Siemens

WF 470
Video Display Module

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1 Application

The automation of manufacturing equipment cannot completely prevent disruption to the process caused by faults and breakdowns. The efficiency and profitability of a plant is heavily dependent on its availability. It is therefore essential that faults are quickly and accurately located and then displayed to the relevant personnel, so that machine down time is kept to a minimum.

The WF 470 is a diagnostics and display system designed for this purpose. It is one part of a range of intelligent peripheral modules which may be used in conjunction with SIMATIC S5 programmable controllers. The WF 470 module is directly connected to its colour monitor. The module has its own "on board" micro-processor and memory, allowing it to construct, to store and to display process pictures.

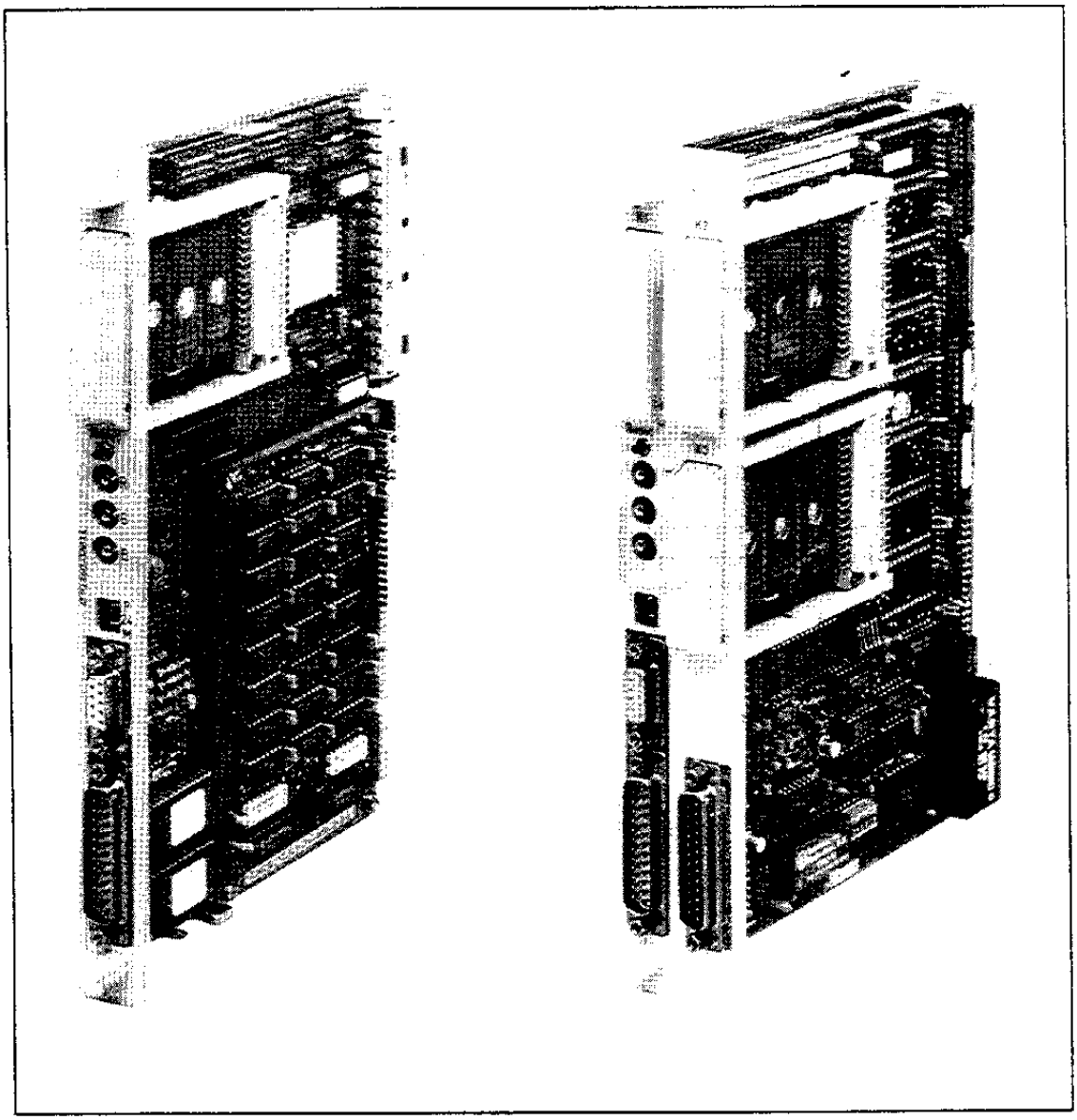


Fig 1.1 WF 470 A.

Fig. 1.2 WF 470B/C Two additional slots for memory submodules, second serial interface port for printer-/computer link)

The WF 470 can automatically provide information about the

- Type of fault
- Location of the fault
- Cause of the fault
- Remedy of the fault

The WF 470 has additional options for the display of sequence information and service data. The sequence analyser option is used to monitor and display the condition of the sequence programs' inputs, outputs, and flags etc. in the PLC. The service module allows PLC status information to be displayed without the need to connect a programming unit.

