WOODWARD 9905-860 is a Peak 150 steam-turbine digital control with a 24 VDC supply, Modbus communications and a NEMA 4 enclosure. It controls a single valve or single-valve rack using magnetic-pickup speed feedback.

Selected identity

Part 9905-860	24 VDC Peak 150 with Modbus
Enclosure	NEMA 4; not the NEMA 4X part
Application	Single valve or single-valve rack steam turbine
Control feedback	Two magnetic-pickup inputs, high-signal-selected
Operator interface	LED speed display and keypad

System role

MPU inputs Measure turbine speed	**Peak 150** Compare reference and feedback	**Actuator** Command the steam valve

Steam-driven pumps

Govern speed on a configured single-valve steam-turbine mechanical drive with the matched actuator and pickup arrangement.

Fans and blowers

Use programmed start, idle/minimum and speed-reference behavior for the documented steam-turbine mechanical drive.

Compressor mechanical drives

Control turbine speed using local or remote reference and the configured magnetic-pickup feedback.

Remote control integration

Connect an engineered Modbus master or remote analog setpoint to the Peak 150 while preserving local, trip and operating-mode logic.

Control boundary

Keep an overspeed shutdown device totally independent of the prime-mover control. Review the programmed external-trip, front-panel-trip and control behavior under the plant procedure. A controller speed limit does not replace the independent shutdown function.

Speed calculation

Peak 150 regulates mechanical-drive steam turbines using a single valve or single-valve rack. The manual names pumps, fans, blowers and compressors. The controller counts pickup pulses and uses programmed tooth and ratio values to convert frequency into turbine speed.

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Supply and speed input

Exact Power Selection	24 VDC
Input Supply Range	18 to 32 VDC
Maximum Power Consumption	38 W
Magnetic Pickup Inputs	2; high-signal-selected
Minimum MPU Signal	1 Vrms
Minimum Detectable MPU Frequency	200 Hz at 1 Vrms
Maximum Detectable MPU Frequency	15 kHz
Maximum Control Speed	15000 rpm

Pickup feedback

Two identical magnetic-pickup inputs use high-signal selection. Each requires at least 1 Vrms; the documented detection range is 200 Hz at 1 Vrms to 15 kHz. The manual describes paralleling one pickup into both inputs when a single pickup is used. Retain separate pickup-circuit shielding and the configured gear data.

Analog and relay interfaces

Remote Speed Input	1; 4 to 20 mA or 1 to 5 VDC, jumper selectable
Remote Current-Input Load	250 ohm when 4 to 20 mA selected
Discrete Inputs	8; externally supplied 5 to 28 VDC or internal 24 VDC
Readout Analog Outputs	2; 4 to 20 mA or 0 to 1 mA, jumper selectable
Readout Maximum Load	600 ohm
Actuator Output Selection	4 to 20 mA or 0 to 200 mA; verify programming and jumpers
Actuator Driver Maximum Load	60 ohm at 0 to 200 mA; 450 ohm at 0 to 20 mA
Relay Outputs	4 hermetically sealed relays
DC Relay Contact Rating	2 A resistive at 28 VDC
AC Relay Contact Rating	0.3 A resistive at 115 VAC

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Precaution 1

Verify the complete 9905-860 identity as the 24 VDC, Modbus, NEMA 4 selection before connecting the supply.

Precaution 2

Use the documented 18 to 32 VDC supply range and check polarity; the control operates whenever power is applied.

Precaution 3

Program and review speed, start-mode, actuator and trip settings before allowing turbine operation.

Precaution 4

Verify the external trip input and retain an overspeed shutdown device independent of the prime-mover control.

Precaution 5

Shield each MPU and actuator circuit separately; connect the MPU shield at the control end only.

Precaution 6

Match internal analog-input and actuator jumpers to the installed signal ranges with the circuit isolated.

Precaution 7

Choose the correct RS-232, RS-422 or RS-485 terminal arrangement, transmission settings and unique slave address.

Precaution 8

Observe -25 to +60 deg C ambient operation and do not open the enclosure when a hazardous atmosphere is present.

