WOODWARD 9905-860

01 / EXACT CONTROL SELECTION

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.

Identify the ordered control

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

Closed-loop role

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

Steam-turbine scope

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.

Supply selection

9905-860 selects the 24 VDC version. Its documented range is 18 to 32 VDC and maximum consumption is 38 W. There is no power switch: the unit operates whenever power is applied. Do not apply the ac/dc version’s supply values to this part.

Related WOODWARD catalog

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

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Input and feedback data

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
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, actuator and relays

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

Output ranges are distinct

The two analog readouts, actuator output and relay contacts perform different functions. Confirm current-range jumpers and programming separately. Readout loading does not establish the actuator-driver load capacity.

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Serial interface and operating limits

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
Operator Speed Display	Five-digit LED; identify installed display revision
Operating Ambient Temperature	-25 to +60 deg C
Storage Ambient Temperature	-40 to +85 deg C

Master and slave roles

Select RS-232, RS-422 or RS-485 and ASCII or RTU to match the master. The controller acts as a slave. RS-232 is limited to 15 m; differential RS-422 and RS-485 permit the specified 1200 m link. Verify signal ground, end-only shields and network termination against the applicable wiring figure.

Configured references

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.

Shield arrangement

Use separate shields for each magnetic pickup and actuator circuit. Separate shielding is also recommended for each mA input; contact inputs may share an overall-shielded multicore cable. Connect shields at the Peak 150 end only under the documented wiring arrangement.

Address and network

The default slave address is 01 and is configurable. Every slave on a link needs a unique address. For multidropping, use 9600 baud or slower and the documented differential wiring and termination.

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Speed feedback behavior

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.

Commissioning evidence

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

Protection 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.

Actuator and relays

Review the selected actuator current, internal jumpers and configured output before stroking. The trip relay can be programmed to energize or de-energize for trip; the alarm relay de-energizes on alarm. Two additional relays are configurable.

Ambient and revision

The operating ambient is -25 to +60 deg C; storage is -40 to +85 deg C. The manual primarily covers the five-digit display version and notes differences in older four-digit versions. Retain the installed revision with the application record.

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.

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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.

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.

Related WOODWARD catalog

WOODWARD 8200-203	Related control catalog; verify intended function
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

Catalog selection

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.

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.

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