The WF 470 can also simplify the start-up and operation of a machine. The machine start sequence and operating modes can not only be displayed graphically but also in descriptive text. The interaction of the operating personnel with the production machinery is thereby also improved.

Main features of the WF 470:

- The pictures and text fields are constructed using a PG 675, PG 685 or PG 750 programming unit, which provides user-friendly softkey operation with full help texts and prompting.

- The good range of graphical and text functions available permit clear and accurate mimics of the machines and processes to be produced.

- The pictures and texts are stored and controlled by the module, thus releasing the SIMATIC PLC to perform the control task.

- Error messages and status reports can be output directy from the WF 470 module to a printer or supervisory computer.

- Sequence programs running in the PLC can be monitored and their status displayed on the WF 470 screen and printer.

The process mimic pictures and data displays are constructed from the following elements. Each element can be magnified up to a factor of 16 times normal size independently in both the X and Y directions. Eight different fore- and background colours may be used.

- Individual symbols

  - 128 pre-defined symbols
  - 128 further user-definable symbols
  - ASCII character set

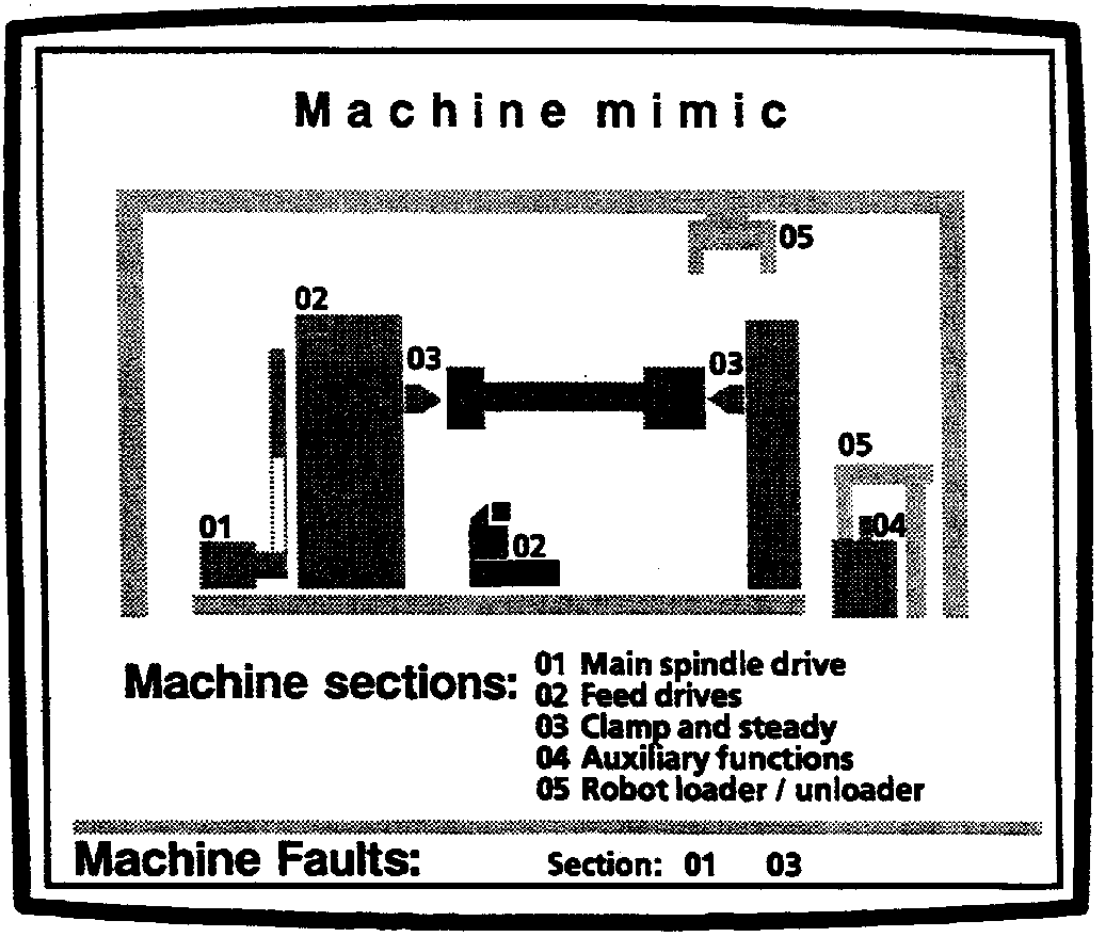
- Composite symbols (Any combination of individual symbols)

