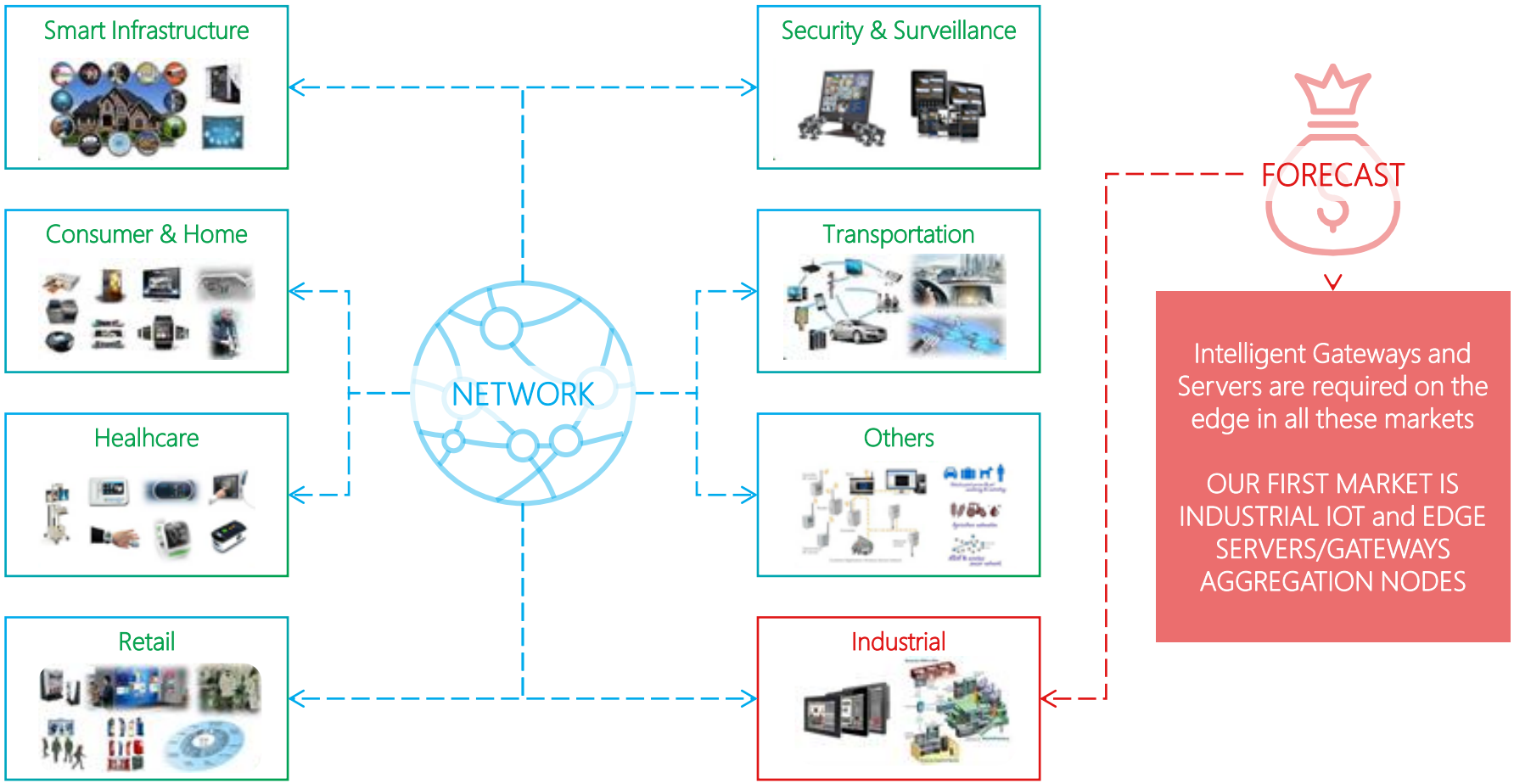
"The Edge will eat the Cloud"

Thomas Bittman VP Gartner: The agility of cloud computing is great – but it simply isn't enough. Massive centralization, economies of scale, self-service and full automation get us most of the way there – but it doesn't overcome physics – the weight of data, the speed of light

All of this requires processing power and storage, lots of it. And data analytics tools. And tools to push software and data to the edge. And tools to federate across the edge, and with the centralized cloud. And machine learning on the edge itself.

