YOUR POWER ELECTRONICS SUPPLIER
Our mission is to support designers of technological systems facing the most demanding constraints thanks to our core expertise in power electronics.

Benoit Schmitt
Founder & CEO
Created in 2008 by Benoit Schmitt and Raul Iglesias, Watt & Well is a power electronics supplier for the aerospace, electric mobility, and oil & gas markets. The company develops solutions combining the **know-how of new technologies, to the reliability of the product into harsh environments** (high temperature, vibrations, cosmic radiation).

Watt & Well has established itself as a reference in the world of power electronics with world-leading R&D centers projects.
ABOUT WATT & WELL

OUR TIMELINE

2008
CREATION

2013
PRODUCTION ACTIVITY

2015
ISO 9001

2017
INVEST IN PRODUCTION FACILITIES

2016
WATT & WELL USA OPENING

2016
WATT CONSULTING BECOMES WATT & WELL

2019
EN 9100
MEET THE LEADERS
CONVERTING POWER INTO CONFIDENCE

Benoît SCHMITT
CEO and Founder, O&G BU Director

Raul IGLESIAS
Co-Founder, Electric Mobility BU Director

Alain ROUAULT
USA Subsidiary CEO

Nicolas PACAULT
Aerospace BU Director

Cyril LE HENANFF
Quality Manager

Maël GUILBAUD
Chief Technical Officer
FOUR REASONS TO WORK TOGETHER
YOUR POWER ELECTRONICS SUPPLIER

1. EXPERTISE
Harsh environments, Motor Control, Power Supply, System Integration.

2. AGILE SOLUTION
Best-in-class products, Range from off-the-shelf to customized products.

3. MULTIMARKET EXPERIENCED
Watt & Well brings the best of its know-how in automotive and aerospace industries into your oil and gas applications.

4. RESULTS
Transparent tracking of the on-going processes, because at Watt & Well, we convert power into confidence.
Our mission is to provide power electronics equipment and to support their integration besides our customers. Our technology makes them suitable for increasingly harsh environments such as high temperature and vibration.

Benoît SCHMITT
CEO and Oil & Gas Business Unit Director
HARSH ENVIRONMENTS

Wide temperature range: -40 °C/°F to 200 °C (392 °F),
High shock level: up to 500 G

BEST-IN-CLASS TECHNOLOGIES

Wide Band Gap (SiC, GaN),
Code generation via Simulink for downhole automation,
EMC expertise for tool integration

CUSTOMIZATION & SEMI-CUSTOMIZATION

Off-the-shelf or tailor made products (footprint, power rating, extra-features...
PRODUCTS

NAR MOTION PRODUCTS
High temperature motor controller products portfolio

NAR POWER PRODUCTS
High temperature power supplies products portfolio

OIL & GAS APPLICATION

WIRELINE
High temperature, high power density, low diameter

DRILLING
High temperature, high shock level, high vibration level
Nar Motion is our innovative high-temperature motor controller series, providing optimal operation and high-reliability in harsh environments. Typical applications are downhole tools for oil & gas and geothermal markets.
Nar Motion
Products
Nar Motion XS

BENEFITS AT A GLANCE

Nar Motion XS is a complete motor control solution suited for one inch tool.

FEATURES

• Dimension (LxWxH): 130 x 20 x 12 mm (5.11 x 0.78 x 0.51 inches)
• Capability to drive DC brushless with hall sensor
• DC input range: 14 to 48 V
• Phase Current: up to 2 A_{RMS}
• Power drive capability up to 50 W at 150 °C (302 °F)
• Maximum operating temp: 175 °C (347 °F)
• Speed Variation capability by sending an analog signal between 0 V and 1 V
• Hall effect sensor configurable: 120° by default, 60° - available on demand

REFERENCE

• NM-20-48-2-HALL: Hall Effect Sensors
Nar Motion Products

Nar Motion S

**BENEFITS AT A GLANCE**

Nar Motion S is the cost effective version for low to medium power application, even without sensor.

