UNITEL ENGINEERING PRODUCTS AND SOLUTIONS
FOR ELECTRICAL POWER UTILITIES

UNITEL ENGINEERING LLC

Russian company founded by experts in the area of utility telecommunications in 2009

The main company's goal is to design and produce robust equipment for mission-critical infrastructures

Today **UNITEL ENGINEERING LLC** is one of the leading equipment manufacturers providing reliable and secure complex solutions for transmission and distribution of electrical power

PKUS® Family provides fast, highly reliable and secure relay-protection channels for both command based and differential protection applications over dedicated optical fibers, communication networks and power lines.

- Digital Teleprotection Equipment

  - **PKUS SKO** – command transmission via dedicated optical fibers and communication networks

- Power Line Carrier (PLC) Teleprotection Equipment

  - **PKUS PLC** - command transmission over power lines

- Converters for interfacing protection equipment with IEEE C37.94 or optical E1 ports to communication networks using electrical E1

  - **PKUS EO1** - single-channel converter of optical C37.94 or optical E1 to electrical E1
  - **PKUS EO2** - two double-channel independent converters of optical C37.94 or optical E1 to electrical E1 with cross-connect functionality

- Compact design; Advanced technology; Digital signal processing; In-operation testing; User configurable; Simple operations

- Optical ports with SFP transceivers

- Integrated nonvolatile and not editable event recorder for command/alarm/ manipulation with 1 ms time stamps (Real Time Clock with an optional IRIG-B synchronization), COMTRADE file format support

- Diagnostic LEDs for Status and Alarms indication

- Link and Hardware Alarm contacts

- IEC 60870-5-101, IEC 60870-5-104, SNMP for SCADA

- High EMC immunity

- Complies with or exceeds the requirements of EMC Directive 2004/108/EC and Low-Voltage Directive 2006/95/EC

- Windows® compatible User Interface Program PKUSConverter for PKUS® Family Equipment
  - Configuration (on-line and off-line downloadable files)
  - Testing and Commissioning
  - Status and Alarm Monitoring

PKUS SKO complies with or exceeds the requirements according to IEC 60834-1 "Teleprotection Equipment of Power Systems - Performance and Testing – Part 1: Command Systems"
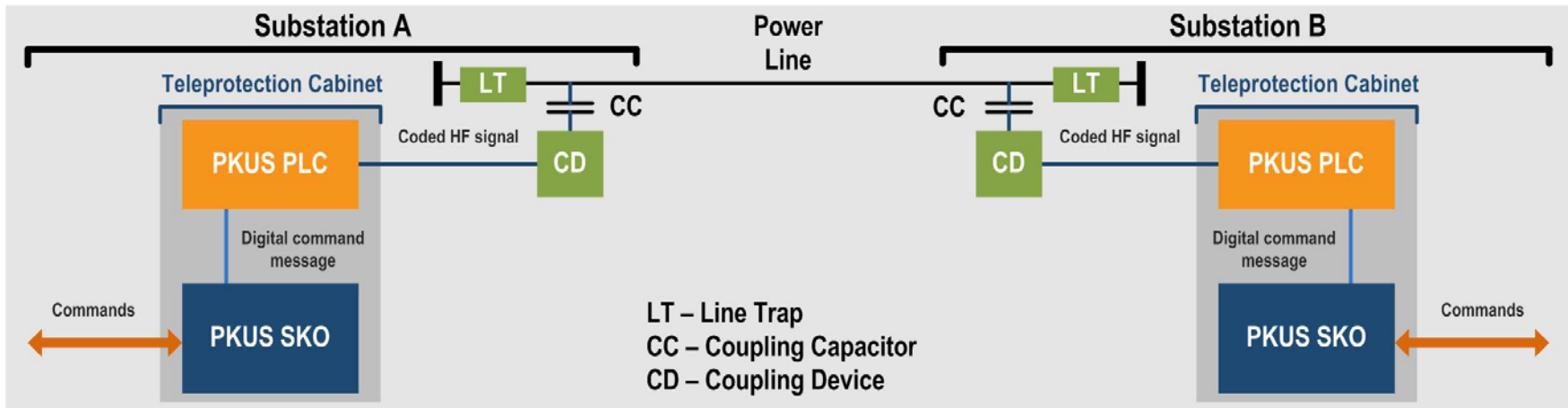

- Command via digital networks (transport and access multiplexers, IP/MPLS routers), radio links and dedicated optical fibers
- 16 independent commands
- 6 ms transmission time

