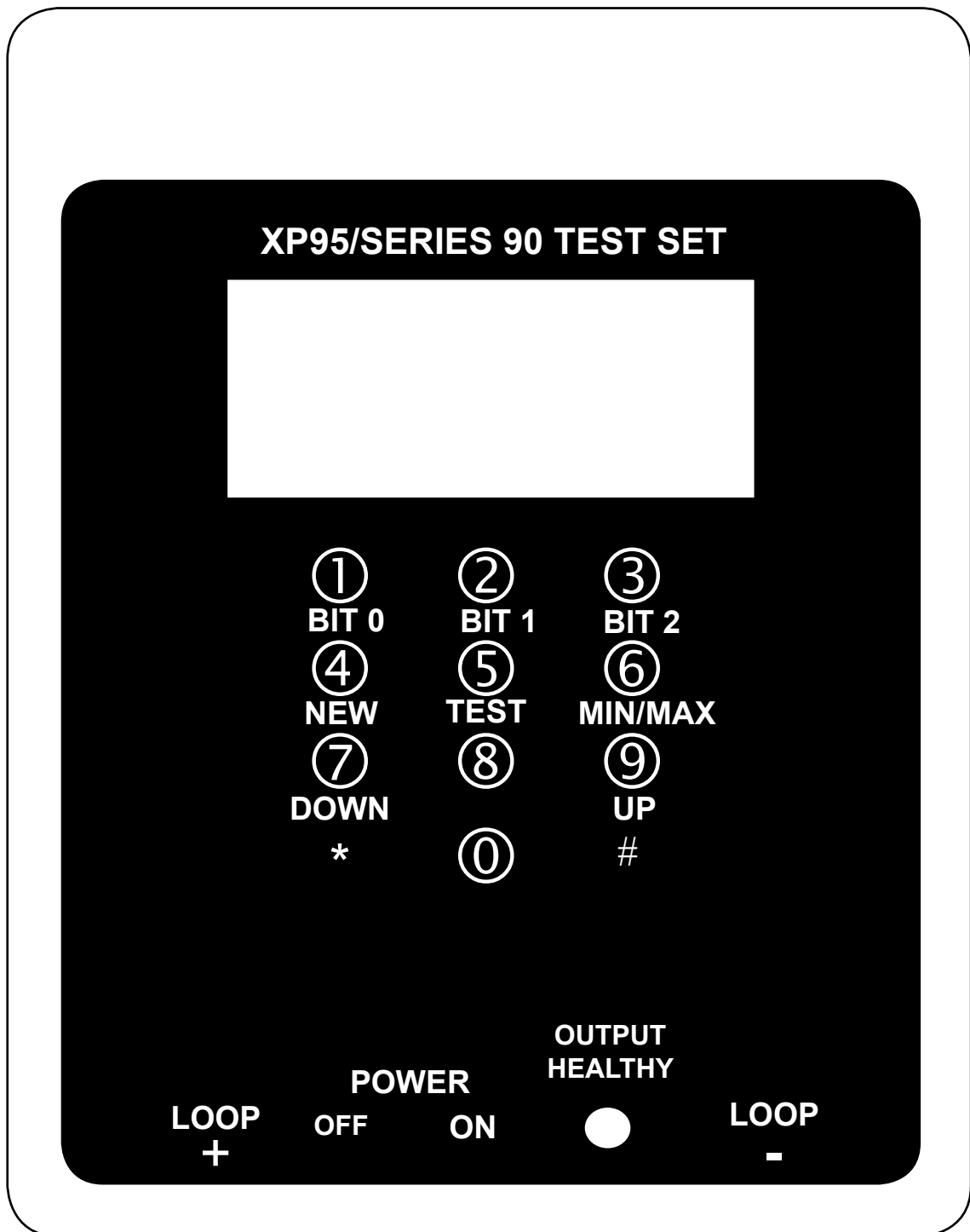


XP95/Series 90 Test Set



User Manual

Apollo XP95/Series 90 Test Set User Manual

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I. General Description

The Apollo XP95/Series 90 test set is a self-contained, portable 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 help the engineer guarantee correct loop configuration before an active control panel is installed. It provides a means of interrogating and controlling all devices connected and displays information in user-friendly format on an LCD.

