

XP95/Series 90 Test Set

User Manual

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1.0 General Description

The Apollo XP95/Series 90 test set is a self-contained, hand-held test unit capable of providing a number of useful functions in relation to individual monitors, ancillary devices or complete circuits of analogue addressable devices in the Apollo XP95 or Series 90 ranges.

The main function of the XP95 test set is to enable an engineer to test and commission a loop of devices fully before the control panel is installed. It can also be used for on/off-site maintenance and device performance testing and includes a powerful data log function for long-term soak testing.

The unit may be powered from an AC power supply unit or from its own internal batteries. When the test set is used on the mains supply, the batteries are continuously maintained in a healthy condition by the integral charger circuit. The length of time for which the test set may be run on batteries varies greatly, depending on the loop load and printer usage, but approximately 8 hours can be assumed as an average.

Sockets on the membrane allow the engineer to connect the loop or device to the test set (note that correct polarity must be observed when isolators are fitted).

A printer is available as an optional extra.

For ease of transport the test set is supplied with a carrying case, complete with charger and leads.

2.0 User Functions

The user functions are displayed in the form of a menu with option numbers and are selected by pressing the appropriate number on the keypad. Available functions are:

2.1 Function 1 - Single Address Test

This function allows the user to interrogate and control individual devices. The test set provides a display which shows the device type, returned address and analogue value, as well as the input and output bit status. The user can set the output (or forward command) bits to logic high or logic low.

2.2 Function 2 - Device Types

Selecting this function causes the display to show single letter characters which identify the type of device at each of the first 63 addresses. The second page of information – for devices 64 to 126 – is accessed by pressing the # key.

2.3 Function 3 - Loop Scan Test

When this function is selected, the test set prompts the user to enter an analogue value as a reference. The unit automatically scans all addresses and provides a list of all devices which report analogue values equal to or greater than the level selected.

2.4 Function 4 - Identify Device

When 4 is selected, the test set automatically polls all addresses, starting at 1, until it encounters a device. It then displays the address, type, analogue value and series type of the device found.

2.5 Function 5 - Interrupt/Alarm Test

With this function selected, the test set reports interrupt bits placed on the line by manual call points or alarm flags placed by XP95 monitors. XP95 interrupt or alarm addresses are also shown.

2.6 Function 6 - Print Device Types

This function is identical to function 2, with the exception that device types are printed rather than displayed on the LCD. (The printer is an optional extra).

2.7 Function 7 - Print Loop Report

This allows the engineer to obtain a print-out of the address, analogue value, device type, device series and input/output bit status of a single device, a group of devices or all devices connected to the loop under test.

2.8 Function 8 - Loop Data Save

This function allows the engineer to save up to four loops of device data so that a review can be carried out at a later stage.

2.9 Function 9 – Loop Data Log

By selecting this function the performance of a device or loop of devices can be logged over a period of time and the results examined or printed at a later stage.

2.10 Function 0 – Help Menu

A full description of the functions of the various keys is available by selecting this option.

3.0 Operating Instructions

When the test set is first powered up it will display and print (if a printer is connected) a message as follows:

```
APOLLO FIRE DET
XP95/S90 TEST SET
A1450 SOFTWARE V6.0
1/11/93
```

After the initialising message, the test set will show the first of three menu options:

```
1: SINGLE ADDR. TEST
2: DEVICE TYPES
3: LOOP SCAN TEST
* = NEXT PAGE
```

By selecting *, the next three options are displayed:

```
4: IDENTIFY DEVICE
5: INT/ALARM TEST
6: PRINT DEV. TYPES
* = NEXT PAGE
```

The third menu option:

- 7: PRINT LOOP REPORT
- 8: LOOP DATA SAVE
- 9: LOOP DATA LOG
- * = NEXT PAGE

Finally, the Help option is shown:

- 0: HELP MENU
- * = NEXT PAGE

In the following pages the individual menu operations are described and instructions for use of the options given. Each option is referred to as it appears in the test set display.

