

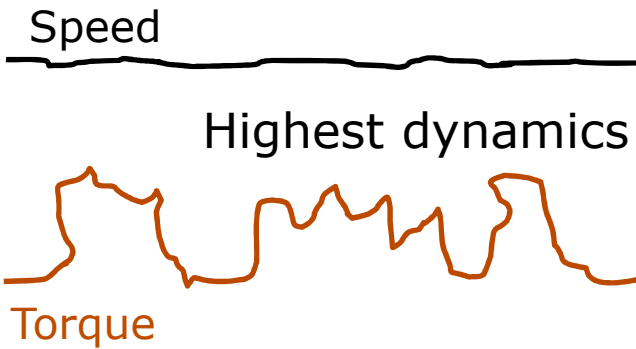


Drive your AC Brushless  
motor easily with **RX220**

Experiment – Calibrate – Integrate.

Renesas Electronics Europe  
ICBG  
Vincent Mignard  
January 2014      Rev. 2.00

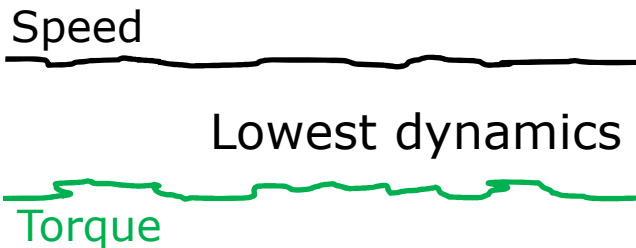
# Which target applications vs. requirements?



Highest MCU cost  
Low CPU load



Medium MCU cost  
Mid CPU load



Lowest MCU cost  
High CPU load



# Set of Motor control solution for your inverters



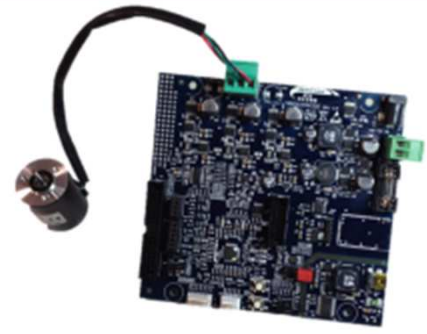
Highest dynamics



Highest MCU cost  
Low CPU load



Good dynamics



Medium MCU cost  
Mid CPU load



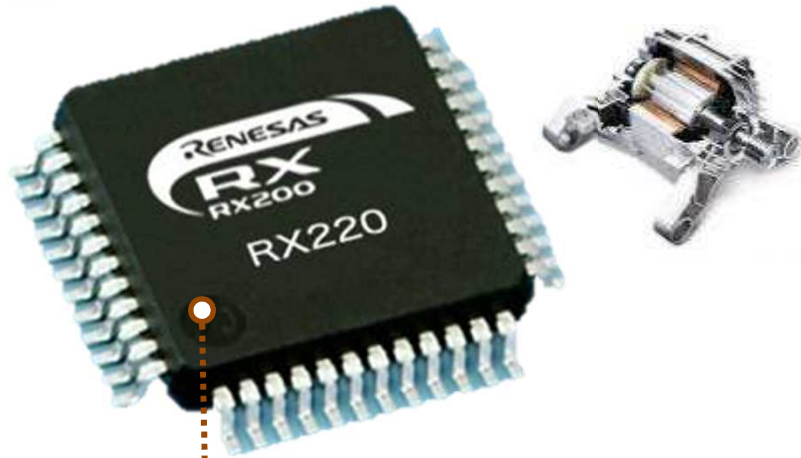
Lowest dynamics



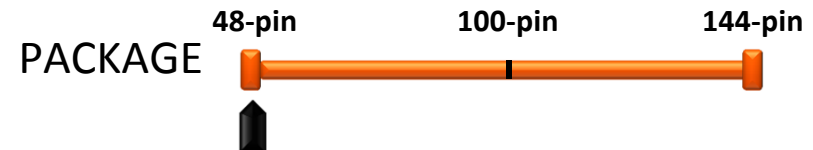
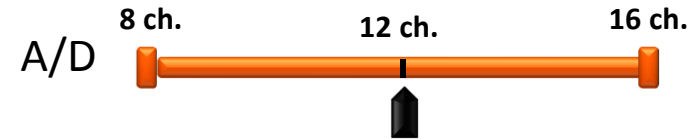
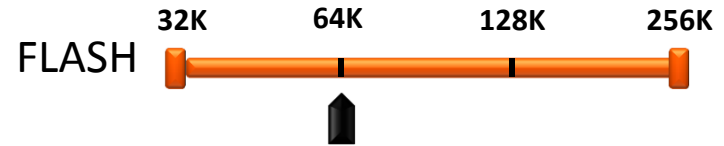
Lowest MCU cost  
High CPU load