**FEATURES**

- Dimension (LxWxH): 177 x 38 x 7.6 mm (6.96 x 1.49 x 0.27 inches)
- Capability to drive DC brushless motor with sensorless speed control
- Hall Effect Sensor compatibility
- Nominal DC input voltage: 24 V to 48 V
- Phase Current: up to $4 \ A_{RMS}$
- 100 W Typical Output power
- Maximum operating temp: 175 °C (347 °F)
- CAN bus Communication

**REFERENCE**

- **NM-38-48-4-SLES-S**: Sensorless Short Footprint
- **NM-38-48-4-HALL-S**: Hall Effect Short Footprint
- **NM-38-48-4-SLES-L**: Sensorless Legacy Footprint
- **NM-38-48-4-HALL-L**: Hall Effect Legacy Footprint
BENEFITS AT A GLANCE

Optimize your system by selecting our best-seller, Nar Motion M, that includes FOC and HV capabilities.

FEATURES

• Dimension (LxWxH): 292 x 40 x 24 mm (11.49 x 1.57 x 0.94 inches)
• High Temperature: up to 175 °C (347 °F)
• High Vibration: up to 20 G<sub>RMS</sub>
• Typical Power: 200 W to 1.5 kW
• Bus Voltage: 200 V to 600 V
• Phase Current: up to 6 A<sub>RMS</sub>
• Field Oriented Control for optimum system efficiency with PMSM motors
• Four-quadrant operation with independent speed, power and torque limits for easy motor paralleling
• Full digital control based on Simulink Model, and monitoring via CAN 2.0B bus
• Advanced system protection and monitoring
• Highly Configurable through an extensive Graphical User interface with logging capability

REFERENCE

• NM-40-600-6-RESO: Resolver sensor
• NM-40-600-6-HALL: Hall Effect sensor
• NM-40-600-6-SLES: Sensorless
Nar Motion Products

Nar Motion L

BENEFITS AT A GLANCE

Nar Motion L is a high-end motor controller that includes an internal low voltage power supplies which makes it the perfect match for an alternator active rectifiers for autonomous power generation downhole.

FEATURES

- Dimension (LxWxH): 400 x 40 x 30 mm (15.74 x 1.57 x 1.18 inches)
- DC input up to 600 V (survival 900 V)
- High power drives up to 5 kW continuous operation
- Maximum operating temp: 177 °C (350,6 °F)
- FOC including multiple real-time limits (Speed, Torque and Power) and 4-quadrant operation
- Isolated CAN bus communication

REFERENCE

- NM-40-600-10-RESO: Resolver sensor
- NM-40-600-10-HALL: Hall effect sensor
- NM-40-600-10-SLES: Sensorless
Nar Power Products
Small Boot Power Supply

BENEFITS AT A GLANCE

High temperature DC/DC power converter that can handle a wide voltage input range for regulated low voltage output. It is designed to provide steady low voltage output (12 V) from a high non-regulated voltage range (100 VDC to 400 VDC). Its performance and features make it a must-have for every system starting with a high voltage input.

FEATURES

• Non-isolated DC/DC converter
• DC input range: up to 400 V
• Regulated DC output of 12 V
• Operating temperature: up to 175 °C (347 °F)
• Output short circuit protection
• Input reverse polarity protection
• Common and differential mode filters

REFERENCE

• **NP-40-400-12-0.4**: 400 Vin, 12 VOUT, 0.42 A (IOUT)
BENEFITS AT A GLANCE

High voltage power supply with wide input voltage range (up to 1200 V) and settable output voltage. Typical uses include a local power supply (housekeeping) and boot power supply in downhole tools.

FEATURES

• DC input range: 350 V - 1200 V
• Output power capability up to 10 W
• Maximum operating temp: 175 °C (347 °F)
• Non-isolated output voltage
• Input OVLO UVLO
• Short circuit protection

REFERENCE

• NP-40-1200-24-0.42: 24 VOUT, 420 mA
• NP-40-1200-12-0.8: 12 VOUT, 800 mA
• NP-40-1200-5-1.2: 5 VOUT 1.2 A
Nar Power Products
200 W Step Down DCDC

BENEFITS AT A GLANCE

High temperature isolated step-down DC/DC power converter handling a wide voltage input range for regulated voltage output. It is designed to regulate from a 200 V - 900 V input supply a 48 V output voltage.

