SECTION 1 GENERAL DESCRIPTION

1.1 INTRODUCTION

This instruction manual contains information relative to the installation, operation and calibration of the California Instruments Model 959XPT and the MXT10 Interface Module. Information is provided to completely calibrate a power system with any California Instruments power source.

1.2 GENERAL DESCRIPTION

The 959XPT is a plug-in oscillator for a California Instruments 3-phase XP-Series AC Power Source or MXT10 Interface Module.

It obtains its primary operating power from the device in which it is installed. The 959XPT provides the AC signal for the AC power source. The AC signal from the 959XPT may be programmed for frequency, amplitude, phase angle, and distortion. An option for the 959XPT allows it to program the type of waveform. The 959XPT also provides the means to measure the output voltage, current, frequency, phase angle, true power, apparent power and power factor. In addition, the 959XPT can be programmed for an output current limit value in amps. The 959XPT will synchronize the output frequency and phase angle to an external sync input at the rear panel of the device in which the 959XPT is installed.

When the 959XPT is used with an MXT10 Interface Module it can be used as a component of a power system that has California Instruments T-Series power sources. It can also be used with other power sources that are not mechanically or electrically compatible with the 959XPT. The MXT10 Interface Module supplies the DC supplies for the 959XPT, the current transformers for current and power measurement and a current limit assembly. The MXT10 Interface Module also has all of the connections for interface to the power sources.

1.3 ACCESSORY EQUIPMENT

An Extender Assembly, California Instruments Part Number 4930-705, is available. It permits test and adjustment of the 959XPT external to the power source in which it is installed. An Extender Cable, Part Number 4849-203-1, is also available. It connects the circuit boards of the 959XPT to the mother board during test and servicing.

1.4 SPECIFICATIONS

Specifications for the Model 959XPT AC Power Controller are listed in Table 1-1. Note that these specifications apply when the 959XPT is used with a power source.

TABLE 1-1

MODEL 959XPT AC POWER CONTROLLER SPECIFICATIONS

AMPLITUDE PROGRAM (All specifications apply from 45 Hz to 70 Hz. Specifications of the power source apply above 70 Hz.)

VOLTAGE RANGES	156/312 are standard.
VOLTAGE ACCURACY: (25 degrees C ±1 degree C) (Based on TRMS)	±0.5 volts
TEMPERATURE COEFFICIENT:	±0.05 volts per degree C average from 25 degrees C.
LOAD REGULATION:	AC Source Specification
LINE REGULATION:	AC Source Specification
DISTORTION: (THD=0 Programmed)	(AC Source Specification +.5)%
DEFAULT VOLTAGE:	0.0 Volts.
DEFAULT RANGE:	Either range of specified range pair. 156 volt range is standard.

DISTORTION PROGRAM (Sine wave only. All phases may be independently programmed.)

RANGE:	0 to 20% THD
RESOLUTION:	1%

FREQUENCY PROGRAM

FREQUENCY RANGE:	45.00 (or other low limit) to 500 Hz (or other high limit).
FREQUENCY RESOLUTION:	0.01 Hz from 45.00 to 99.99 Hz 0.1 Hz from 100.0 to 500.0 Hz
FREQUENCY ACCURACY: (25 degrees C ±1 degree C)	±0.001% of programmed value
TEMPERATURE COEFFICIENT:	±5ppm/degrees C from 25 degrees C
LONG TERM STABILITY: (25 degrees C ±1 degree C)	±15 PPM of Programmed Value per year.
DEFAULT FREQUENCY: (Initial Value)	ANY (60 Hz is standard)

PHASE ANGLE PROGRAM

PHASE ANGLE RANGE: (Phase B and C relative to A and Phase A relative to an optional external sync input)	0 to ±999.9 degrees in .1 increments.
DEFAULT (Phase C):	ANY, but 0 defines Single Phase. Any value except 1000 and 120 defines Two-Phase. 120 defines Three-Phase.
PHASE ACCURACY	
PHASE B AND C:	±1 degree; add 0.5 degrees per KHz above 2 KHz.
PHASE A:	±6 degrees to 500 Hz.

