System configuration
DS90-31

DS90-31 Basic system

Basic system

DS90-31 is a powerful computer in the DS90 family. It is designed to meet the requirements of departmental computing, online transaction processing, manufacturing and communication systems. The computer is housed in a 19" rack and is completely modularised thus allowing for great flexibility in configuration and expansion.

The DS90-31 basic system comprises:

- 19" basic cabinet
- Power distribution. The system supports automatic power-fail handling provided the system is supplied through a UPS
- Central processing unit with
  - M68030 processor
  - 8 MByte primary memory with hardware parity checking, floating point unit for fast calculation and a 64 kByte cache memory.
  - A built in 5.25" floppy disk drive handling both 720 kByte and 1.2 MByte disks
  - Four V.24 asynchronous channels for terminals and printers
  - Expansion rack with six VME and two DataBoard slots
  - Three SCSI channels
- Six free cabinet positions
- D-NIX operating system for an unlimited number of users
- D-MENU, menu system and UNIX utilities

The basic system is configured together with other units to match the individual application requirements.

- **Basic system**

DIAB DATA

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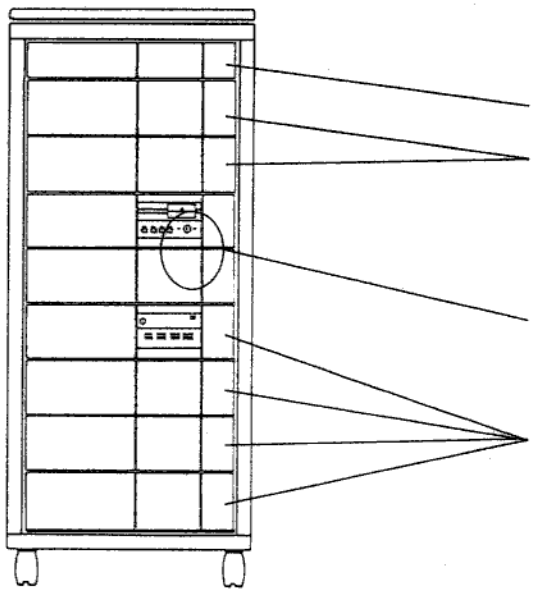
Cabinet layout

Basic cabinet

The basic cabinet has eight positions. Two positions are occupied by the DS90-31 central unit. The remaining six positions are thus available for expansion purposes.



To be used by 6250 bpi 1/2" tape system only

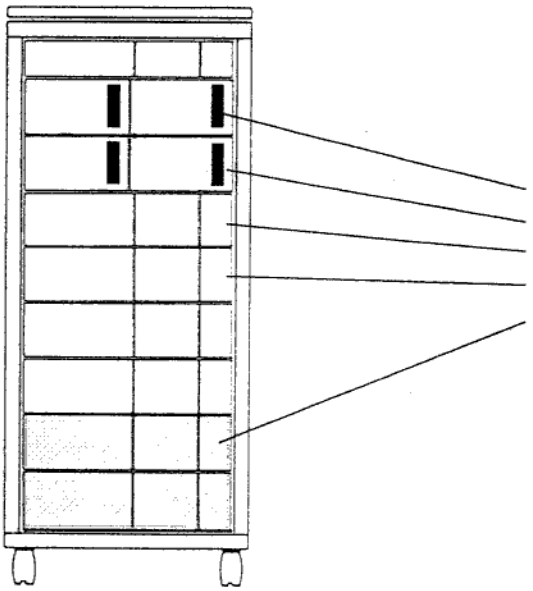
Two positions for 1/2" tape system
or
BU90R 2 GB tape backup unit
and/or
WU90R optical disk unit

Central processing unit

Four positions for DU90R/DU90RS
and/or
BU90R 2 GB tape backup unit
and/or
WU90R optical disk unit

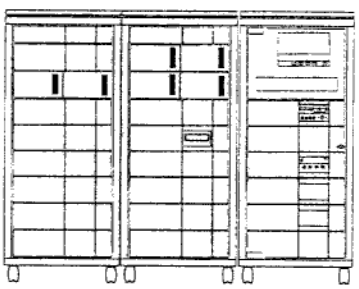
Expansion cabinet

The expansion cabinet has eight positions. DS90-31 may have two expansion cabinets. Possible cabinet equipment depends upon priority of expansion cabinet.