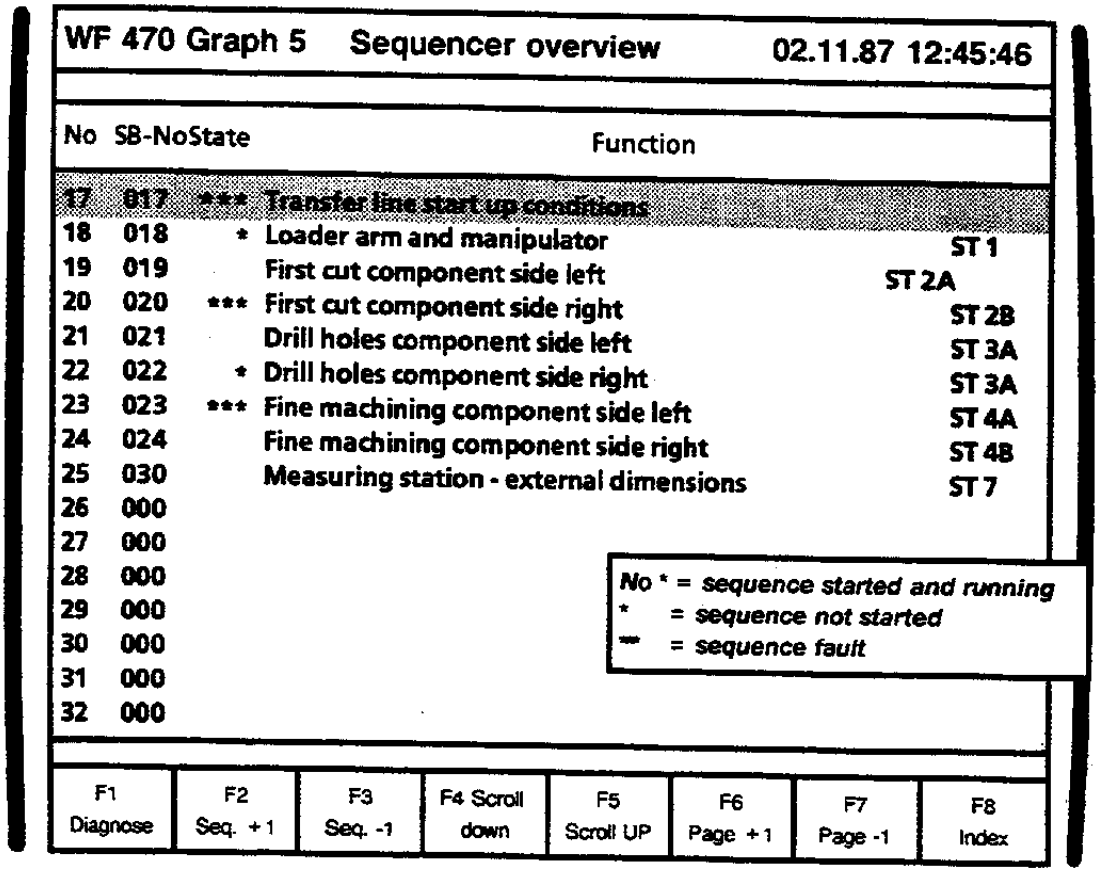
- Text display windows

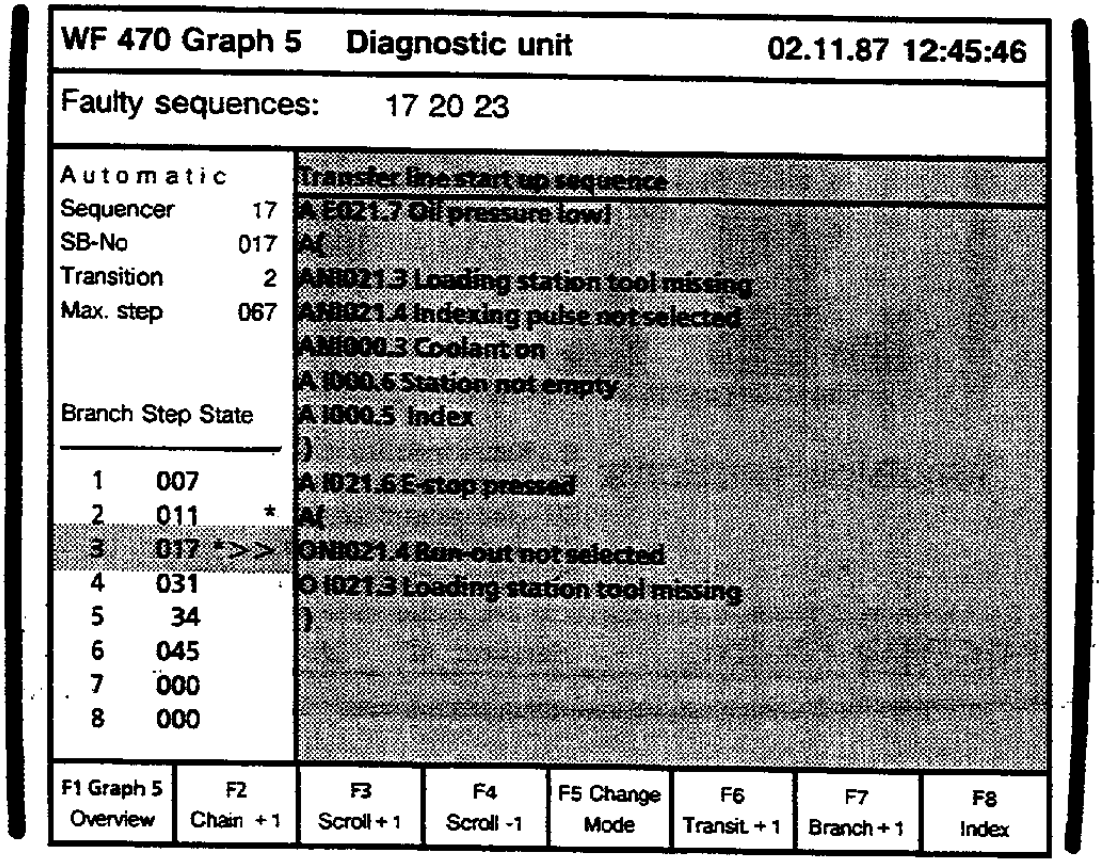
  - Static text, the colour is changed by control bits in the PLC
  - Dynamic text with scroll and push-up, displayed only when the control bits are high.