- Dual line interface
- Point-to-point and point-to-multipoint applications
- Normal and Inverse T-operation for a protection of power lines with T-offs
- Seamless redundant 1+1 path protection with zero switchover time
- Addressing facility preventing unwanted operation due to accidental channel crossovers in communication networks
- 19-inch rack, 2 height units (2U) including 1U cable tray
- Dual (redundant) 48 VDC power supply with passive load sharing (optional primary power supply 110 VAC, 110 VDC, 230 VAC, 220 VDC)

PKUS PLC complies with or exceeds the requirements according to IEC 60834-1 "Teleprotection Equipment of Power Systems - Performance and Testing – Part 1: Command Systems" and IEC 60495 "Single Sideband Power-line Carrier Terminals"

- PKUS PLC combined with PKUS SKO provides simplex or duplex command transmission over overhead and cable power lines of 35 – 750 kV

- Frequency range – 24...1000 kHz

- Output power – 40 W

- Nominal bandwidth – 4 kHz

- 19-inch rack, 3 height units (3U)

Substation A — Power Line — Substation B

LT – Line Trap
CC – Coupling Capacitor
CD – Coupling Device

ENGINEERING
UNITEL

PKUS EO1

- Operating mode: C37.94/Electrical E1

- C37.94 Nx64 kbps (N=1…12)

- Compact case (198x115x50 mm), DIN-rail mounting

- Single 48 VDC power supply with two decoupled diode inputs (optional primary power supply 110 VAC, 110 VDC, 230 VAC, 220 VDC).

PKUS EO1

PKUS EO2

- Fully independent 2-channel converters

- Operating mode: C37.94/Electrical E1 (separately programmable for each channel)

- C37.94 Nx64 kbps (N=1…12)

- DS0 cross-connect functionality within each 2-channel converter

- 19-inch rack, 1 height unit (1U)

- Dual (redundant) 48 VDC power supply with passive load sharing (optional primary power supply 110 VAC, 110 VDC, 230 VAC, 220 VDC)