The edge will need some serious muscle

Addressable Markets on the Edge



FIRST TARGET MARKET IS INDUSTRIAL IoT

PROBLEM STATEMENT

TYPICAL IoT DEPLOYMENT ARCHITECTURE

Current solutions target here (Cloud Analytics)

Xceler Systems Target Market

Sensor Aggregation Edge Gateways Embedded Computers Edge Servers

sdxcentral.com

Massive Amounts of Real Time Data generated at Edge
Real Time Analytics requires Real Time Computing

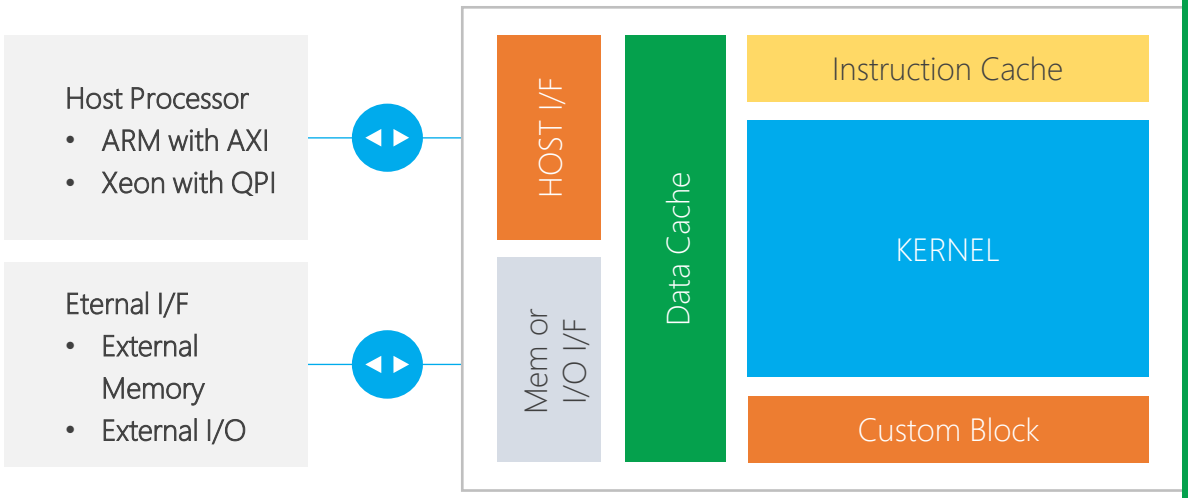
SOLUTION: PLATFORMS BUILT on XCELER

TOOLS and METHODOLOGY

C/C++ COMPILER/Emulator

Runtime Libraries
User Generated Libraries
For ASIC, SoC, FPGA

NOVEL HARDWARE PLATFORM



Compiler Generates Instructions Schedule for Engine

Several Patents Pending Covering Tool, Processor, Power

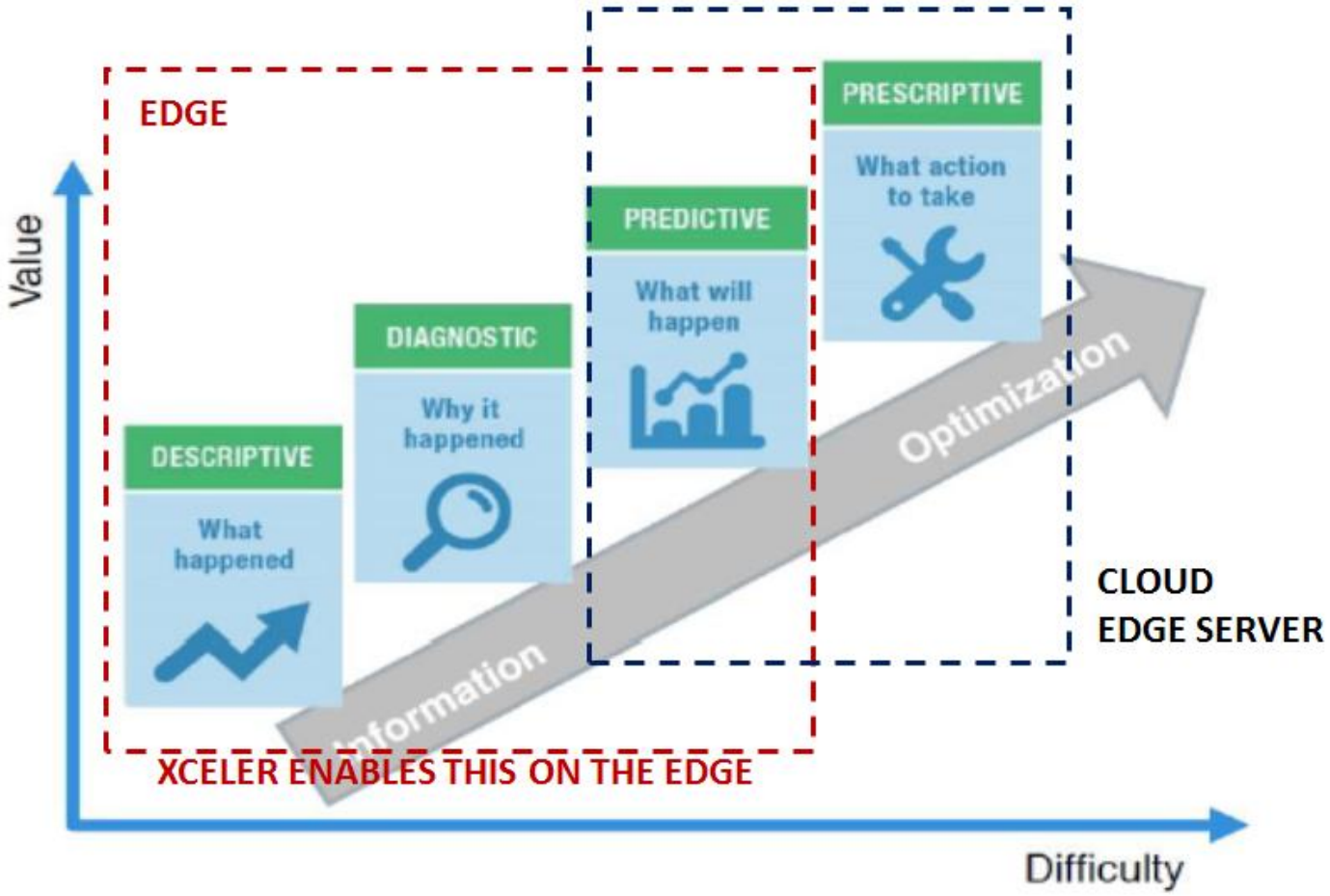
We will deliver complete Platform Engine and software