3.1 1. Single Addr. Test

This option allows an engineer to monitor a single device. The information shown is:

- the address
- the analogue value
- the device type
- device series (XP95 or Series 90)
- output bit status
- input bit status

The display format is:

ADDR	1	XP95	BITS
VALUE	24.5		012
TYPE OPT		O/P	000
* = EXIT		I/P	000

In this mode, keys to can also be selected in order to carry out further tests on the device under test.

3.1.1 Key

When key is pressed, output bit 0 changes from logic 0 to 1.

DEV	1	XP95	BITS
VALUE	24.5		012
TYPE OPT		O/P	000
* = EXIT		I/P	000

Press key and the display changes to:

DEV	1	XP95	BITS
VALUE	24.5		012
TYPE OPT		O/P	000
* = EXIT		I/P	000

3.1.2 Key

When key is pressed, output bit 1 changes from logic 0 to 1.

DEV	1	XP95	BITS
VALUE	24.5		012
TYPE OPT		O/P	000
* = EXIT		I/P	000

Press key and the display changes to:

DEV	1	XP95	BITS
VALUE	24.5		012
TYPE OPT		O/P	000
* = EXIT		I/P	000

3.1.3 Key

When key is pressed, output bit 2 changes from logic 0 to 1.

DEV	1	XP95	BITS
VALUE	24.5		012
TYPE OPT		O/P	000
* = EXIT		I/P	000

Press key and the display changes to:

DEV	1	XP95	BITS
VALUE	24.5		012
TYPE OPT		O/P	000
* = EXIT		I/P	000

3.1.4 Key

This key enables the selection of a new device address:

```
CURRENT ADDRESS =          1
NEW ADDRESS?
* = REDO  # = OK
```

To select a new address, press the appropriate numeric keys and enter with the # key.

3.1.5 Key

This key initiates self test. The device connected will reach an analogue value of 55 or greater – a pass – or it will not reach 55 or greater within 10 seconds and will fail. In the case of a pass, the time taken to reach the threshold is displayed.

In the case of a pass, the display is as follows:

```
*DETECTOR SELF TEST*
A. VALUE = 55.5  XP95
DEV 2  PASS 1.5 SECS
* QUIT  # AGAIN
```

In the case of a failure the display is as follows:

```
*DETECTOR SELF TEST*
A. VALUE =    XP95
  **FAILED**
  * QUIT  # AGAIN
```

3.1.6 Key

This displays the minimum and maximum analogue values reported by the device during the single device test, as well as the current analogue value. In this menu option, RESET puts both minimum and maximum values to the current value.

```
ANALOGUE VALUE
ADDR    2    MIN 26.0
NOW 26.5    MAX 26.5
* = QUIT  # = RESET
```

3.1.7 Key

This moves the test to the next lower address, even if no device of that address is connected.

```
ADDR      2    XP95    BITS
VALUE     24.5
TYPE OPT
* = EXIT          O/P    000
                  I/P    000
```

When key is pressed, the display changes as follows:

```
ADDR      1    XP95    BITS
VALUE     24.5
TYPE OPT
* = EXIT          O/P    000
                  I/P    000
```

3.1.8 Key

This moves the test to the next higher address, even if no device of that address is connected.

```
ADDR      1    XP95    BITS
VALUE     24.5
TYPE OPT
* = EXIT          O/P    000
                  I/P    000
```

When key is pressed, the display changes as follows:

```
DET       2    XP95    BITS
VALUE     24.5
TYPE OPT
* = EXIT          O/P    000
                  I/P    000
```

NOTE: *If the “Device Type” identifying letter pulses, this indicates that two or more devices have the same address setting.*

3.2 2. Device Types

All 126 addresses are scanned to determine the type of device connected. The types are displayed as single letters in two blocks of 63. The # key is used to alternate between the two blocks. If no device is connected to a particular address, the display at that address is 'S' for SPARE.