CURRENT LIMIT (Independent or simultaneous control of each phase)

RANGE:	0 to maximum current of power source (example 8.00 amps)
RESOLUTION:	1 part in 256 (example 0.04 amps for 8 amps Full Scale)
DEFAULT ACTION	will operate at programmed current limit for 0.1 seconds before defaulting to 0.0 volts.

MEASUREMENT SPECIFICATIONS

VOLTS

RANGE:	0.0 to 312.0 volts.
RESOLUTION:	0.1 Volt
ACCURACY:	±(0.2% RDG + 3 digits)
TEMPERATURE COEFFICIENT:	±0.05 volts per degree C

CURRENT (Crest Factor of 3 at 10 or 100 Amps increasing to 15 at 20% of range)

RANGE:	10.00 or 100.0 Amps
RESOLUTION:	0.01 Amp or 0.1 Amp
ACCURACY:	±(0.3% RDG + 3 digits)
TEMPERATURE COEFFICIENT:	±0.016% of Full Scale current per degree C

POWER

RANGE:	0.0 to 4000 watts or 40.00 KW.
RESOLUTION:	1 watt or 0.01 KW
ACCURACY:	±(0.4% RDG + 3 digits) to 500 Hz
TEMPERATURE COEFFICIENT:	±0.06% of Full Scale per degree C.

POWER FACTOR

RANGE:	0.000 TO 1.000

PHASE (at Full Scale voltage)

RANGE:	0 to 360 degrees
RESOLUTION:	0.1 degree
ACCURACY:	±1 degree to 500 Hz

FREQUENCY

RANGE:	45 to 500 Hz
RESOLUTION:	Four decades
ACCURACY:	±0.02 Hz to 99.99 ±0.2 Hz to 500.0

MEASUREMENT SPECIFICATIONS (continued)

VA

RANGE:	0.0 to 4000 VA or 40.00 KVA
RESULTION:	1 VA or 0.01 KVA
ACCURACY:	±(.5% RDG +6 digits) to 500 Hz

SQUARE WAVE OPERATION (Option)

RISE & FALL TIME:	Dependent on power source. Typically less that 40 usec.
DROOP:	Less than 2% at 50 Hz
OVERSHOOT:	Dependent on power source. Typically less than 10%.

SPECIFICATIONS (GENERAL)

INPUT POWER (MXT10/959XPT Combination)

NOMINAL	RANGE
115	104 to 132
100	87 to 110
208	191 to 229
220	198 to 242
230	207 to 253
240	216 to 265

NOTE

The input line voltage can be changed at the rear panel of the MXT10 with the range-change card inside the input power receptical.

FREQUENCY:	48 to 65 Hz
EXTERNAL SYNC INPUT:	45 Hz to 500 Hz.
REGISTERS:	16 Nonvolatile

DISPLAY

DATA:	Two lines, 16 characters long, of alphanumeric information.

SPECIFICATIONS (GENERAL) [continued]

LOCAL CONTROL:	20-key keyboard.
REMOTE PROGRAMMING	
IEEE-488-1978 SUBSETS:	SH1, AH1, T6, L3, SR1, RL2, DC1, DT1
IEEE-728-1982 OPERATING CODES AND FORMATS:	NUMERIC REPRESENTATION; NR1, NR2 OR NR3. HEADERS; HR1 OR HR2 (UPPER OR LOWER CASE) MESSAGE SEPARATORS; SR1
DATA TRANSFER RATE:	200K bytes/second using DMA methods
END OF STRING:	(CR) & (LF) or (END), (LF) or (END)
DATA FORMAT:	Scientific notation or explicit point
EXTERNAL MODULATION	
INPUT FREQUENCY:	45 to 5 KHz
% MODULATION:	0 to 5 VRMS input generate 0 to 11% amplitude modulation of the output.
DIMENSIONS:	
MXT10/959XPT:	Height 3.5" (89mm)
	Width 19.0" (483mm)
	Depth 18.0" (431mm)
NET WEIGHT:	
MXT10/959XPT:	12 pounds (6 kg)