

NEOS TECHNOLOGIES

A Gooch & Housego Company

OPERATING MANUAL

**POLYCHROMATIC ACOUSTO-OPTIC MODULATOR
EIGHT CHANNEL RF DRIVER**

FOR THE **48058** PCAOM

MODEL NUMBER:

64048-80-.1-8CH-16

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SECTION I
INSPECTION PROCEDURE

Examine the shipping carton for damage. If the shipping carton or packing material is damaged it should be kept for the carrier's inspection. Check the contents of the shipment for completeness, mechanical damage, and then test the equipment electronically. Operating procedures are contained in Section VI. Notify the carrier and NEOS Technologies. If the contents are incomplete, or the equipment does not pass the electrical testing please notify NEOS Technologies.

If there is any problem with the use of this equipment, or if the equipment fails to function as expected contact NEOS Technologies, do not try to trouble shoot or repair this equipment. Consult with a NEOS service engineer. If the equipment needs repair

SECTION II DESCRIPTION

The 64048-80-.1-8CH-16 PCAOM driver is designed to generate the precise RF frequency needed to select each of the laser wavelengths out of the light spectrum of a multi-wavelength laser with the driver having eight channels. This allows independent selection and modulation of up to eight wavelengths at the same time. Each channel has 16 preset wavelengths to choose from. These wavelengths are factory set to cover all the common laser wavelengths in the visible spectrum. If requested NEOS will set the wavelengths as specified on a custom basis. The driver generates each RF signal by indirect synthesis.

To change the wavelength selection for any or all channels, dial in the new wavelength and press the reset button. Each channel has an 8 KHz / step, fine tuning control to accommodate for any variations in the PCAOM. Once the PCAOM Bragg angle is set for one wavelength, this angle adjustment should not be touched again. If the PCAOM efficiency at a different wavelength is not peaked as high as it should be then dial the fine tune control on the driver and press the reset button. The output power (factory set) can be easily adjusted to set the diffraction efficiency to maximum. Each channel has an easy to access trimpot with a range adjustment of 50 to 200 mW.

There are two ports for modulation input: a differential AM analog port and a TTL blanking port. The analog port is 0 to 5 volts and can be either single ended or differential. The differential mode is used to cancel common mode noise. To use the input in the single ended mode, either ground the minus input and apply a positive signal to the plus input or ground the plus input and apply a negative signal to the minus input. Input impedance is high enough (10K Ω) so that the driver can be easily driven from existing pc boards (refer to figure 2). The analog modulation has a RF extinction ratio of > 60db. The TTL modulation extinction ratio is also > 60dB. The rise / fall time of the driver is 500 nanoseconds. For a 2.0 mm beam in the PCAOM the system will support a modulation rate greater than 100 kHz.

The output sample port (TP1) provides a -20 dBc sample of the actual output frequency. The pin-outs for the D connector are silk screened on the housing (Refer to figure 3 for pin outs). The system has a set of eight push button-CW/Normal switches, one for each of the eight wavelengths, to allow for testing when a computer or other modulating source is not available.

SECTION III
SPECIFICATIONS

<u>PARAMETER</u>	<u>SPECIFICATION</u>
Number of Channels	Eight
Frequency Stability	$\pm .01\%$
Power Out	50-200 mW
Wavelengths per Channel	16
Fine Tuning Range	+ 56 kHz, - 64 kHz in 8 kHz Steps
Analog Inputs (8)	0-5 volts into 10 k Ω
Blanking Inputs (8)	TTL, 4.7K Ω pull-ups. No input or HIGH is not blanked.
Rise/Fall Time	500 ns Max
Extinction Ratio	Analog > 60 dB TTL > 60 dB
Power	100-240 VAC, 50-60Hz, 1.5A Maximum
Connectors:	
RF out:	BNC Female (mates with Amphenol P/N 69475)
Data in:	25 Pin D-Sub Female (mates with Panduit P/N IDM25PH5)
TP1(-20dBc)	SMB Male (mates with ITT Cannon P/N B51-007-0000-220)
Outline Drawing:	53D3423