# Why RX220 is a suitable MCU for inverter?



32-Bit MCU  
@ 32MHz  
8K Data Flash  
1.62 V to 5.5V



# RX220 MCU Benefits ?



50DMIPs with MAC enable complex vector control algorithm implementation

MC timer to drive one 3-phase motor, full h/w support of hall sensors, encoder

12-bit A/D with S/H on-chip single/three shunts sensorless algorithm

True 5V enabling high microcontroller noise immunity & robustness

h/w safety: CAC, POE, CRC, WDT, self-test A/D to comply IEC60730-1



# Which Ref. design did we build for you?

Vector control Algo.

3-phase AC  
Brushless  
motors

Auto-tuning  
Procedure of  
any PMAC motor

Sensorless  
control  
1 or 3 shunts

MOSFETs  
inverter

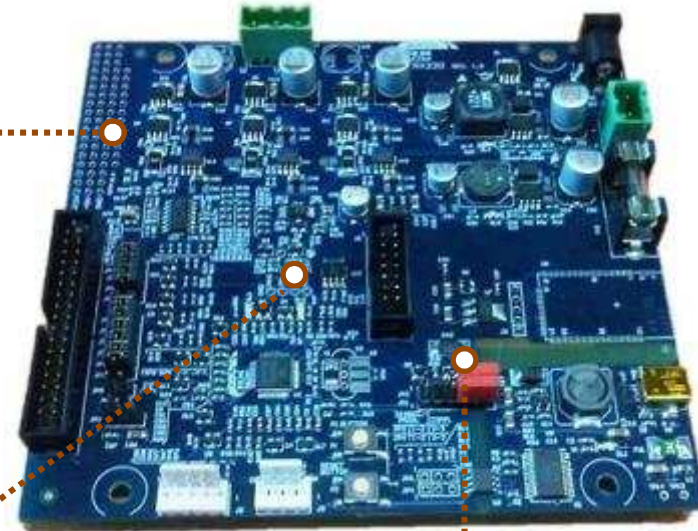
150W  
@ 48V

Ext. stage  
1.5KW  
@ 230V

USB  
powered

Prog/debug  
connector

Fully  
isolated



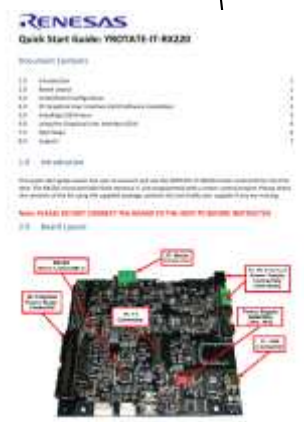
# What's inside the kit?



PC GUI s/w



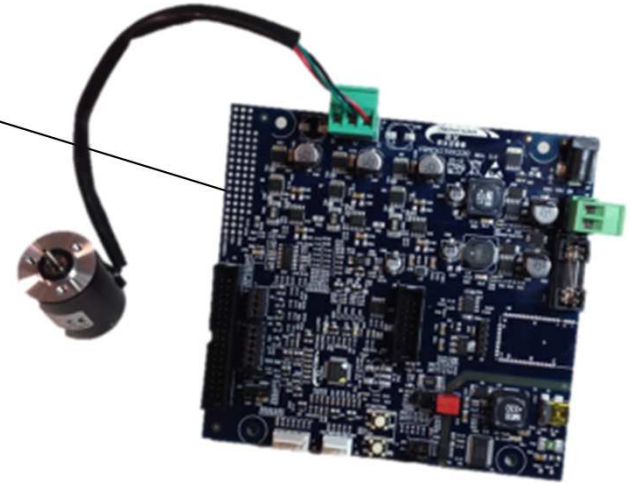
Schematics, Gerber, BOM Datasheets, User's Manual HEW Source code