Page 1, devices 1 – 63:

```
00 –DDDDDDDDDDDDDD
16 –DDDDDDDDDDDDDD
32DDDDDDFFFFFFFFF
48FFFFFFFFFFFFFFFFF
```

When the # key is pressed, the second page of device types is shown:

Page 2, devices 64 – 126

```
64FFFFFFFFFGGGGGG
90GGGGGGGGGGGGGG
96GGGGGGGGGGGGHHH
112HHHHHHHHHHHHS-
```

The number at the start of each line represents the address of the first device in the line and the significance of the letters is as follows:

```
S = SPARE
A = S90 SHOP MONITOR UNIT
B = S90 SOUNDER CIRCUIT CONTROLLER
C = S90 INPUT/OUTPUT UNIT
D = S90 IONISATION SMOKE MONITOR
E = S90 ZONE MONITOR UNIT OR CONTROL UNIT MONITOR
F = S90 OPTICAL SMOKE MONITOR
G = S90 TEMPERATURE MONITOR
H = S90 CALL POINT MONITOR
L = XP95 IONISATION SMOKE MONITOR
N =XP95 OPTICAL SMOKE MONITOR
O = XP95 TEMPERATURE MONITOR
P = XP95 MANUAL CALL POINT
Q = XP95 HIGH TEMPERATURE MONITOR
```

NOTE: *If the 'Device Type' identifying letter pulses, this indicates that two or more devices have the same address settings.*

To exit the first menu option press *.

3.3 3. Loop Scanning Test

This test scans all 126 addresses to check the analogue value against a level pre-set by the engineer. The number of devices having an analogue value equal to or greater than the set level is displayed, as is the address of the first such device found. Pressing the # key displays the address of the next device with an analogue value equal to or greater than the pre-set level. The set level is changed by pressing the 0 key.

```
LOOP SCANNING TEST
PRESENT LEVEL =      16
NEW LEVEL =
* = QUIT   # = ENTER
```

To set a level of 21, press keys `21`, and then `#`

```
No of dets>=21 =
Address =
# for next, * to exit
0 to change level
```

3.4 4. Identifying Device

When 4 is selected, the test set automatically scans all addresses, starting at 1, until it encounters a device. It then displays the address, type, analogue value and the series type (Series 90 or XP95) of the device found.

```
IDENTIFY DEV. MODE
ADDR. OUT  1  IN   1
TYPE OPT   XP95
VAL       24.5 *END  #NXT
```

3.5 5. Interrupt/Alarm Test

This test allows the engineer to test either the interrupt generated by manual call points (and, in the case of XP95, the interrupt address) or the alarm flag and alarm address of XP95 monitors. After selecting 5, the display shows:

```
INTERRUPT/ALARM TEST
1: INTERRUPT TEST
2: ALARM/ADDR. TEST
* QUIT
```

3.5.1 Interrupt Test

Press key

```
MCP INTERRUPT TEST
OPERATE MCP TO CONT
* = QUIT
```

Operate manual call point. correct placement of the interrupt bit is confirmed by the display:

```
MCP INTERRUPT TEST
MCP S90
INTERRUPT OK
* QUIT  # AGAIN
```

3.5.2 Alarm Flag/Address Test

Press key

```
ALARM/ADDRESS TEST
OPERATE DEV TO CONT
* = QUIT
```

Operate an XP95 device so that it reaches an analogue value of 55 or greater and the display will show:

```
ALARM ADDRESS TEST
DEVICE 3 XP95
ALARM/ADDRESS SEEN
* QUIT # AGAIN
```

3.6 6. Print Device Types

This allows the user to obtain a print-out of all the devices on a loop. The print-out is identical to pages 1 and 2 of test 2 (DEVICE TYPES) and includes the same explanatory legend.