The unit may be powered from an AC mains charger unit or from its own internal batteries. It is supplied with a three pin plug for use in the UK and a two pin (DIN) plug for use in the rest of Europe. When the test set is used on the mains supply, the batteries are continuously maintained in a healthy condition by the integral charger circuit. When it is necessary to run the test set in battery mode, it will operate for 8 hours if the battery is fully charged.

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.)

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

II. 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:

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. Detector 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.

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.

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.

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 detectors. XP95 interrupt or alarm addresses are also shown.

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.

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.

8. Loop data save

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

9. Loop data log

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

0. Help menu

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

III. 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 V9.0
14/6/95
```

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 is:

```
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.

1. Single Addr. Test

This option allows an engineer to monitor a single device. The information shown includes; the address, analogue value, device type, device series (XP95 or Series 90), output bit status and input bit status.

The display format is:

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

In this mode keys 1 to 9 can also be selected in order to carry out further tests on the device under test.

Key 1

When key 1 is pressed, output bit 0 changes from logic 0 to 1. For output command bit functions, please refer to the Series 90/XP95 Product guide or Series 90/XP95 PIN sheets.

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

Press Key 1 and the display changes to:

DEV	1	XP95	BITS
VALUE	24.5		012
TYPE OPT		O/P	100
* = EXIT		I/P	100

Key 2

When key 2 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 2 and the display changes to:

DEV	1	XP95	BITS
VALUE	70.0		012
TYPE OPT		O/P	010
* = EXIT		I/P	010

Key 3

When key 3 is pressed, output bit 2 changes from logic 1 to 0.

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

Press key 3 and the display changes to:

DEV	1	XP95	BITS
VALUE	24.5		012
TYPE OPT		O/P	001
* = EXIT		I/P	001

Key 4

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.

Key 5

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 10s 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:

```
*DEVICE SELF TEST*
A. VALUE = 55.5  XP95
DEV 2 PASS 0.1 SECS
* QUIT # AGAIN
```

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

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

Key 6

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
```

Key 7

This selects the next lower address, even if no device of that address is connected.

```
DET 2 XP95 BITS
VALUE 24.5 012
TYPE OPT O/P 001
* = EXIT I/P 001
```

When key 7 is pressed, the display changes as follows:

```
DET 1 XP95 BITS
VALUE 24.5 012
TYPE OPT O/P 001
* = EXIT I/P 001
```

Key 9

This selects the next higher address, even if no device of that address is connected.

```
DET 1 XP95 BITS
VALUE 24.5 012
TYPE OPT O/P 001
* = EXIT I/P 001
```

When key 9 is pressed, the display changes as follows:

```
DET 2 XP95 BITS
VALUE 24.5 012
TYPE OPT O/P 001
* = EXIT I/P 001
```

Note: If the S90 or XP95 text flashes, two or more devices have the same address setting (dual address).

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 DDDDDDDDDDDDD
32 DDDDDDDDDDDDD
48 FFFFFFFFFFFFFFFF
```

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

Page 2, devices 64 - 126

```
64 FFFFFFFFFGGGGGGG
80 GGGGGGGGGGGGGGG
96 GGGGGGGGGGGGHHH
112 HHHHHHHHHHHHHS-
```

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 Unit Monitor
- B S90 Sounder Circuit Controller
- C S90 1ch & 3ch Input/Output Units
- D S90 Ionisation Smoke Detector
- E S90 Zone Monitor Unit, S90 Control Unit Monitor
- F S90 Optical Smoke Detector
- G S90 Temperature Detector
- H S90 Manual Call Point & S90 Manual Call Point Monitor
- J XP95 Sounder Control Unit & XP95 100dB(A) Loop Sounder
- K XP95 Input/Output & Output Units
- L XP95 & Discovery Ionisation Detectors
- M XP95 Zone Monitor Unit
- N XP95 & Discovery Optical Detectors
- O XP95 & Discovery Temperature Detectors
- P XP95 Manual Call Point, XP95 Mini Switch Monitor with Interrupt & Discovery Manual Call Point
- Q XP95 High Temperature Detector
- R XP95A Priority Switch Monitor Module
- T XP95A Mini Switch Monitor Module
- U XP95A Switch Monitor Module
- W XP95A Switch Monitor Input/Output Module
- X XP95A Sounder Control Module
- m XP95 Mini Switch Monitor, XP95 Switch Monitor, XP95 Switch Monitor Plus
- p Beam Detector
- q Flame Detector
- r XP95 & Discovery Multisensor
- v XP95A Mini Priority Switch Monitor Module
- j,k,l Reserved for CO Detectors
- o Reserved for Aspirating Devices