Quick Start Guide



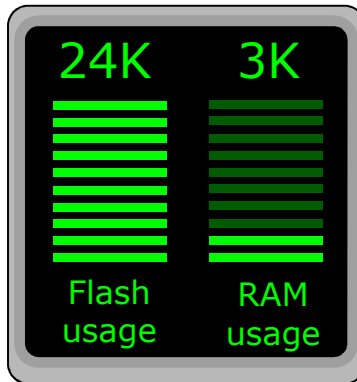
USB powered



Single PCB inverter based on RX220 + AC Brushless motor

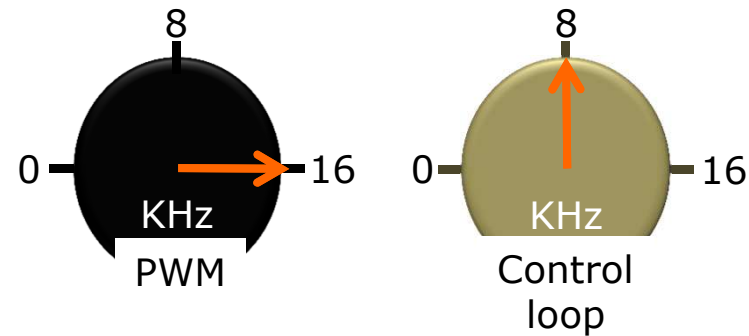
# What is doing the embedded software?

Small footprint

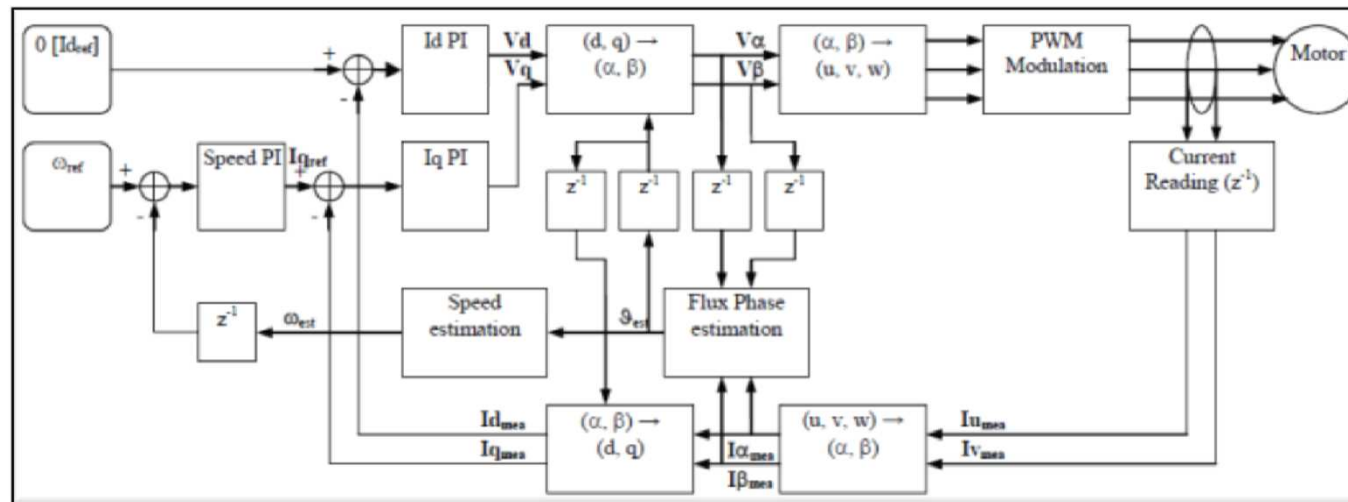


Good Dynamics

CPU load below 45% at 8KHz control loop



## Sensorless Field Oriented Control Algorithm





# Advanced PC GUI to speed-up evaluation



Custom motor calibration  
in a few mouse clicks

Alarms status  
displayed

Tuning of key parameters:  
PI coefficients, start-up, etc.

Real-time torques displayed

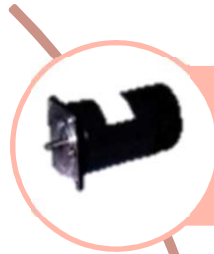
# Which benefits do you get from such kit?



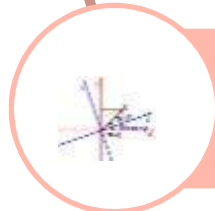
€149



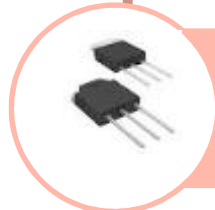
p/n: YROTATE-IT-RX220



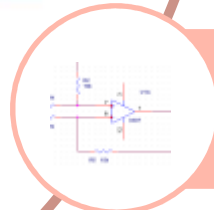
Calibrate & drive any 3-phase Brushless AC/DC motors thanks to the Auto-tuning procedure



Use royalty-free vector control s/w using small flash footprint and minimum CPU resources



5V MCU & MOSFETs on-board, 1.5KW external power stage ready to be connected



For only €149, it contains: Schematics, Gerber, BOM list, datasheets, User's Manual

# Feel free to evaluate the RX220 MC kit to reach:





Renesas Electronics Europe

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