Unit	Exp cab 1	Exp cab 2
SU90R basic unit	Yes	No
SU90R basic unit	Yes	Yes
BU90R	Yes	No
BU90R	Yes	No
VME expansion rack	Yes	Yes

Expansion DS90-31



The expansion cabinet is placed next to the basic cabinet and the cabinets are bolted together. The DS90-31 can be expanded with two expansion cabinets.

System expansion

CPU expansion

DS90-31 can be equipped with three additional M68030 processors in order to enhance performance.

- **CPU expansion M68030, 25 MHz**

Memory expansion

Three additional memory modules can be installed. There are two different memory modules – 4 or 8 MByte. With three additional modules, primary memory becomes 32 MByte.

- **Memory expansion 4 MByte**
- **Memory expansion 8 MByte**

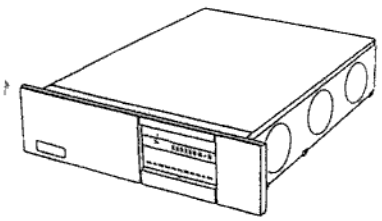
Disk expansion

Winchester disk

The disk capacity can be expanded in multiples of 150, 300 and 600 MByte (formatted data). The units occupy one cabinet position. Disk units are available with or without 60 MByte streamer.

Four units can be connected to the SCSI ports of the basic system. One unit must be equipped with streamer.

- **150 MB mass storage/60 MB streamer DU90R/150S**
- **300 MB mass storage/60 MB streamer DU90R/300S**
- **600 MB mass storage/60 MB streamer DU90R/600S**
- **150 MByte mass storage DU90R/150**
- **300 MByte mass storage DU90R/300**
- **600 MByte mass storage DU90R/600**



Mass storage DU90R

SMD disk

The SMD disk has a 1.1 GByte capacity (formatted data) and is available as basic unit (with controller) and as add-on unit (without controller). Basic unit and add-on unit are located in one 19" unit occupying one cabinet position. DS90-31 can be equipped with three such pairs.

- **SMD-disk 1.1 GB basic unit SU90R (w/ctrl)**
- **SMD-disk 1.1 GB add-on unit SU90R (wo/ctrl)**

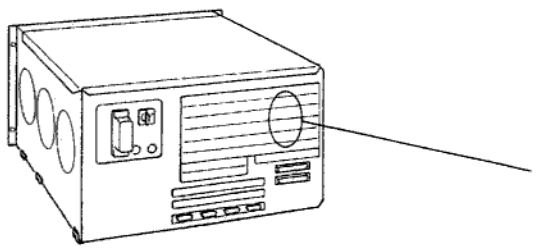
Asynchronous channels

The number of asynchronous channels can be expanded with terminal boards and/or terminal concentrators.

Terminal board

The terminal board 4xV.24 has four channels which are directly controlled by the main CPU. The terminal expansion is installed directly on the mother board. The central unit accepts two additional terminal boards.

- **Terminal board 4xV.24**



Terminal concentrator

The terminal concentrator 10xV.24 has ten channels and a dedicated CPU thereby off-loading the main CPU.

The terminal concentrator occupies one of six VME slots available in the central processing unit or can be installed in a VME expansion rack.