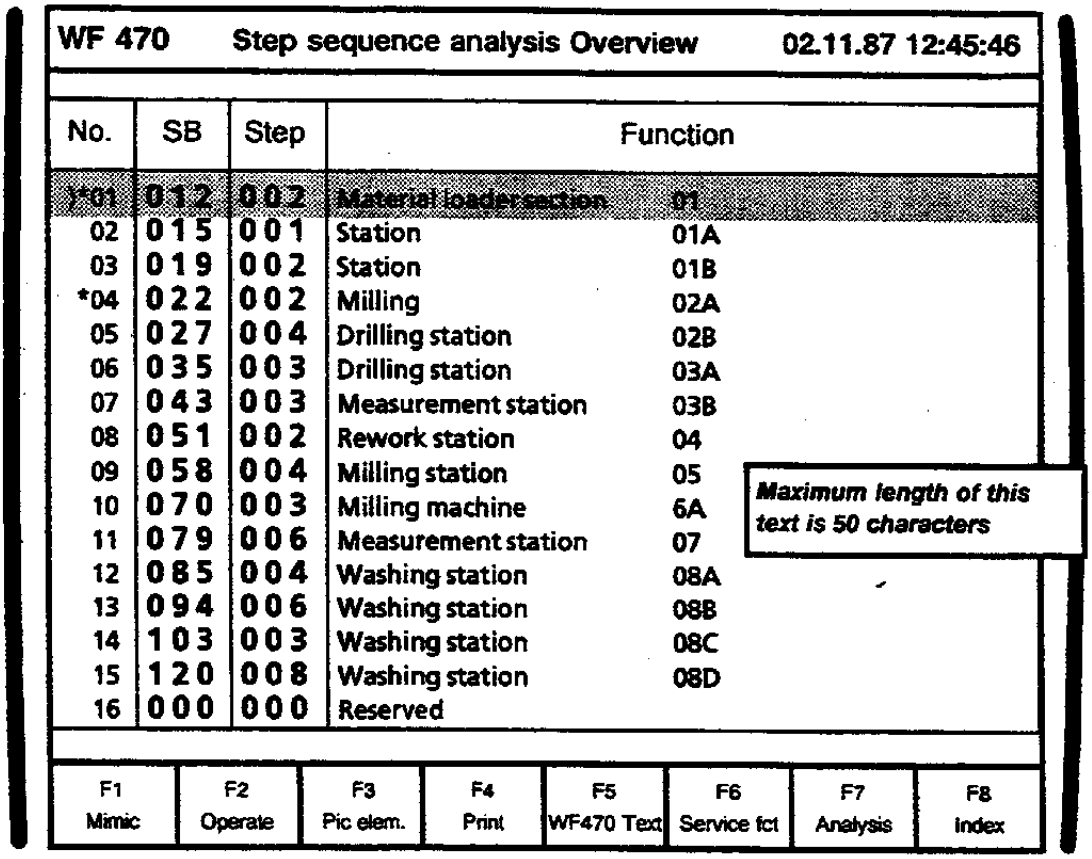
- Variable fields
  - Process data entry
  - Process data entry and display
  - Process data display
  - Comment text
  - date
  - time
- Bar graphs, which allow the following to be defined:
  - size (vertical,horizontal) to pixel resolution
  - Direction of increase
  - Colour zones (up to 8)
  - Width
  - Height