Note: if the 'device type' indentifying letter pulses, two devices have the same address setting (dual address).

To exit the first menu option press *

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 preset level. The set level is changed by pressing the 0 key.

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

To set a level of 21, press keys 2, 1 and then #

```
NO OF DEVS >= 21 = 6
ADDRESS = 1
# SCROLLS THE NEXT ADDRESS > = 21
* TO EXIT
0 TO CHANGE LEVEL
```

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
```

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 devices. After selecting 5, the display shows:

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

5.1 Interrupt Test:

Press key 1

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

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

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

5.2 Alarm Flag/Address Test:

Press key 2

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

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

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

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 legend.

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 3. Typical printout is shown below:

```
CURRENT STAT REPORT CMD
                                OP IP
ADR VAL TYPE                    012012
001 024.0 OPT XP95 000000
```

8. Loop Data Save

This test allows the engineer to save and subsequently view or print out information on up to 4 loops of device 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 1 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 2 to view the saved loop data:

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

To see the saved device types press 1.

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

Press any number between 1 and 4, 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 1 and 4, then #.

The display will then show:

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

9. Loop Data Log

The purpose of this test is to monitor the performance and data integrity 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 set 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 9 the following display appears:

```
1. START DEV LOG
2. VIEW DEV LOG
3. PRINT DEV LOG
```

Press 1 to start the log:

```
**START LOG**
PRE-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
* = END
```

During logging, the test set and loop must not be disconnected. Disconnect any printer connection.

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
```

If option 1 is chosen the screen shows:

```
ADDR 1      OK
TYPE OPT    OK
I/P 000 000 OK
AV 25 MN 23 MX 27
```

Keys 7 and 9 may be used to scroll up and down addresses or key 4 to select an individual address.

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 and displayed a "MIS".

If option 2 is chosen the screen shows:

```
**INTERRUPT COUNT**
NO OF INTERRUPTS
SEEN = 0
* = END
```

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

If option 3 is chosen the display is:

```
*ALARM/ADDR COUNT*
NO OF ALARM/ADDR
SEEN = 0
* = 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.

After selecting test 9 the third main option is "PRINT DEV LOG". Press 3 and the display will change to:

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

Choose 1, 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 =
* = BKSPACE    # = 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
```

```
* = END
```

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.

Select 2, 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
```

Select 3, PRINT AL/ADD COUNT

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

```
*****PRINT LOG*****  
ALM/ADDR. COUNT REPORT  
NUMBER OF ALM/ADDRESS  
SEEN = 0
```

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

Select 4, PRINT A. VALUES. The display will change to:

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

Select 1, 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 2, GROUP DEVICES