Libraries for deep learning and Machine Learning Signal Processing

A compiler for C/C++ development flow delivered to users

99% of developers who do not write RTL or CUDA addressed

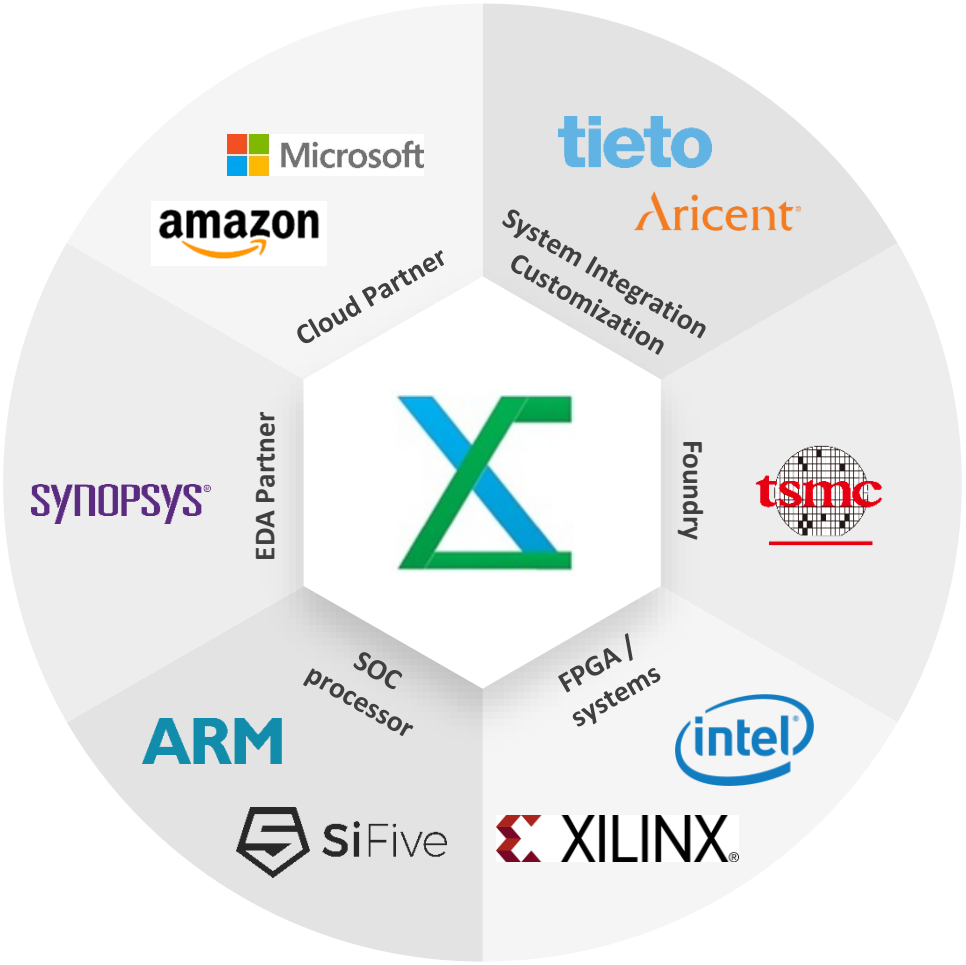
Use Cases



Ideal Applications have Hard-Real Time Requirements, wide sensor arrays, expensive or impossible to send to cloud (Amount of Data or Frequency of Updates)

GTM strategy and plan

Partner with vendors and Others in the value chain to get to end customers



XGE Engine SOC / FPGA

REAL TIME PROCESSING
Machine Learning, Analytics

XGP Engine ASIC / FPGA Cards

REAL TIME PROCESSING
Deep Learning, Machine Learning
Signal Processing with Software