3.7 7. Print Loop Report

Selection of test 7 causes the test set to print out the analogue value, device type, device series (XP95 or Series 90) and the input/output bit status of a single device, a group of devices or all devices connected to the loop under test.

```
PRINT LOOP REPORT
1: SINGLE DEVICE
2: GROUP DEVICES
3: ALL DEVICES
```

Press key

```
CURRENT STAT REPORT CMD
ADDR VAL TYPE OP IP
001 024.0 OPT XP95 000000
```

3.8 8. Loop Data Save

This test allows the engineer to save and subsequently view or print out information on up to 4 loops of devices as in test 1 or test 2. The data is stored in a non-volatile memory and is therefore secure, even if the test set is switched off.

```
1: SAVE LOOP DATA
2: VIEW SAVED LOOP
3: PRINT SAVED LOOP
```

Press and the display changes to:

```
**LOOP DATA SAVE**  
PLEASE ENTER LOOP  
NUMBER 1 TO 4  
* = REDO # = OK
```

Enter the loop number required using numeric and the # keys.

```
*SAVING LOOP DATA*  
PLEASE WAIT
```

When the loop data has been saved, the display reverts to the initial test 8 display. Press to view the saved loop data:

```
VIEW SAVED LOOP  
1: SAVED DEV TYPES  
2: SAVED SINGLE DEV  
* = END
```

To see the saved device type press .

```
SAVED LOOP TYPES  
PLEASE ENTER LOOP  
NUMBER 1 TO 4  
* = REDO # = OK
```

Press any number between and , then #.

In order to view the saved single devices it is necessary to select option 2 from the VIEW SAVED LOOP menu:

```
SAVED LOOP TYPES  
PLEASE ENTER LOOP  
NUMBERS 1 - 4  
* = REDO # = OK
```

Enter any number between and , then #. The display will then show:

```
ADDR 1          BITS  
VALUE          012  
TYPE           SPARE O/P 000  
* = EXIT      I/P 000
```

which is always address 1 of the chosen loop.

Once in this mode, it is possible to scan through all the other devices using the UP/DOWN or NEW address key.

3.9 9. Loop Data Log

The purpose of this test is to monitor the performance of a loop over a chosen period of time. The test set is connected to a loop and simply left to log data until it is disconnected by the engineer. For this test to be useful, the engineer must have a thorough understanding of the theory of the XP95 communications protocol and practical experience of its application.

After selecting , the following display appears:

- 1: START DEV LOG
- 2: VIEW DEV LOG
- 3: PRINT DEV LOG

Press to start the log:

```
***START LOG***
PREV. STORED DATA
  WILL BE ERASED!
* = QUIT # = START
```

Press #. The display flashes to warn the engineer that the test set is in the process of logging data.

```
**LOOP DATA LOG**
LOG IN PROGRESS
* = SAVE LOG
```

When the data log has been terminated, stored data is viewed by pressing option 2 of the original menu. The display then shows the following sub-menu:

- 1: DEVICE MISMATCH
- 2: INTERRUPT COUNT
- 3: ALARM/ADDR.COUNT
- * = END

3.9.1 Option 1

If option 1 is chosen the screen shows:

```
ADDR.  1          OK
TYP NON          OK
I/P 000 000      OK
AV 0   MN 0      MX 0
```

This function compares the returned input, device type and address confirmation bits of all connected loop devices from the initial scan with all subsequent scans recorded in the data log. Any single mismatch of bit data will be registered.

3.9.2 Option 2

If option 2 is chosen the screen shows:

```
**INTERRUPT COUNT**
NO OF INTERRUPTS
SEEN =
* = END
```

For the duration of the data logging period, the test set is looking for and counting the number of interrupt bits sent.

3.9.3 Option 3

If option 3 is chosen the display is:

```
*ALARM/ADDR COUNT*
NO OF ALARM/ADDR.
SEEN =
* = END
```

Here, any XP95 alarm flag or interrupt/alarm address generated by any loop device will be counted and logged in the data logging facility. The number of such alarm flags/addresses can be viewed using this function.

NOTE: Both the interrupt and alarm flag counters terminate at 999 counts without overflow.

3.9.4 After selecting test 9 the third main option is “PRINT DEV LOG”. Press and the display will change to:

```
1: PRINT DEV MISMATCH
2: PRINT INT COUNT
3: PRINT AL/ADD COUNT
* = NEXT PAGE # = END
```

(i) Choose PRINT DEV MISMATCH and the display will change to:

```
PRINT DEVICE LOG
1: SINGLE DEVICE
2: GROUP DEVICES
3: ALL DEVICES
```

Choose option 1 and the display will change to:

```
PRINT DEVICE LOG
DEV ADDRESS =
* = BKSPACE # = ENTER
```

After an address has been keyed in and entered with the # key, the report is printed.

