WOODWARD PRODUCTS FOR STEAM TURBINES

Veinfurt s.r.o.
Houškova 31,
32600 Plzeň
Česká republika
www.veinfurt.eu
**Mechanical Governors & Actuators**

- TM25 Hydro Mechanical Actuator
- VariStroke Actuator (Integrated)
- VariStroke Actuator (Remote Servo)
- VariStroke Servo

**Safety Systems**

- ProTechTPS Total Protection System
- ProTech-SX Protection System
- QuickTrip Trip Block Assembly

**Turbine actuation**

- CPCII Current to Pressure Converter
- MPU Magnetic Pickups

**Standard Configurable Controls**

- 505/505XT Single Extraction Turbine Control
- 505CC-2 Integrated Turbine & Compressor Control
- 5009FT Fault Tolerant Control

**Customized Turbine Controls**

- Flex 500
- MicroNet TMR Fault Tolerant Control
- GAP Fault Tolerant Control
- MicroNet -Plus Dual Redundant Control

**Integration**

- GAP Graphical Application Programmer

**Controls**

- Peak200 Mechanical Drive Speed Control
- ProTech -SX Protection System
**Safety Systems**
- SIL 3 & API From Sensor to Quick Trip

**Turbine Actuation**
- High Performance, High Reliability, Networkable

**Controls**
- Configurable & Automated Optimization

**Connectivity**
- System Network – Automated & Simple

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**Safe – Reliable – High Performance – Optimization - Simplification**
<table>
<thead>
<tr>
<th>Turbine Type</th>
<th>Application</th>
<th>Peak200</th>
<th>505D</th>
<th>505XT</th>
<th>Flex505</th>
<th>Flex500</th>
<th>505FT</th>
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<td>User Configurable</td>
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<td>User Configurable Simplex Hardware</td>
<td>User Configurable Triple Redundant Hardware</td>
<td>Custom Programmable Simplex Hardware</td>
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Main features
• Control:
  – Dual dynamic PID (Speed PID)
  – Adaptive Speed/Load PID dynamics
  – Cascade PID (turbine driven equipment pressure or flows)
• I/O:
  – DI 8x
  – AI 4x
  – Actuator output 1x
  – DO 4x
  – AO 3x
• Extension I/O:
  – 1x LinkNet HT AIO module (8 AI a 2 AO)
  – 1x LinkNet RTD module (8 temp signals)
  – 1x LinkNet HT DI module (16 BI)
  – 1x LinkNet HT DO module (16BO)

Communication:
• 2x Modbus TCP or UDP
• 1x RS-232 nebo RS-485
• 2x CAN (LinkNet modules)

Advantages:
• Field configurable
• Integrated control panel
• Easy configuration/installation
• Internal turbine simulator
• Adaptive PID controller
• Certified for hazardous locations

PEAK 200
Plant DCS

- Ethernet or Serial RS485
- 18-32 Vdc or 90-264 Vac
- Service Tool (Optional)

Peak200

- CAN Comm - Optional Config. I/O (Vib, Temp, Discrete, etc.)
- 4-20mA Process Controller Input
- 4-20mA or 0-200mA

Actuator

T&T Valve

Turbine Speed

Pump
Main Features

• Control or limiters:
  – Speed/Load PID (with multiple dynamic & adaptive PID)
  – “Auxiliary” PID 1 (limiter or control)
  – “Auxiliary” PID 2 (limiter)
  – Cascade PID (header pressure or Tie-Line Control)

• I/O:
  – DI 20x
  – AI 8x
  – Actuator output 2x
  – DO 8x
  – AO 6x

• Communication:
  – 4x Ethernet (Modbus TCP or OPC protocols)
  – 1x RS-232 or RS-485
  – 4x CAN

• Functionality:
  – Speed/Frequency Control
  – Turbine or Generator Load Control or Limiting
  – Turbine Inlet Header Pressure Control or Limiting
  – Turbine Exhaust Header Pressure Control or Limiting
  – Plant Import/Export Power Control or Limiting
  – Isochronous Load Sharing between units (with DSLC-II control)
  – Control of any process directly related to unit load

• Advantages:
  – Field configurable
  – Integrated operator control panel
  – Easy configuration/installation
  – Internal turbine simulator
  – Integrated first-out problem indicator
  – Certified for hazardous locations (low voltage models)
  – Automatic start routines
505 XT

**Main Features**

- Control or limiters:
  - Speed/Load PID (with multiple dynamic & adaptive PID)
  - Extraction/Admission pressure PID
  - „Auxiliary“ PID 1 (limiter or control)
  - „Auxiliary“ PID 2 (limiter)
  - Cascade PID (header pressure or Tie-Line Control)

- I/O:
  - DI 20x
  - AI 8x
  - Actuator output 2x
  - DO 8x
  - AO 6x

- Extension of I/O:
  - 2xLinkNet HT AIO module (8 AI and 2 AO)
  - 1x LinkNet RTD module (8 temperature)
  - 1x LinkNet HT DI module (16 BI)
  - 1x LinkNet HT DO module (16BO)

- Communication:
  - 4x Ethernet (Modbus TCP or OPC protocols)
  - 1x RS-232 or RS-485
  - 4x CAN

- Functionality:
  - Speed/Frequency Control
  - Turbine or Generator Load Control or Limiting
  - Turbine Inlet Header Pressure Control or Limiting
  - Turbine Exhaust Header Pressure Control or Limiting
  - Plant Import/Export Power Control or Limiting
  - Isochronous Load Sharing between units (with DSLC-II control)
  - Control of any process directly related to unit load

- Advantages:
  - Field configurable
  - Integrated operator control panel
  - Easy configuration/installation
  - Internal turbine simulator
  - Integrated first-out problem indicator
  - Certified for hazardous locations (low voltage models)
  - Automatic start routines
FLEX 500

Main Features

- Control:
  - Custom-programmed controller for:
    - Gas turbines
    - Steam turbines
    - Hydro turbines
    - Compressor control and protection
    - Gas and diesel engines
  - Programming via Woodward GAP

- I/O:
  - DI 20x
  - AI 8x
  - Actuator output 2x
  - DO 8x
  - AO 6x

- Extension of I/O:
  - unlimited

- Communication:
  - 4x Ethernet (Modbus TCP or OPC protocols)
  - 1x RS-232 or RS-485
  - 4x CAN

- Advantages:
  - Integrated operator control panel
  - Powerfull real-time microprocessor control for turbines&engines
  - Deterministic scan rates as fast as 5 ms
  - Distributed I/O capability
  - Compatible with RTCnet
  - Certified for hazardous locations
  - Low cost alternative to general PLC
ProTech SX
- One channel protection
- 10 additional inputs (7 x konfigurovatelných – AI/BI)
- 2x independent power supply
- 2x independent speed sensing
**ProTech TPS**
- Three channel protection
- Additionaly 30 inputs (10/channel)
- 2x independent power supply
- 3x independent speed sensing

**OCHRANY**

![Diagram of ProTech TPS and Turbine Control systems](image)