```
PRINT LOG A. VALUE  
START ADDRESS =  
END ADDRESS =
```

* = BKSPCE # = ENTER

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

Select 3, ALL DEVICES

All 126 addresses will be printed, regardless of the number of loop devices connected.

Press * to exit from the print routine.

0. Help Menu

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

IV. Technical Specification

General

Part Number	55000-870
Input voltage	30 V DC at 300 mA (unregulated charger output)
Mains voltage	240/120V AC 50/60 Hz (switchable)
Internal batteries	20 x 500 mA AA NiCad cells
Battery replacement period	5 Years
User display	4 lines x 20 character alpha-numeric LCD Loop healthy monitoring LED
User controls	12 key numeric keypad
Loop protection	Sensor lines – 1 x 250 mA self-resetting thermal fuse
User connection	2 x 4 mm line sockets 16 pin printer connection 2.5 mm power/charger unit input socket
Enclosure	High impact polystyrene moulding
Dimensions	85 mm long x 135 mm wide x 40 mm deep
Weight	1 kg (including integral batteries)

Loop Output

Loop voltage	23V DC (nominal) 8.5V protocol pulses
Maximum loop load	200 mA (no line resistance)
Maximum series line resistance	200 Ω at 30 mA load 400 Ω at 10 mA load
Maximum loop parallel capacitance	0 – 2 mA 4 μ F 2 – 11 mA 1.5 μ F 11+ mA 1.0 μ F
Current pulse capture sensitivity	12 mA minimum (no line resistance)



XP95/Series 90 Type Code Allocation

Test Set Software Version: V9.0

Description	Type Code Bits		Test Set Description	
	2 1 0	4 3	Menu 1	Menu 2
Shop Unit Monitor	0 0 0	0 0	Shop	A
User	0 0 0	0 1	Special	a
User	0 0 0	1 0	Special	b
User	0 0 0	1 1	Special	c
Series 90 Sounder Circuit Controller & Loop Sounder	0 0 1	0 0	SCC	B
XP95 Sounder Control Unit & 100dB Loop Sounder	0 0 1	0 0	SCC	J
XP95A Sounder Control Module	0 0 1	0 1	SCM	X
	0 0 1	1 0	Special	e
	0 0 1	1 1	Special	f
Series 90 1 Channel & 3 Channel Input/Output Units	0 1 0	0 0	I/O	C
XP95 Input/Output & Output Units	0 1 0	0 0	I/O	K
XP95A Mini Switch Monitor Module	0 1 0	0 1	MSMM	T
XP95A Switch Monitor Module	0 1 0	1 0	SMM	U
XP95A Switch Monitor Input/Output Module	0 1 0	1 1	I/O	W
XP95 & Discovery Ionisation Smoke Detectors	0 1 1	0 0	ION	L
Series 90 Ionisation Smoke Detector	0 1 1	0 0	ION	D
CO Fire Detector (Gaseous Fire Monitor)	0 1 1	0 1	Special	j
CO Fire Detector (Personal Protection Monitor)	0 1 1	1 0	Special	k
CO Fire Detector (Environmental Gas Monitor)	0 1 1	1 1	Special	l
Series 90 Zone Monitor Unit, S90 Control Unit Monitor	1 0 0	0 0	ZMU/ CUM	E
XP95 Zone Monitor Unit	1 0 0	0 0	ZMU	M
XP95 Mini Switch Monitor, XP95 Switch Monitor, XP95 Switch Monitor Plus	1 0 0	0 1	Special	m
	1 0 0	1 0	Special	n
XP95 Aspirating Devices	1 0 0	1 1	Special	o
XP95 & Discovery Optical Smoke Detectors & XP95 Beam Detector, Series 90 Optical Smoke Detector	1 0 1	0 0	OPT	N
	1 0 1	0 0	OPT	F
Beam Detector (Reserved)	1 0 1	0 1	Special	p
Flame Detector	1 0 1	1 0	Special	q
XP95 & Discovery Multisensor	1 0 1	1 1	Special	r
XP95 & Discovery Temperature Detectors	1 1 0	0 0	HEAT	O
Series 90 Temperature Detector	1 1 0	0 0	HEAT	G
XP95 High Temperature Detector	1 1 0	0 1	H.HEAT	Q
	1 1 0	1 0	Special	u
	1 1 0	1 1	Special	v
Series 90 Manual Call Point & Series 90 Manual Call Point Monitor	1 1 1	0 0	MCP	H
XP95A Mini Priority Switch Monitor Module	1 1 1	0 1	MPSM	v
XP95A Priority Switch Monitor Module	1 1 1	1 0	PSM	R
XP95 Manual Call Point, XP95 Mini Switch Monitor with Interrupt & Discovery Manual Call Point	1 1 1	1 1	MCP	P

Note: XP95 and Series 90 smoke and heat detectors share the same type code but are distinguished by the XP95 flag. Earlier versions of software are not fully compatible with XP95/XP95A interface units. Discovery devices are identified as XP95.