- **Terminal concentrator 10xV.24**

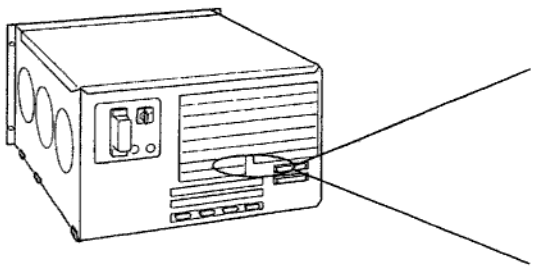
Communication

Ethernet kit

The Ethernet kit includes TCP/IP software and an Ethernet board. Transceivers and cables are not included.

An Ethernet kit occupies one of two DataBoard slots in the central processing unit.

- **Ethernet kit**



Communication kit

A communication kit is used for synchronous and X.25 communication.

A communication kit occupies one of two DataBoard slots in the central processing unit.

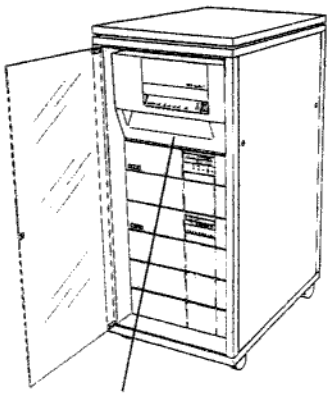
- **Communication kit**

Backup units

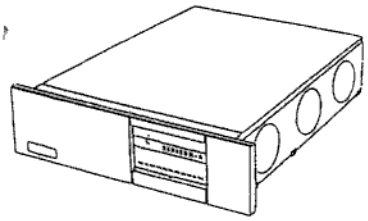
1/2" tape system

Backups can be performed with a 1/2" tape system. A VME controller is included. The VME controller occupies one of six slots in the central processing unit. The tape system is mounted at the top position of the cabinet.

- **1/2" tape system 1600 bpi**
- **1/2" tape system 1600/3200 bpi**
- **1/2" tape system 1600/3200/6250 bpi**



1/2" tape system



Backup unit 2 GByte BU90R / optical disk WU90R

Backup unit 2 GByte

A tape backup unit 2 GByte stores 2 GByte on a standard tape cassette. The unit occupies one cabinet position.

Seven backup units 2 GByte can be connected to the SCSI ports of the basic unit.

- **Tape backup unit 2 GByte BU90R**

WORM optical disk

A WORM disk is an optical disk for permanent data storage. Written data cannot be erased. The exchangeable disk stores 390 MByte on each side. The unit occupies one cabinet position.

Five optical disks can be connected to the SCSI ports of the basic unit.

- **Optical disk WU90R**

Configuration recommendations

Below are some guidelines as to how the DS90-31 can be expanded with memory and extra CPUs in various applications. Configuration may vary depending on the number of users and the applications running in the system.

A normal user is defined as an office automation or communication user.
A heavy user is defined as a database or 4GL application user.

Memory	Number of users	Number of heavy users	Extra CPUs
8 Mb	1 - 20	1 - 10	-
12 Mb	21 - 40	11 - 20	-
16 Mb	41 - 60	21 - 30	1
20 Mb	61 - 80	31 - 40	2
24 Mb	81 - 100	41 - 50	2
28 Mb	101 - 120	51 - 60	3
32 Mb	121 -	61-	3

Typical configurations

Below are some typical DS90-31 configurations. It is assumed that the larger configurations include Ethernet and mainframe communication. DS90-31 is not limited to these configurations.

Asynchronous channels	12	24	32	48	72	92	144
Terminal boards 4xV.24	2	-	2	1	2	2	-
Terminal conc 10xV.24	-	2	2	4	6	8	14
Memory (MByte)	8	8	8	8	8	8	8
Memory expansion (MByte)	-	4	8	12	16	20	24
CPU expansion	-	-	1	1	2	2	3
Disk (MByte)	150	300	300	300	600	600	600
Streamer (MByte)	60	60	60	60	60	60	60
Disk expansion (MByte)	-	-	150	300	300	600	-
SMD disk 1,1 GByte	-	-	-	-	-	2	6
Backup unit 2 GByte	-	-	1	1	1	1	2
Communication kit	-	-	-	1	1	1	1
Ethernet kit	-	-	1	1	1	1	1
Expansion cabinet	-	-	-	-	-	1	2

Configuration DS90-31

Configuration of DS90-31 is performed in three steps:

Step 1 – Checking actual requirements

This step allows you to check if the DS90-31 is the right system for your application. Here you will compare your actual requirements with the expansion limits of the DS90-31. If OK, continue configuration with step 2.

