OPERATION MANUAL

MODEL QMP-W00000
MOTORIZED PROGRAMMABLE PHASE SHIFTER

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MANUFACTURED BY

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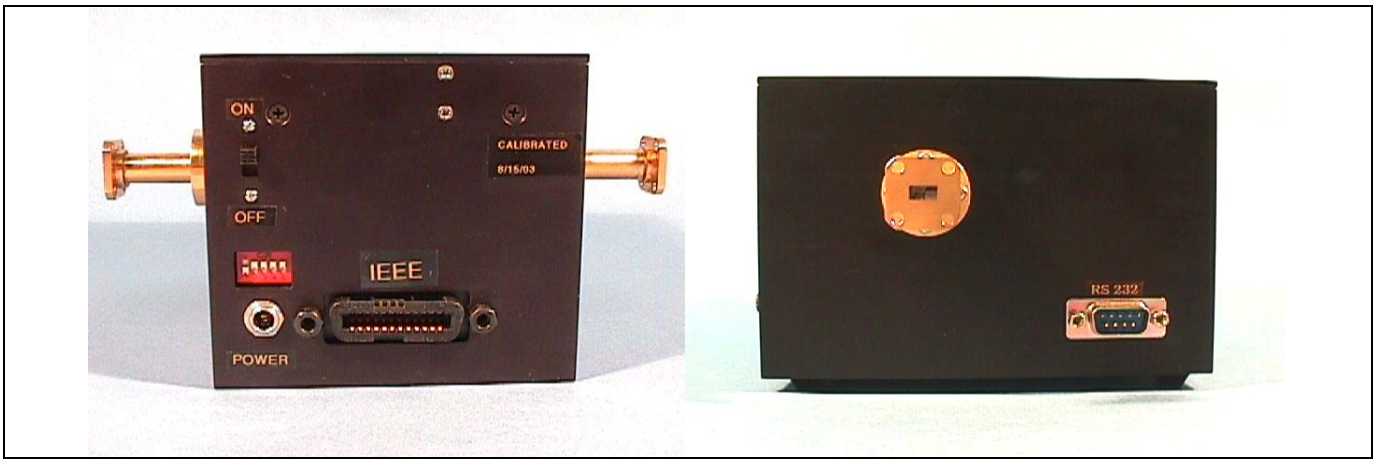
The QuinStar QMP-W00000 model is a motorized programmable phase shifter for use in millimeter wave systems. It is available in most standard frequency bands. This model is versatile for it can be used manually or through remote programming. Phase shift amounts are clearly displayed through a digital display.

To accommodate remote programming operations the QMP-W00000 model provides an IEEE-488 (parallel) interface or a RS232 (serial) port. For local adjustments there is a rocker switch located right next to the digital display on the front of the unit. This switch can also be disabled or locked to prevent tampering or inadvertent adjustments while in remote use. Phase shift amounts can be adjusted remotely or manually from the range of 0 to 360 degrees. Phase shift increments are 0.5 degrees.

The motor controller and interface circuits are custom designed and uniquely packaged within the durable phase shifter housing. The custom microprocessor based electronics ramp the speed of a precision stepper motor to insure fast accurate positioning.



Rear and Side Views of Typical Unit

INSTRUCTIONS FOR OPERATION

1.O POWER REQUIREMENTS

The QMP-W00000 model requires a single DC input of +24 VDC, 500 mA from regulated source, which can be applied through the 2.5mm connector on the back panel.

2.0 START UP

To start up the unit apply the DC input voltage and turn the power switch to the ON position. The default phase shift amount is 0 degrees. This provides a fail-safe setting when units are initially powered up.

Resetting the unit is accomplished by turning the power switch OFF and then back to the ON position or by removing and then reapplying the DC input power.

2.1 LOCAL OPERATION

When initially turned on, the unit is ready for local operation. The INC/DEC rocker switch located next to the digital display on the front of the unit is used to increment and decrement the phase shift amount. Holding the INC/DEC switch in either direction for more than four seconds causes an increase in the motor speed thus allowing faster phase shift changes. The phase shift amount does not change until the switch is released at the desired setting.

Upon turning the unit on, an audible sound generated by the stepper motor is present. This low frequency growl is a normal resonant sound produced by the stepper motor at certain positions or speeds and it is not an indication of an unhealthy condition. The sound is most notable when approaching the lowest phase shift amount. The lower motor speeds are needed to synchronize the motor with the digital readout and provide easier manual adjustments.

3.0 REMOTE MODE

The remote mode is accessed and controlled through either the IEEE-488 (parallel) or RS232 (serial) port.

The phase shifter is capable of responding to the following commands:

1: Basic Listener
2: Device Clear
3: Remote Enable
4: Go to Local
5: Local Lockout
6: Serial Poll
7: Interface Clear
8: Read back phase shift amount

The Instruments on the bus are assigned unique addresses. At QuinStar the addresses of the QMP-W00000 models are set to 17. Address change is accomplished by setting the BCD switch located on the rear panel to the desired binary number. Reset the unit by turning the power off and then on again.

GPIB I/O

Command Set:
nn.nn = move to a given phase shift value
R = Reset
I = Report identification string for unit
S = Report value of serial poll byte
G = Report value of phase shift

The GPIB address is determined by the address switch settings upon power-on. Input command messages should be terminated by the GPIB EOI signal and may have trailing carriage-return (ASSCII 13) or linefeed (ASCII 10) characters.

Serial Poll Bit Values:

Bit	Definition
7	Unit is busy
6	Unit request service (not busy)
5	(reserved)
4	Message ready for transmit from unit
3	Transmit error detected
2	Receive buffer overflow
1	(reserved)
0	Command error in received message

The serial poll busy bit (#7) should be read and verified as clear before each input command message is sent to the unit. The message ready bit (#4) will be set when the unit has a message ready to be transmitted to the host. The command error bit (#0) will be set after an error is detected in a command message received by the unit.

NOTE: BEFORE THE PHASE SHIFTER WILL ACCEPT IEEE COMMANDS, A CLEAR FUNCTION HAS TO BE PERFORMED ON THE BUS.

The unit will respond the GPIB Device Clear command by executing a “Reset” command (moving to 0 degrees). The unit will respond to the GPIB Local-Lockout state by disabling the step-phase shift switches. The unit will respond to the GPIB Go-To-Local command by enabling the step-phase shift.

SERIAL PORT I/O (optional)

The serial port baud rate is fixed at 9600 with no parity, eight data bits and one stop bit. Input command messages should be, terminated by a carriage-return (ASCII 13) or a linefeed (ASCII 10) character. Upon power-on the unit will transmit a "sign-on" message. A command prompt will be transmitted after the “sign-on” message and after each command is processed. It will normally consist of a carriage-return (ASCII 13), a linefeed (ASCII 10) and the character “>”. After a command error is detected, the command prompt will consist if a carriage-return (ASCII 13), a linefeed (ASCII 10) and then the character “?”.

The “S” command may be used to report the current GPIB serial poll byte value. It will be transmitted as a numeric string from “0” to “255”.

When the unit is busy, the serial ports “CTS” line will be held in the inactive state; otherwise the “CTS” line is in the active state. No commands should be sent to the unit while the “CTS” line is in the active state.

Comm parameters		DBP Connector PIN
Rate	9600	1 N/C
Data Bits	8	2 RxD
Hardware Handshake	OFF	3 TxD
Flow Control	OFF	4 N/C
Xon/Xoff	OFF	5 GRD
Stop Bits	1	6 N/C
Parity	NONE	7 RTS
Local Echo	ON	8 CTS
Comm Port	SELECT	9 N/C