XGC C/C++ COMPILER

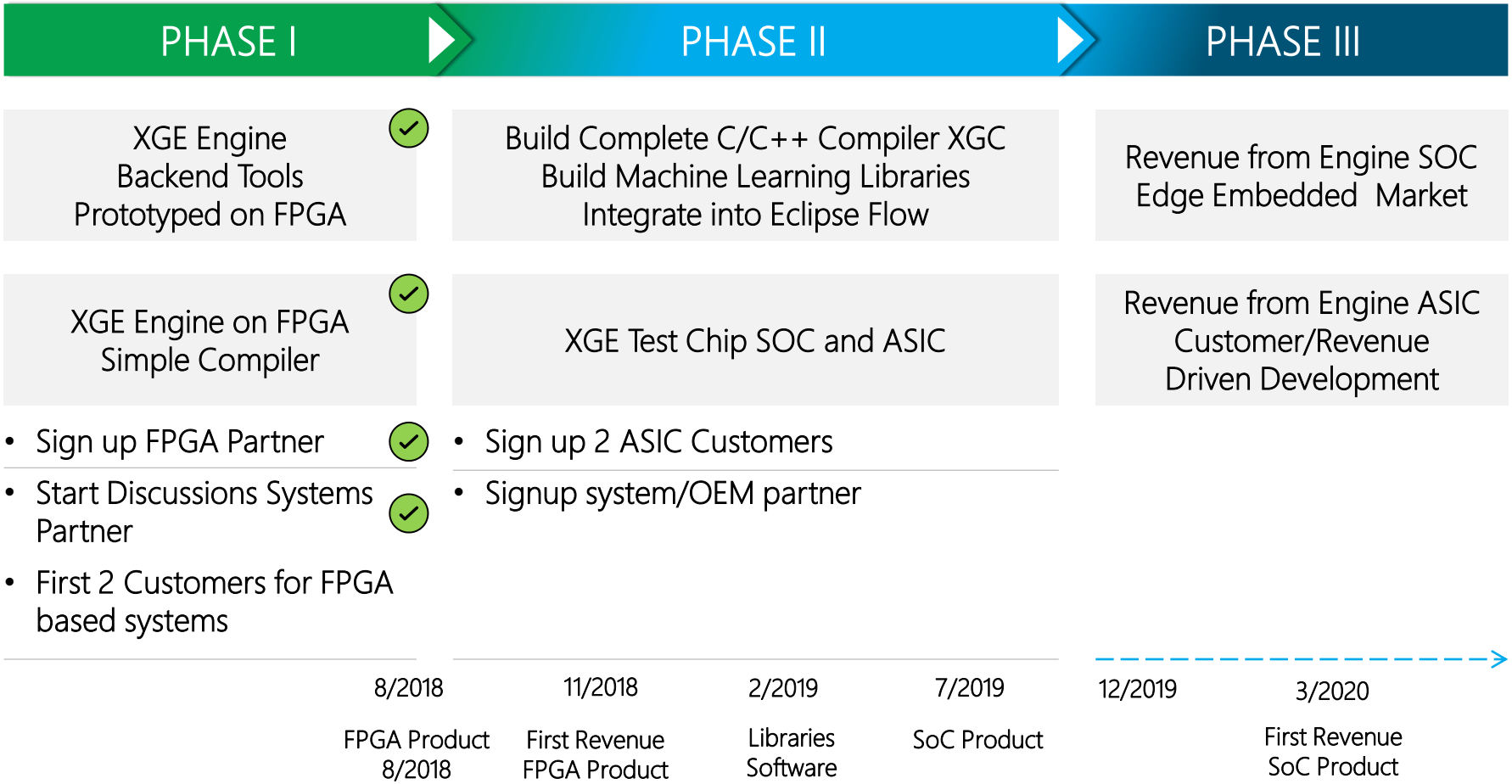
Runtime Libraries
User Generated Libraries
For ASIC, SoC, FPGA

Working with Ectron, Xilinx exploring Intel, Microsoft, Amazon

GTM TARGET Partner Ecosystem

	FPGA	ASIC	Customer/Partners	Status
SOFTWARE	Xilinx	Synopsys		Xilinx Partnership signed for FPGA SW, Devices and pricing
	Intel/Altera	Third party Design house		Intel Discussions ongoing
DEVICES	Xilinx	TSMC		Xilinx Supplying devces at special pricing
	Intel/Altera			Intel discussions ongoing
BOARDS	Ectron	Ectron	Ectron: CAT	CAT waiting on us to deliever system
			Ectron: Honeywell	Tentive preliminary discussions
			Ectron: Allen Bradley	Allen Bradley is waiting for Ectron to launch Xceler based products for IoT with Machine learning capability
			Xceler: Tata Communications	Preliminary Discussions ongoing
			Xceler: Wind Turbine Manufacturers	Waiting to finish CAT POC
			Xceler: Others	Focussed on PoC and Preliminary Product Dev
SYSTEMS	Ectron/Xceler	Ectron/Xceler		Wroking with Ectron to develop products: Phase I is FPGA, Phase II will be ASIC
				Light Weight Industrial Gateways
				Embedded Ruggedized Computers
				Engine Monitor/control

GTM alignment with milestones



We have a POC Starting Shortly and Are in Discussions with Other Potential Customers

IoT and Analytics Chain: Xceler Focus

Sensor Array

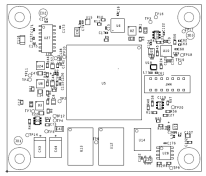
IO-LINK or WIRE

Signal Conditioner

Ethernet

Engine Monitor

Ethernet

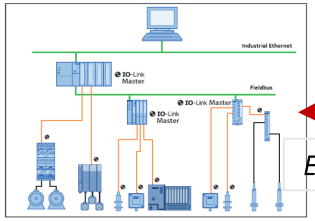


FPGA/SOC cards + SW

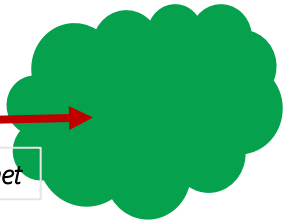
FPGA/SOC cards
Software Stack

Private or Public Cloud

Control Systems (DCS, PLC)