Step 2 – Detail configuration

A detail configuration of all components involved to meet your requirements. This specification is performed in a number of groups related to the kind of requirement. (terminal connections, secondary memory, etc).

Step 3 – Configuration check

Certain parameters of the computer system 'conflict' with each other as concerns space and system support. A configuration check has to be performed to avoid problems in this area.

Step 1 – Checking actual requirements

The actual requirements are taken from the application in question based on the configuration examples given in the recommendation table in this guide. This step will give you a rough idea as to the feasibility of the DS90-31 for your application.

Parameter	Basic requirement	Max for DS90-31
CPU power		1+3 processors
Primary memory		32 MByte
V.24 ports		262
Comm ports		4
Ethernet ports		1
Mass storage		9000 MByte
Backup units		8000 MByte

If your requirements are within the DS90-31 maximum specifications, then continue with step 2.

Step 2 – Detail configuration

The detail specification is done in steps corresponding to the parameters given in step 1. Follow the order as below and enter the fields one by one to configure the system. But first, please read the previous pages.

When you are ready with this step, move all information denoted thus ▶ to the configuration check section. Follow the directions there to verify your configuration.

❶ Basic system

Art No	Description	Number
001-7172-0X	DS90-31 Basic cabinet	1
One basic system is always requred		1

❷ CPU expansion

Art No	Description	Number
002-1130-02	CPU expansion M68030	
Select a maximum of three units from this list		

❸ Memory expansion

Art No	Description	Number
002-2020-3X	Memory expansion 4 MByte	
002-2022-0X	Memory expansion 8 MByte	
Select a maximum of three units from this list		

❹ V.24 ports

Terminal board

Art No	Description	Number
002-5172-10	Terminal board 4xV.24	
Select a maximum of two units from this list		

Terminal concentrator

Art No	Description	Number
001-7153-20	Terminal concentrator 10xV.24	
Select a maximum of 25 units from this list		1 ▶

❺ Communication

Art No	Description	Number
001-7095-X0	Communication kit (2 max)	
001-7098-X0	Ethernet kit (1 max)	
Select a maximum of two units from this list		

❻ Mass storage units

Disk/streamer DU90R/S

Disk DU90R

Art No	Description	Number
001-7136-26	Mass storage 150 MB/60 MB str DU90R/150S	
001-7136-28	Mass storage 300 MB/60 MB str DU90R/300S	
001-7136-29	Mass storage 600 MB/60 MB str DU90R/600S	
001-7135-26	Mass storage 150 MB DU90R/150	
001-7135-28	Mass storage 300 MB DU90R/300	
001-7135-29	Mass storage 600 MB DU90R/600	
A maximum of four units from this list (one streamer is required)		4

SMD disk SU90R

Art No	Description	Number
001-7148-00	SMD disk 1.1 GByte w/ctrl (3 max)	2
001-7149-00	SMD disk 1.1 GByte wo/Cctrl (3 max)	
Select a maximum of six SMD disks (Each 7149 requires one 7148)		

❼ Backup units

Backup unit BU90R, optical disk WU90R

Art No	Description	Number
001-7142-00	Backup unit 2 GByte BU90R	6
001-7139-00	Optical disk WU90R (5 max)	5
Select a maximum of seven units from this list		

1/2" tape system

Art No	Description	Number
012-7104-00	Tape system 1/2" 1600 bpi	
012-7104-01	Tape system 1/2" 1600/3200 bpi	
012-7104-02	Tape system 1/2" 1600/3200/6250 bpi	
Select a maximum of one unit from this list		3

Continue with step 3 – configuration check!