PKUS EO2

PKUS EO1 and PKUS EO2 are compatible with any relay protection equipment supporting C37.94.
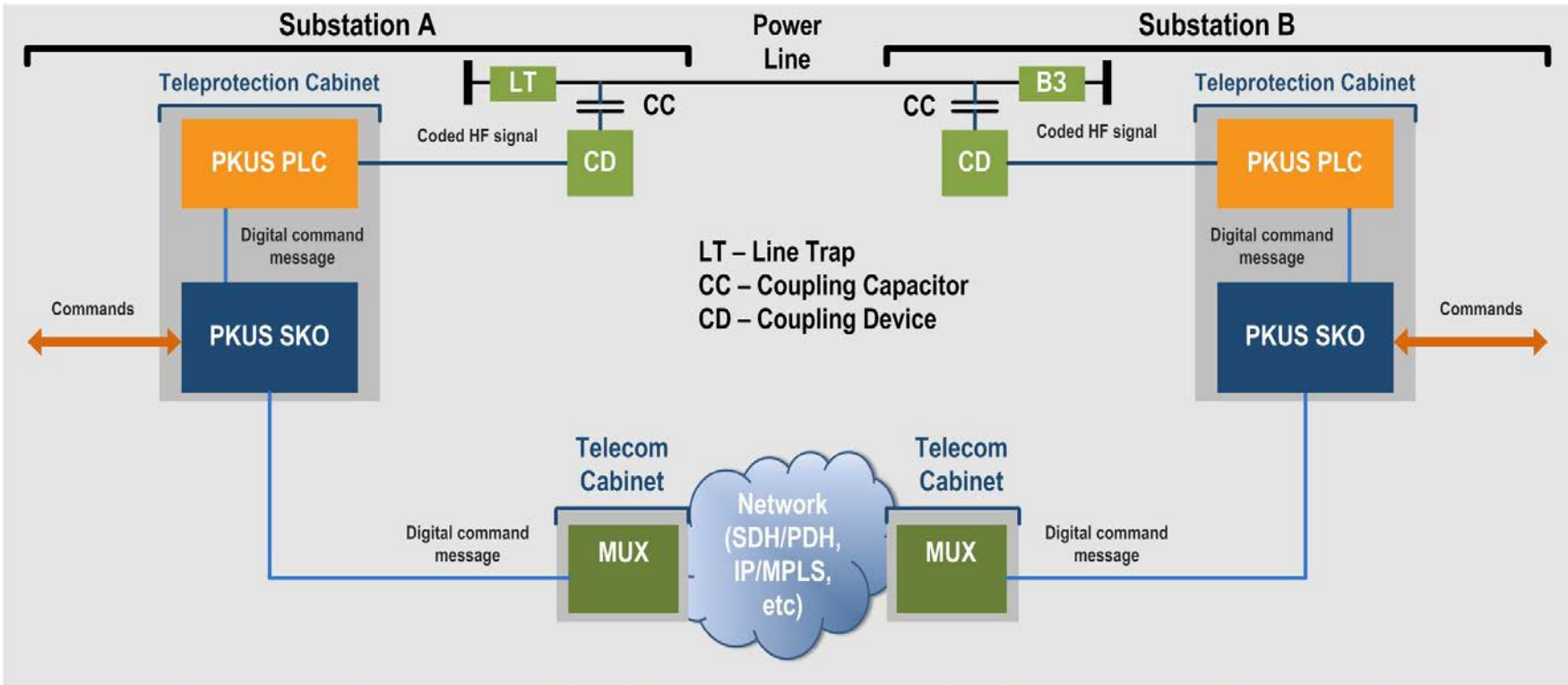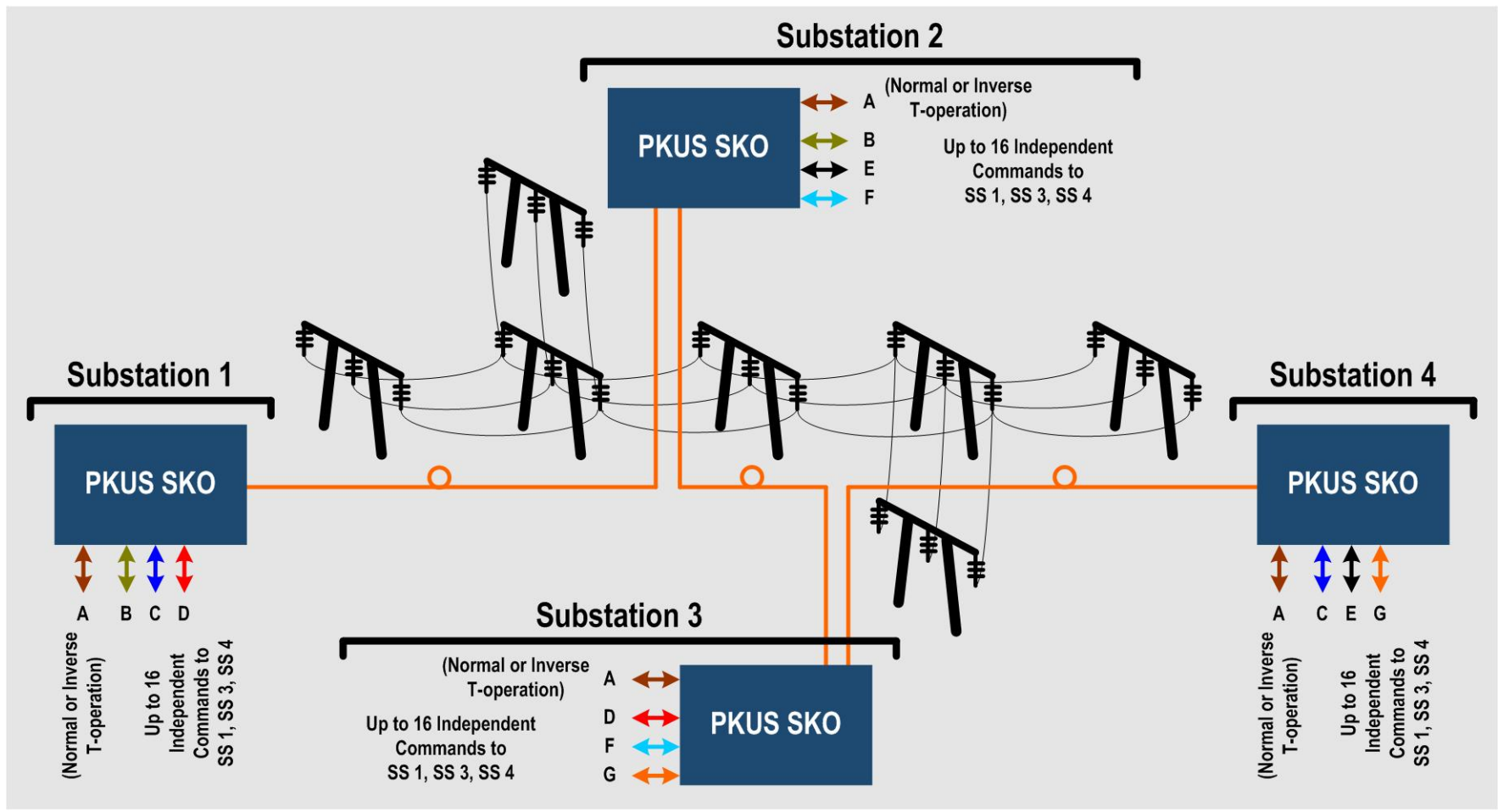
Commands are transmitted and received over overhead or cable power line and communication network (or dedicated optical fibers) in parallel.