Ethernet



Gateays
Software Stack

Analytics Software

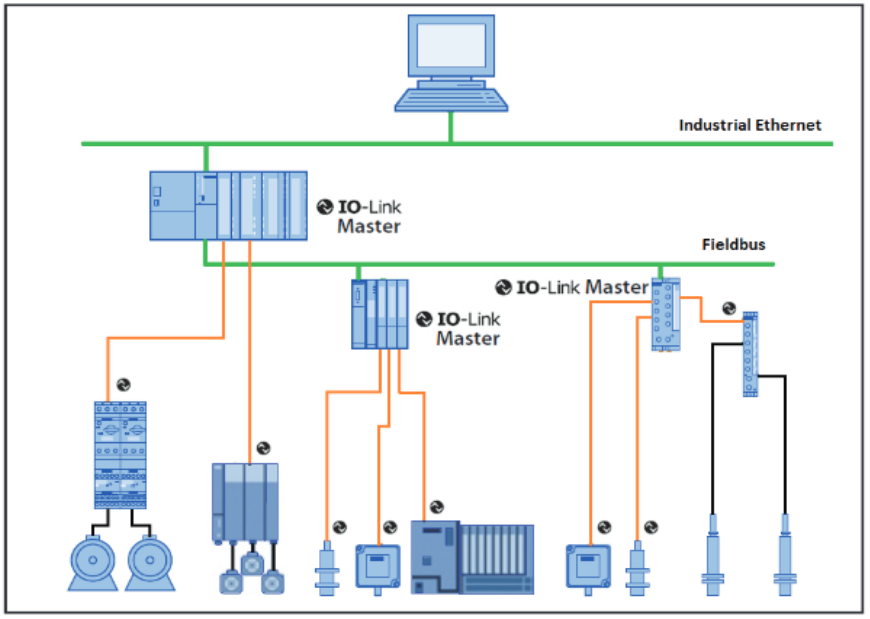
PHASE I
Focused on Rotating
Machinery $8B TAM