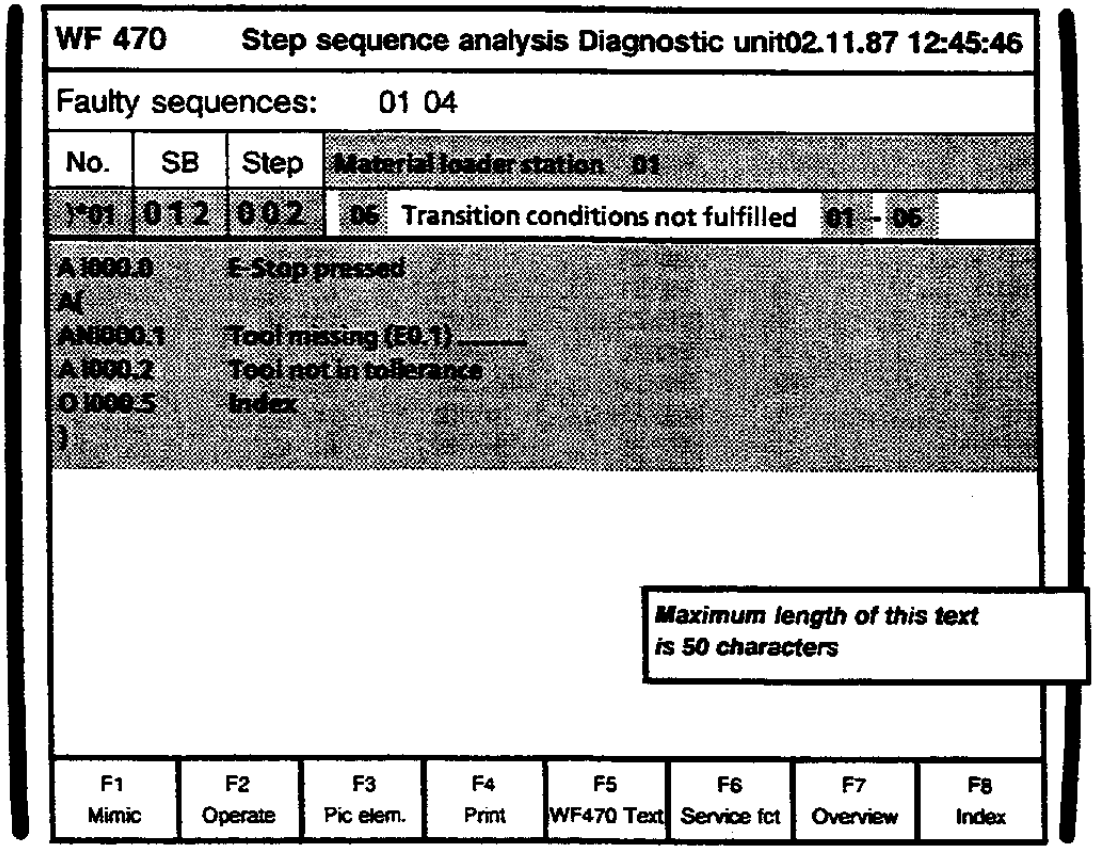
Examples of typical pictures and data displays are produced on the following pages.
The WF 470 Brief Description leaflet contains further colour reproductions of typical WF 470 pictures.











WF 470 Service module

CONTROL		n/DL	n+1/DR	HEXA	DEC	
IW	000	0000 0110	1100 0000	06C0	01728	
QW	000	1000 0100	1100 0000	84C0	33984	
FW	100	0000 0001	0000 0000	0100	00256	
C	005	0000 0000	0000 0000	0000	0000	
T	102	0000 0000	0000 0000	0000	0000	100ms
PW	129	1111 1111	1111 1111	FFFF	65535	
DB	030					
DW	001	0000 0000	0000 0001	0001	00001	
DW	002	0000 0000	0000 0101	0005	00005	
DW	003	0100 1000	0010 0000	4820	18464	

WF 470 service module option

1=Input word (IW) 2=Output word (OW) 3=Flag word (MW)
4=Counter (C) 5=Timer (T) 6=Periphery (PW)
7=DB number (DB) 8=DW number (D1) 0=Delete

F1 Mimic	F2 Operate	F3 Pic elem.	F4 Print	F5 Characteris.	F6 Free	F7 Sequence	F8 Index