Once a failure occurs to one path, the other remains operational.

Cost effective solution not requiring direct dedicated optical fibers between all substations.

Delay time of a command transit in power line T-offs is less than 1 ms.
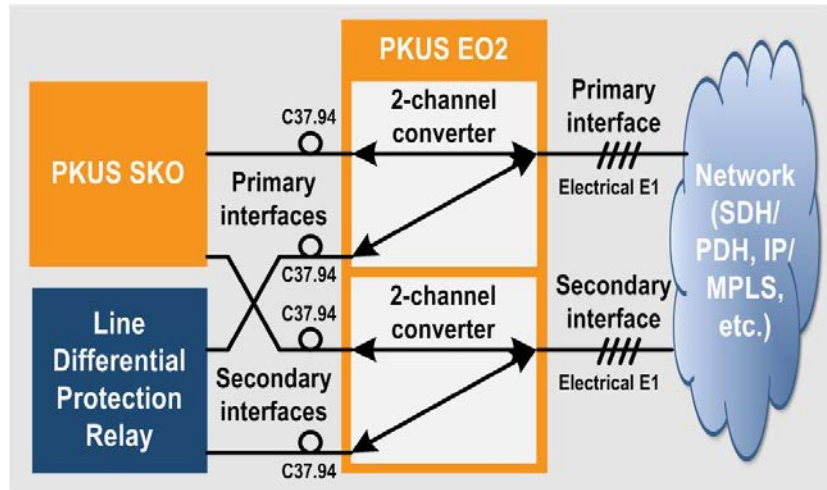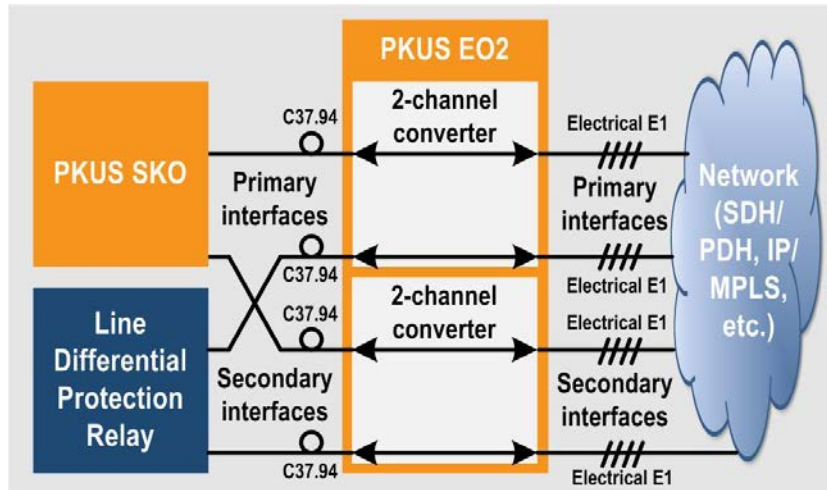
Interfacing PKUS SKO and Line Differential Protection Relay with C37.94 port to Communication Network