PHASE II
Complete Solution
For Industrial IoT

Rotating Machinery: Gas Turbines, Wind Turbines are first target

IoT and Analytics: Engine Monitor

Turbine



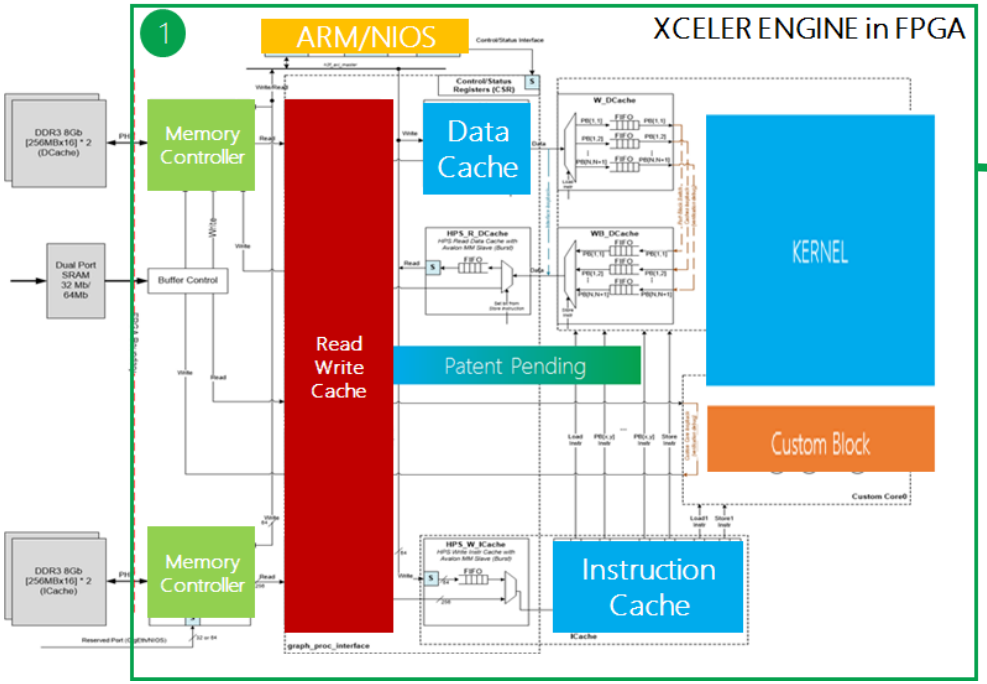
IO-LINK or WIRE

Fieldbus or HART

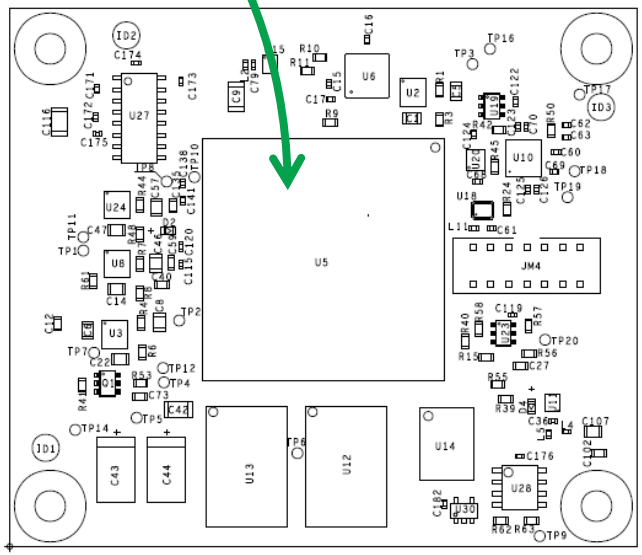
Industrial Ethernet

491 X1

Xceler Engine in FPGA/SoC