Serial and environment

Serial Hardware Choices	RS-232, RS-422 or RS-485
Modbus Transmission Modes	ASCII or RTU; slave operation
RS-232 Link Distance	15 m maximum
RS-422 / RS-485 Link Distance	1200 m maximum
Modbus Slave Address	Default 01; configurable and unique on link
Multidrop Baud Limit	9600 baud or slower
Operating Ambient Temperature	-25 to +60 deg C
Storage Ambient Temperature	-40 to +85 deg C

Reference logic

Manual mode uses local speed commands; remote mode uses the enabled remote setpoint above minimum governor speed. A configured Modbus analog input can supply the remote setting. Combination mode selects the higher local or remote reference. Record the actual programmed mode before commissioning.

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9905-860

Which power and enclosure version is WOODWARD 9905-860?

It is the 24 VDC Peak 150 with Modbus and a NEMA 4 enclosure. The NEMA 4X equivalent uses part 9905-866; an ac/dc model is a different selection.

What MPU signal is required by WOODWARD 9905-860?

Each speed input needs at least 1 Vrms. The minimum detectable frequency is 200 Hz at 1 Vrms and the maximum is 15 kHz. Program the gear-tooth and gear-ratio values for the installed turbine.

How do two pickup inputs interact in WOODWARD 9905-860?

The control selects the highest input frequency as speed feedback. The manual describes connecting a single pickup in parallel to both inputs when only one is used, avoiding an unused-input alarm.

Can the remote input of WOODWARD 9905-860 accept either current or voltage?

Its internal jumper selects 4 to 20 mA or 1 to 5 VDC. In the current-input selection the input load is 250 ohm; confirm the installed jumper before applying a signal.

Are the readout outputs the actuator output on WOODWARD 9905-860?

They are separate circuits. Two readouts use 4 to 20 mA or 0 to 1 mA with up to 600 ohm load. The actuator has its own programmed current range and jumper selection.

Related WOODWARD catalog

WOODWARD 9907-186	Related control catalog; verify intended function
WOODWARD 8237-1246	Related control catalog; verify intended function
WOODWARD 8200-203	Related control catalog; verify intended function

Related catalog boundary

These links identify other WOODWARD catalog products for independent research. A common manufacturer does not establish a spare substitution, wiring compatibility or a supported system combination. Compare full function, part number, supply and interface before selection.

Configuration record

Installed display	Record five-digit or earlier four-digit revision
Remote reference	Record enabled analog or Modbus setting
Actuator configuration	Retain current-range jumper and program selection

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9905-860

Does WOODWARD 9905-860 initiate Modbus transactions?

It acts as a slave and replies to a master request. Select ASCII or RTU and the correct serial hardware, give each slave a unique address, and use 9600 baud or slower for multidropping.

What contact load can WOODWARD 9905-860 switch directly?

The relay contacts are rated 2 A resistive at 28 VDC or 0.3 A resistive at 115 VAC. Use an interposing relay if the required current exceeds the stated rating.

Is WOODWARD 9905-860 sufficient as the only overspeed shutdown device?

The prime mover requires an overspeed shutdown device totally independent of its control system. Retain that protection and verify programmed control and trip behavior before turbine operation.

Related WOODWARD catalog

WOODWARD 8280-192	Related control catalog; verify intended function
WOODWARD 9905-003	Related control catalog; verify intended function
WOODWARD 9905-096	Related control catalog; verify intended function

Acceptance record

Identity	9905-860; 24 VDC; Modbus; NEMA 4
Speed feedback	Pickup voltage, frequency, gear data and both input states
Actuator	Range, jumper, load and controlled stroke direction
Protection	External trip and independent overspeed shutdown
Reference mode	Local, remote or configured combination
Serial link	Hardware, transmission, baud and unique address

Manufacturer reference map

Woodward manual 85565 Rev. E: part selection printed p. 9 (PDF p. 19); wiring pp. 9-15 (PDF pp. 19-25); function pp. 16-24; programming pp. 38-55; Modbus pp. 87-96; specifications pp. 119-120 (PDF pp. 129-130). Follow the complete equipment instructions and retain the configured machine settings.

Relay logic context

Trip relay	Programmed energize or de-energize for trip
Alarm relay	De-energizes for alarm
Two configurable relays	Check the programmed application function

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