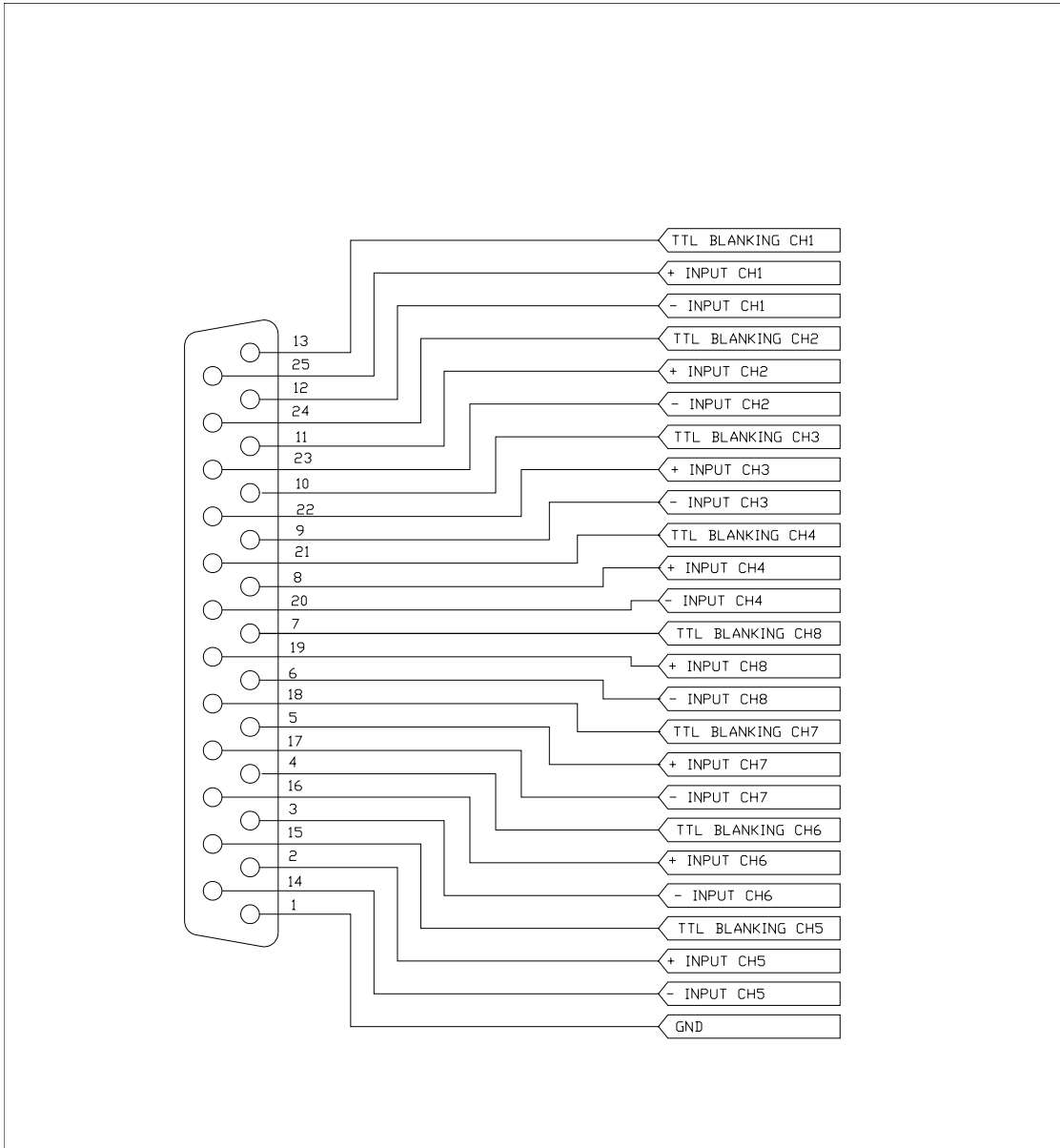


figure 1
 J1 PINOUT
 FEMALE DB 25

45A8212

SECTION V
CONTROLS AND CONNECTIONS

B. Front Panel Controls:

Push Buttons (F1-F8) – Turn on the selected wavelength, disables computer input.