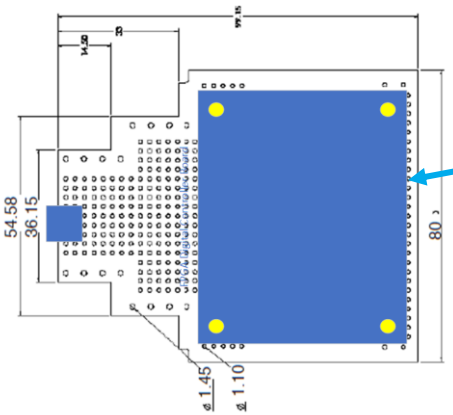


Working with Ectron Corporation In Developing Solutions

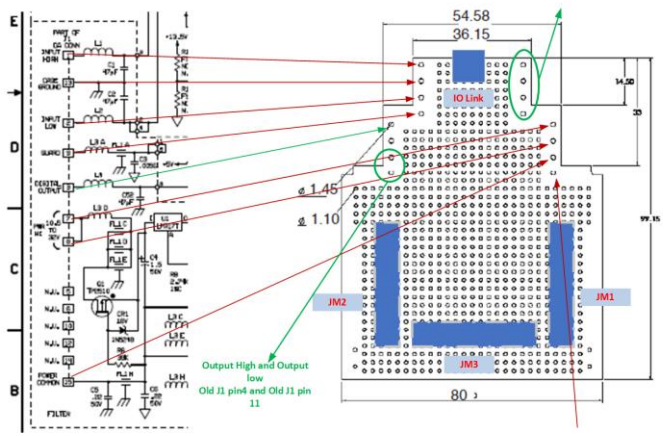


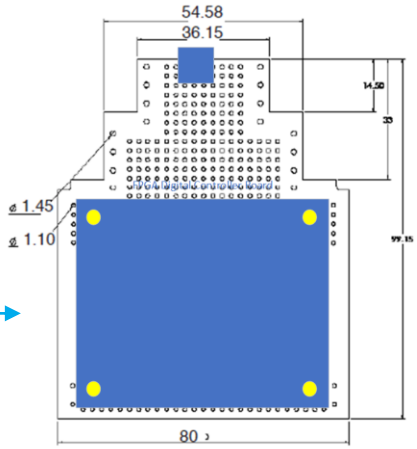
FPGA Control Module

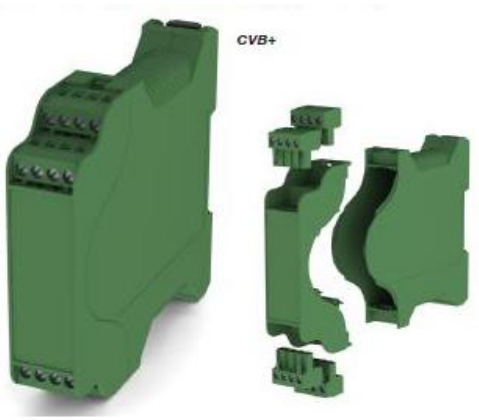
Mounted on Analog Front End for I/O Link Sensor Signal Conditioner