LOAD AXIS (AXIS 1) — **Machine data**

MACHINE DATA INPUT/OUTPUT — ⇒ Fault ⇐

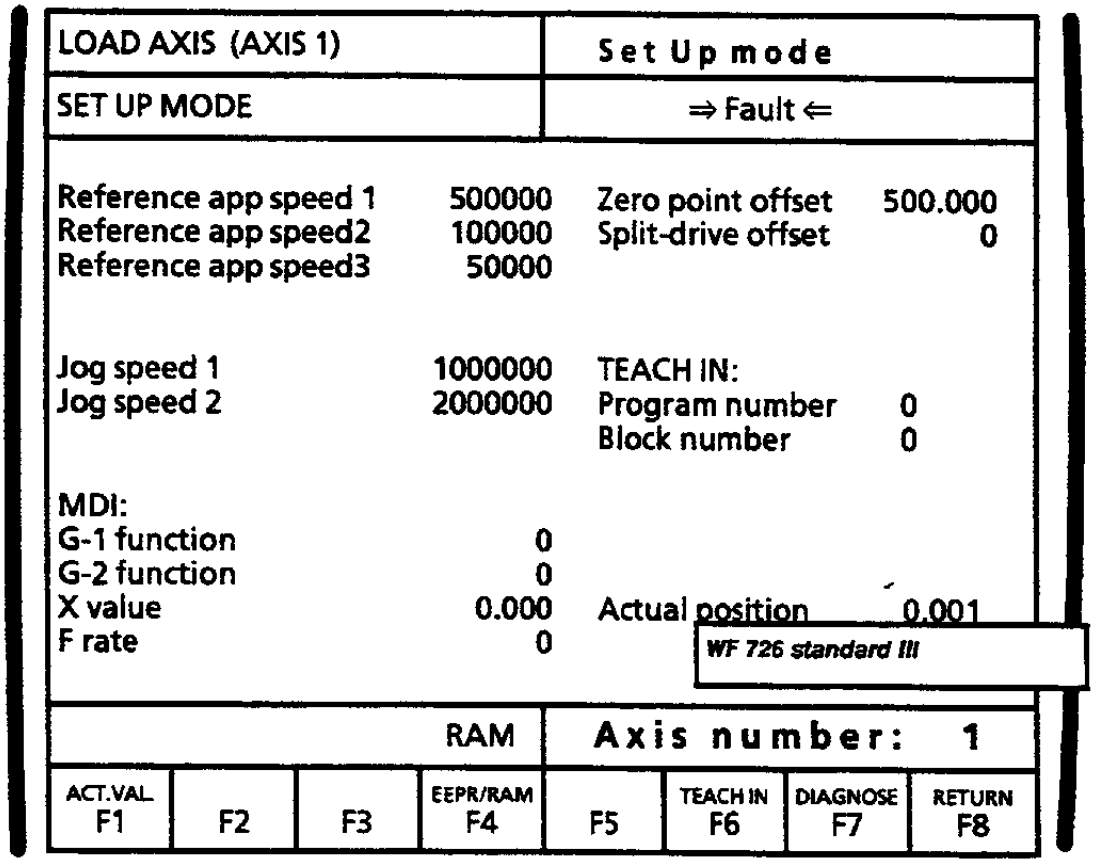
MD 1	5000	MD 17	0	MD 33	0.200
MD 2	6000	MD 18	1	MD 34	2000
MD 3 ..	30000.00	MD 19	1	MD 35	0.000
MD 4	1	MD 20	0	MD 36	0
MD 5 ...	0	MD 21	2	MD 37	0
MD 6	0	MD 22	1.00	MD 38	0.00
MD 7	1	MD 23	9000	MD 39	0.00
MD 8	100	MD 24	40.000	MD 40	0
MD 9	1	MD 25	0.100	MD 41	0
MD 10...	0	MD 26	26.000	MD 42	0
MD 11...	-1000.000	MD 27	0	MD 43	0
MD 12...	-1100.000	MD 28	1.111	MD 44	0
MD 13...	2100.000	MD 29	0	MD 45 ...	0.000
MD 14...	2110.000	MD 30	1 0000	MD 46 ...	0.000
MD 15.....	2	MD 31	.000		
MD 16...	1.000	MD 32	0.100		