If option 2 of the PRINT DEV MISMATCH sub-menu is selected, the display shows:

```
PRINT DEVICE LOG
START ADDRESS =
END ADDRESS =
* = BKSPCE # = ENTER
```

Enter the range of addresses and press # to run the report.

If option 3 of the PRINT DEV MISMATCH sub-menu is selected, the report is printed. All 126 addresses will be printed regardless of the number of loop devices connected. While any of the reports on options 1-3 are being printed, the display reads:

```
PRINTING DEVICE
MISMATCH REPORT
* = EXIT
```

Should a mismatch of returned bit data occur, the report will display “MIS” instead of “OK” as shown below:

```
**** PRINT LOG ****
*DEVICE MISMATCH REPORT*
  ADDRESS  TYPE  INPUT
001      MIS   MIS   OK
```

Press * to exit from the print routine.

(ii) Select , PRINT INT COUNT

The number of interrupts seen for the duration of the data log will be printed:

```
**** PRINT LOG ****
*INTERRUPT COUNT REPORT*
  NUMBER OF INTERRUPTS
  SEEN = 0
```

(iii) Select , PRINT AL/ADD COUNT

The number of alarm flags/alarm addresses (XP95 only) seen for the data logging record period will be printed:

```
ALM/ADDR. COUNT REPORT
  NUMBER OF ALM/ADDRESSES
  SEEN = 0
```

Option 4 is accessed by entering* (next page).

(iv) Select , PRINT A. VALUES. This display will change to:

```
PRINT LOG A. VALUE
1: SINGLE DEVICE
2: GROUP DEVICES
3: ALL DEVICES
```

Select , SINGLE DEVICE

```
PRINT LOG A. VALUE
DEV ADDRESS =
```

* = BKSPCE # = ENTER

Select an address and enter #. The current, minimum and maximum analogue values for the data logging period are printed:

```
**** PRINT LOG ****
*ANALOGUE VALUE REPORT*
  ADDR.  ANALOGUE VALUE
        NOW  MIN  MAX
001      023   000  023
```

Select , GROUP DEVICES

PRINT LOG A. VALUE
START ADDRESS =
END ADDRESS =

* = BKSPCE # = ENTER

Enter the range of addresses and press # to run the report.

Select , ALL DEVICES

All 126 addresses will be printed, regardless of the number of loop devices connected.
Press * to exit from the print routine.

3.10 0. Help Menu

A Help menu is available by simply pressing 0. The Help menu covers the information given in this manual.

Appendices

i Technical Specifications

General

Operating voltage	24V DC (regulated)
Input voltage	30V DC @ 300mA (unregulated charger output)
Mains voltage	240V/12V AC, 50/60Hz (switchable input to charger)
Internal batteries	20 x 500mA AA NiCad cells
Battery replacement period	5 years
User display	4 lines x 20 character alpha-numeric LCD
User controls	12 key numeric keypad
Loop protection	Sensor lines – 1 x 250mA self-resetting thermal fuse
User connection	2 x 4mm line sockets 16 pin printer connection 2.5mm power/charger unit input socket
Enclosure	High impact polystyrene moulding
Dimensions	185mm long x 135mm wide x 40mm deep
Weight	1kg (including integral batteries)
Optional accessories	Leather carrying case Remote printer

Loop Output

Loop voltage @ 35mA	DC 23V
(external load)	AC modulation 8.5V
Maximum loop load	200mA (no line resistance)
Maximum series line resistance	200 Ω @ 30mA load 400 Ω @ 10mA load
Max. loop parallel capacitance	0-2mA 4 μ F 2-11mA 1.5 μ F 11+mA 1.0 μ F
Current pulse capture sensitivity	12mA minimum (no line resistance)

ii Other Relevant Documentation