INT Push Button selects the blanking mode:

- A. Internal – When the AM signal is less than approximately 150 mV the blanking is automatically engaged. The external blanking is disabled.
- B. External – A TTL low (< 0.3V) on the blanking input blanks the selected wavelength.

B. Inputs/Outputs: **J1** See figure 1

Blanking Modulation Input – This input accepts TTL level signals and modulates the carrier. When a TTL “1” or high is input to this port there is no blanking for the selected wavelength. When a TTL low “0” is input the selected wavelength is blanked.

AM Input – 0 to 5 Volts differential input with 10K Ω input impedance. To use this input single ended ground one side “+” or “-” and apply the proper signal to other side.

TP1 – SMB Male – Provides a -20 dBc sample of the actual output frequency

RF OUTPUT – BNC female connector – Combined RF output of all eight channels.

C. Internal Controls on module:

Wavelength select (X8) – a 16 position switch. See list next page.

Fine Frequency Adjustment (X8) – a 16 position switch. + 56 kHz to - 64 kHz in 8 kHz Steps

Reset Button – Resets the synthesizer to the new selected frequency.

Output RF power adjustment (X8)

Note: The total RF power combined from all eight channels should not exceed 1.6 Watts CW.

SWITCH SETTINGS VS. WAVELENGTH FOR EACH CHANNEL
STANDARD WAVELENGTHS

(λ) SWITCH POSITION	WAVELENGTH nm	Frequency MHz
0	676*	49.05
1	647*	51.72
2	632	53.20
3	575	59.82
4	568*	60.76
5	530	66.50
6	528	66.84
7	520*	68.23
8	514*	69.36
9	501	71.85
A	496	72.67
B	488*	74.74
C	476*	76.40
D	472	78.36
E	465	80.10
F	457*	82.21

* Standard NEOS Factory settings

Note: Fine frequency adjustment is + 56 KHz to - 64 KHz in 8 KHz Steps from those frequencies listed.



SECTION VI

OPERATING PROCEDURE

Testing Procedure:

1. Before applying power, connect the RF output to a load capable of dissipating 1 watt or connect to a PCAOM.
2. Apply 100-240 VAC to the back panel and turn on the power switch.
3. Input proper modulation signal into driver or push the proper button on the front panel, then measure power and frequency for each channel or measure light for each wavelength and diffraction efficiency.
4. The unit is operating if 50 to 200 mW are output at the correct frequency from each channel. See the acceptance test report for this unit for frequency for each channel.

Operating Procedure:

1. Apply 100-240VAC to the back panel and turn on the power switch.
2. Input proper modulation signal into driver or push the proper button on the front panel so as to select the 488 nm wavelength.
3. Align the **48058** PCAOM to the laser beam (Vertical Polarization Required) and adjust the Bragg angle to output maximum diffraction efficiency into the - First order beam (toward the connector).
4. Deselect the 488 nm wavelength.
5. Without readjusting the Bragg angle, select each of the seven other wavelengths, one at a time, and adjust the fine frequency adjustment for that wavelength, pressing the reset button each time for each position of the fine frequency adjustment switch.
6. Adjust the power adjustment for each wavelength for maximum diffraction efficiency.
7. Apply the appropriate control signals to select the desired wavelengths and effects.

Wavelength Change:

Each channel has 16 preset wavelengths to choose from. The desired wavelength can be selected by changing (λ) switch to the desired wavelength and pushing the reset button. The fine tuning of the frequency is accomplished by adjusting the fine tune switch and pushing reset button.

NOTE: Never have two channels tuned to the same wavelength.