Interfacing PKUS SKO and Line Differential Protection Relay with C37.94 port to Communication Network using cross-connect functionality
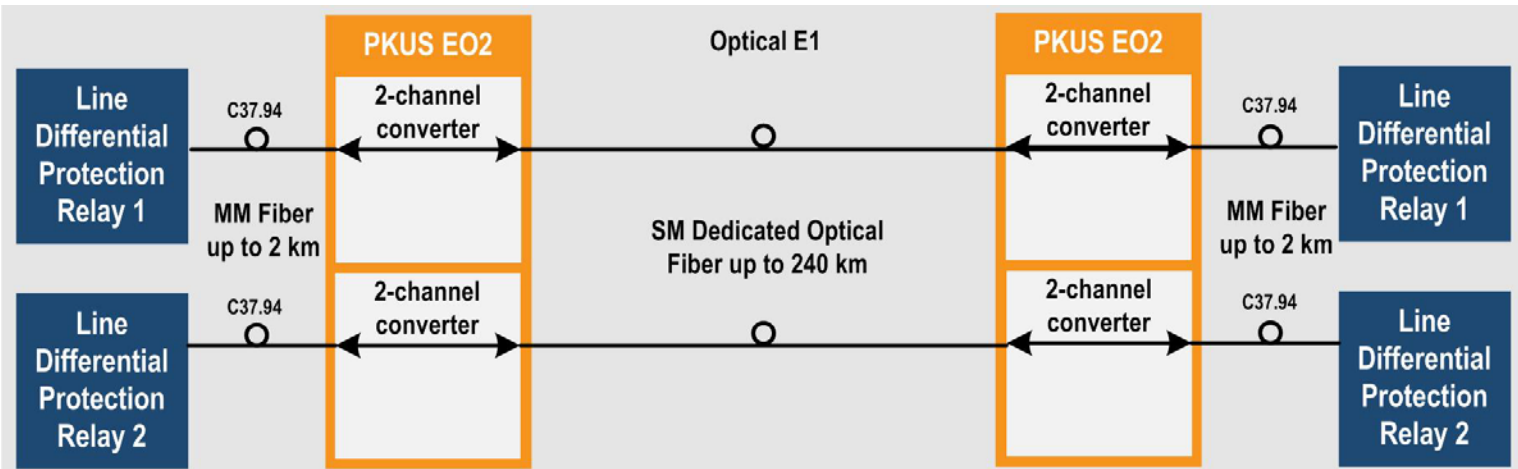
Interfacing two Line Differential Protection Relays with C37.94 port to two SM Dedicated Optical Fibers
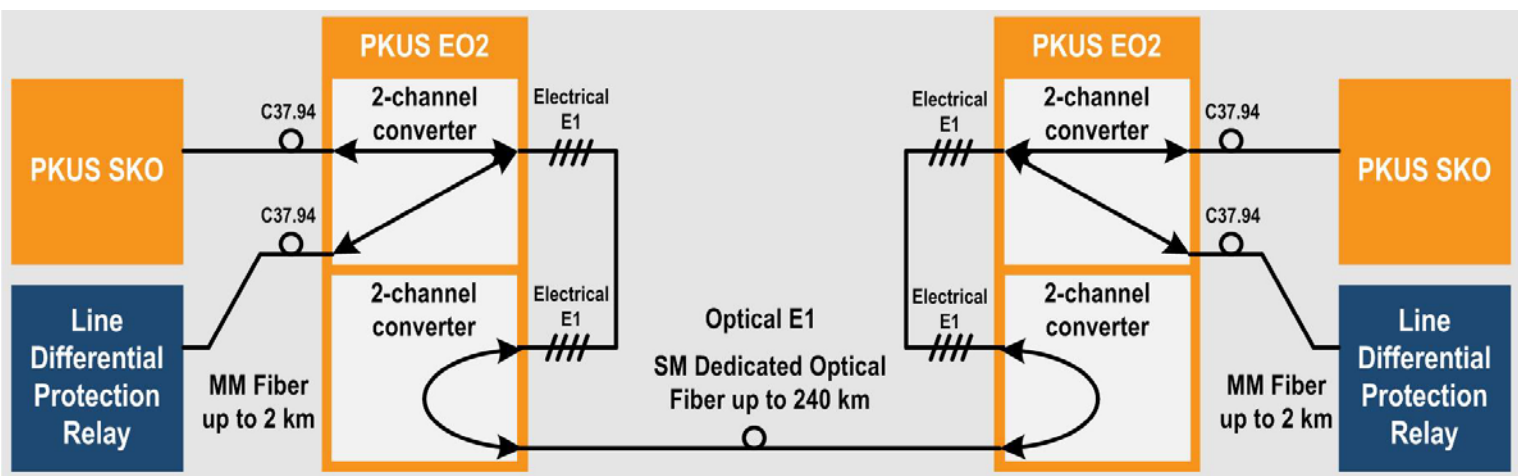
Interfacing PKUS SKO and Line Differential Protection Relay with C37.94 port to one SM Dedicated Optical Fiber using cross-connect functionality

WE ARE GLAD TO BE THE RELIABLE PARTNER FOR SOLVING YOUR TASKS!

THANK YOU FOR YOUR ATTENTION!

Office:
111024, Moscow, 2-nd Kabelnaya str. 2 ,bld.1
Phone: +7 (495) 651-99-98
E-mail: info@uni-eng.ru

Production:
111024, Moscow, 2-nd Kabelnaya str. 2 ,bld.1
Phone: +7 (495) 651-99-98
E-mail: info@uni-eng.ru