FEATURES

• Isolated power supply
• DC input range: 200 V – 600 V
• Output power: 200 W
• Maximum operating temp 175 °C (347 °F) (chassis temperature)
• UVLO/OVLO protection
• Over-current protection
• Thermal Shutdown at 190 °C (374 °F)

REFERENCE

• NP-38-600-48-2: 200-600 VIN, 48 VOUT, 2 A
• NP-38-600-24-4: 200-600 VIN, 24 VOUT, 4 A
• NP-38-600-48-4: 200-600 VIN, 48 VOUT, 4.1 A
• NP-38-600-24-8: 200-600 VIN, 24 VOUT, 8.2 A
Nar Power Products

2 kW Step Down DCDC

BENEFITS AT A GLANCE

This DC/DC power converter can handle a wide voltage input range for regulated voltage output. It offers performance, reliability, high efficiency and robustness.

FEATURES

• Non-isolated power supply
• DC input range: 400 V – 1100 V
• DC output: 600 V regulated
• Output power: Up to 2 kW
• Efficiency: Up to 98%
• Maximum operating temp: 180°C (356 °F)
• Input reverse polarity protection
• Short circuit protection
• UVLO and OVLO protection
• Thermal Shutdown

REFERENCE

• NP-60-1100-600-3.3: 680 mm long. OD 60 mm
**Nar Power Products**

**Nar Resolver to Digital Converter**

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**BENEFITS AT A GLANCE**

Complete tracking resolver-to-digital converter, including excitation generation and the full acquisition chain to a digital bus output. The system features a high bandwidth tracking algorithm that outputs angular position and rotor speed.

**FEATURES**

- Supply Voltage: 12 V to 32 V
- Consumption: 2 W
- Resolution: 12-bit
- Data: Absolute position and velocity outputs
- Error: System fault detection
- Optional Hall effect sensor emulation
- Operating ambient temperature: -40 °C (-40 °F) to 175 °C (347 °F) with short term operation up to 190 °C (374 °F)
- Programmable sine wave excitation (factory setting with default value 10 kHz)

**REFERENCE**

- NRDC-40-SPI: SPI Bus
- NRDC-40-CAN: CAN Bus
Nar Power Products
Nar MoDem

BENEFITS AT A GLANCE

Nar MoDem provides telemetry between downhole tools and Surface Equipment on any oilfield Services cables. It is optimized for applications on mono-cable (1N22 or 1N32 for example).

FEATURES

- Dimension (LxWxH): 200 x 38 x 25 mm (7.87 x 1.50 x 0.98 inches)
- Supply Voltage: 10-24 VDC
- Consumption: Low Power 3 W typical
- Wireline Distance: through 10 km of 1N32 cable
- High Cable Voltage: Up to 1 000 V
- Control: DSP & Analog electronic
- Operating ambient temperature: -40 °C (-40 °F) to +175 °C (347 °F)
- Vibration: 20 G_{RMS}
- Spare bus: SPI & RS485 HW ready Nar Health Monitoring ready HV Bus Monitoring

REFERENCE

- **NMDEM-38-10-CAN**: 10 kbit/s baud rate, CAN open Interface
Our mission is to support our North Americans’ customers seeking power electronics expertise, getting adapted resources allocation, including highly responsive skilled engineers, professionals on the customers premises with constant adaptation to their timeline. We deliver quality results.

Alain ROUAULT
Watt & Well USA Subsidiary CEO
ON-SITE SUPPORT

From A to Z and beyond, the engineering team is dedicated to the success of the project. They connect with the customers’ team and start delivering their core power electronics expertise for support.

LONG-TERM RELATIONSHIP INVESTMENT

We deliver satisfaction through our core expertise in power electronics. We build this satisfaction with our products and services but also with our way of keeping ourselves committed to the success of the customers project even beyond the delivery.
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LET’S TALK, REACH OUT TO US

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