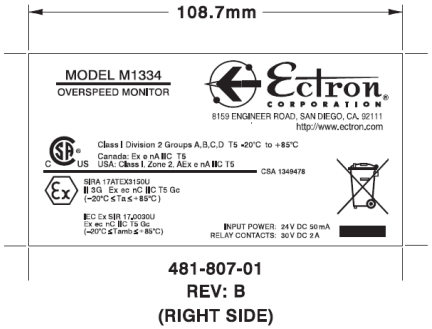
Product Q2 2018: Signal Conditioner







- Dual Core ARM 32-bit processor with machine learning co-processor + SW stack
- Millisecond response times for real time processing of data and Analytics
- Algorithms for clustering, filtering, outlier detection
- Mulitple Inputs, Digital outputs, Analog outputs
- Industrial Ethernet connectivity
- IO Link Connectors
- Power, Fault LEDs
- Continuous input range (1K Hz to 30 KHz)



Performance: Low power, Ability to Run ML and AI on Edge

Product Q2 2018: Engine Monitor

491x

IECX
SIRA

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-15 : 2010 Edition: 4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-7 : 2015 Edition: 5.0	Explosive atmospheres – Part 7: Equipment protection by increased safety "e"

- Dual Core ARM 32-bit processor with machine learning co-processor
- Millisecond response times for real time processing of data and shutdown
- Algorithms for clustering, K-Means (Nearest Neighbor) analysis, filtering, outlier detection
- Industrial Ethernet connectivity, PROFIBUS AND HART Protocol support
- IO Link Connectors
- Fieldbus interface and Optional GPS radio (in 491 X2 system with higher profile).
- Optional MIL-DTL-38999 Series III cylindrical connectors on 491 X2
- Power, Fault LEDs
- Programmable relay set points

Performance: Low power, Ability to Run ML and AI on Edge

IoT and Analytics: Engine Monitor

491 X1

Originally designed for gas turbine engines, the OSM (Overspeed Monitor) and the Industrial IoT solution can be applied to reciprocating engines and other mechanical systems as well. The unit provides the following additional capabilities over the old 491 A OSM with wireless connectivity, industrial ethernet or fieldbus connectivity and machine learning co-processing capability built in.

Processing and Connectivity

- Dual Core ARM 32-bit processor with machine learning co-processor
- Millisecond response times for real time processing of data and shutdown
- Algorithms for clustering, K-Means (Nearest Neighbor) analysis, filtering, outlier detection
- WiFi with noise immunity and Industrial Ethernet connectivity
- Optional GPS/GPRS radio (in 491 X2 system with higher profile). Optional Fieldbus interface
- Optional MIL-DTL-38999 Series III cylindrical connectors on 491 X2

Certifications and coatings

- CE and NEC
- CSA Class 1, Div 2 Groups A, B, C, and D
- ATEX Cat 3, Zone 2 hazardous area
- IP67 and IP69 certified design for dust and water ingress protection
- light gray polyurethane (FED-STD-595 color 36495)
- Aluminum Alloy - 6061, Temper-T6, EMI Gaskets

Operating Conditions

- Operating temperature: -40 to +85°C, 90% humidity non-condensing
- Power input requirements: 8-36 Vdc with high tolerance for noise and power variation

Performance specifications

- For shut down worst case 10 milliseconds
- Input frequency range (adjustable) from 100 Hz to 25 KHz for OSM
- Power output for active sensor for OSM
- Input Signals from sensors can be Sine, Square or Pulse
- Multiple Smart Sensor inputs (4 for X1 and 10 for X2) with IO-Link capability (IEC 61131-9)

Power: 8-36 Vdc with high tolerance for noise and power variation