❽ Expansion cabinets

Art No	Description	Number
001-7164-20	Expansion cabinet	
Select a maximum of two expansion cabinets		

Steg 3 - Configuration check

The following parameters must be checked when configuring the DS90-31 system:

- number of VME rack slots required
- number of cabinet positions for disk units etc
- number of cabinets

The result of the configuration check might be that further units must be included in the system or that the configuration is invalid due to a unit conflict. In such a case, make a new configuration where you should choose a different mix of units or a different system solution.

Number of VME slots required

Enter the information obtained in the detail configuration (figure by figure) in the table below:

1	Terminal concentrators	
2	SMD disks with controllers	
3	1/2" tape systems	
	Total number of VME slots	

Check 1

If the total number of VME slots exceeds 25, the configuration is invalid. Try to reduce number of VME slots by:
- o replacing SU90R SMD disks with DU90R winchester disks,
- o replacing 1/2" tape system with BU90R backup unit,
- o replacing terminal concentrator with terminal boards.

Check 2

If the total number of VME slots exceeds 24 and 2 is 3, the configuration is invalid. Make a new configuration where you should try to:
- o replace SU90R SMD disks with DU90R winchester disks,
- o replace 1/2" tape system with BU90R backup unit,
- o replace terminal concentrator with terminal boards .

Check 3

If the total number of VME slots exceeds 15 you will need two expansion cabinets 001-7164-20. Return to this product in the detail configuration and enter required number of cabinets.

Check 4

If the total number of VME slots exceeds six you will need one expansion cabinet 001-7164-20. Return to this product in the detail configuration and enter required number of cabinets.

Number of cabinet positions for disk units, etc

Enter the information obtained in the detail configuration (figure by figure) in the table below:

4	DU90R units	
5	WU90R units	
6	BU90R units	
	Total number of cabinet positions	

Check 1

If the detail configuration comprises one 1/2" tape system, the total number of cabinet positions may not exceed six. If so, the configuration is invalid.
Make changes by trying to:
- o replace DU90R with SU90R,
- o replace 1/2" tape system with BU90R backup unit.

Check 2

If the detail configuration does not comprise one 1/2" tape system, the total number of cabinet positions may not exceed eight. If so, the configuration is invalid.
Make changes by trying to:
- o replace DU90R with SU90R.

Check 3

If the detail configuration comprises one 1/2" tape system, the sum of 4 and 5 must not exceed four. If so, the configuration is invalid.
Make changes by trying to:
- o replace DU90R with SU90R,
- o replace 1/2" tape system with BU90R backup unit.

Check 4

If the detail configuration does not comprise one 1/2" tape system, the sum of 4 and 5 must not exceed six. If so, the configuration is invalid.
Make changes by trying to:
- o replace DU90R with SU90R.

Check 5

If the total number of SU90R disk units exceeds two, then two expansion cabinets 001-7164-20 have to be ordered. Return to detail configuration and enter required number of cabinets.

Check 6

If the total number of SU90R disk units exceeds zero, then one expansion cabinet 001-7164-20 has to be ordered. Return to detail configuration and enter required number of cabinets.

Number of cabinets

Enter the information from the detail configuration (figure by figure) below:

2	SU90R disk units with controllers	
	Total	

Check 1

If the total number of SU90R disk units exceeds two, then two expansion cabinets 001-7164-20 have to be ordered. Return to detail configuration and enter required number of cabinets.

Check 2

If the total number of SU90R disk units exceeds zero, then one expansion cabinet 001-7164-20 has to be ordered. Return to detail configuration and enter required number of cabinets.

PLEASE NOTE!

Select the highest number of expansion cabinets as obtained in any one of the check points.
Example 1: One check indicates that you will need two expansion cabinets, another check indicates one cabinet. Order two expansion cabinets.
Example 2: One check point indicates that you will need one expansion cabinet, another check also indicates a need for one expansion cabinet. Order one cabinet.