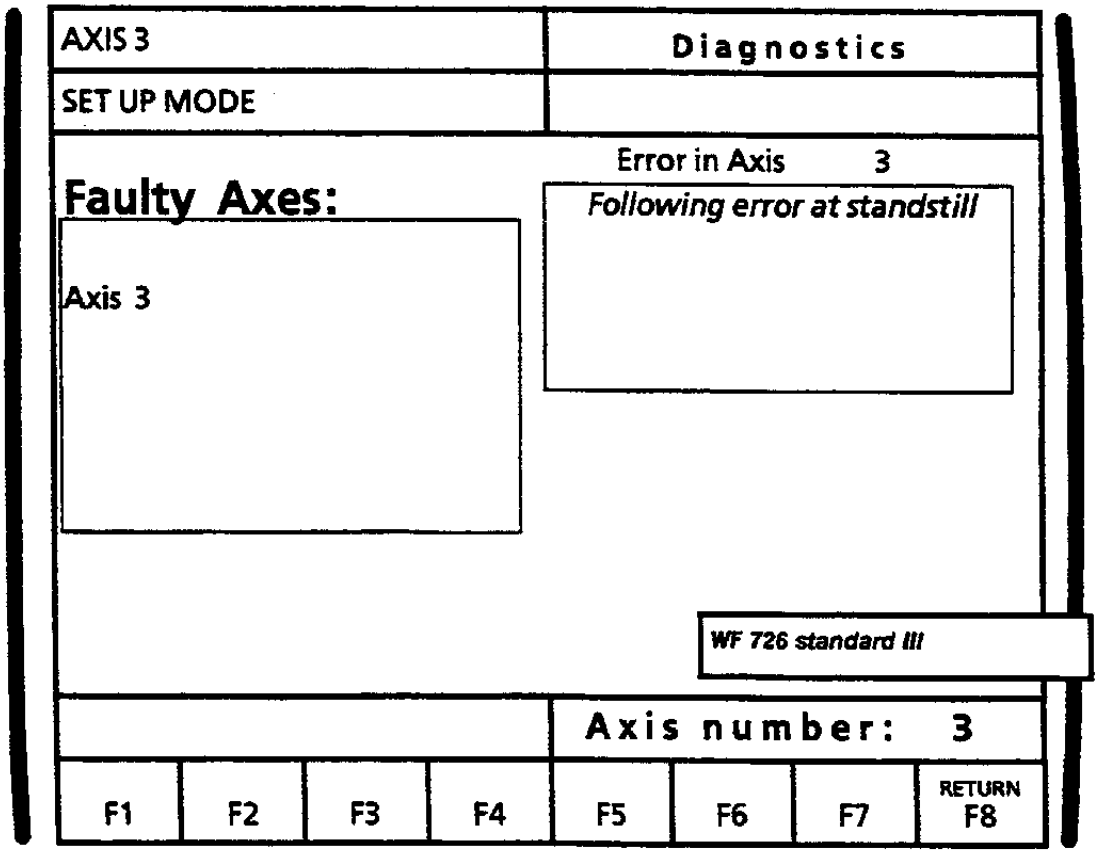
WF 726 standard III

MD 49 ... 1

RAM — **Axis number: 1**

F1	F2	F3	EEPR/RAM F4	F5	F6	DIAGNOSE F7	RETURN F8





2 Hardware

2.1 System configuration

The WF 470 module resides in the SIMATIC programmable controller rack and is bus-coupled to the central processor. The following units are connected directly onto the WF 470 module.

- Colour monitor
- Logging printer
- Picture construction system (PG 675/PG 685/PG 750 and printer; only required during picture construction and editing)

The operator keyboard can be connected normally via SIMATIC inputs and outputs and/or serially directly onto the WF 470. The complete configuration is shown below:

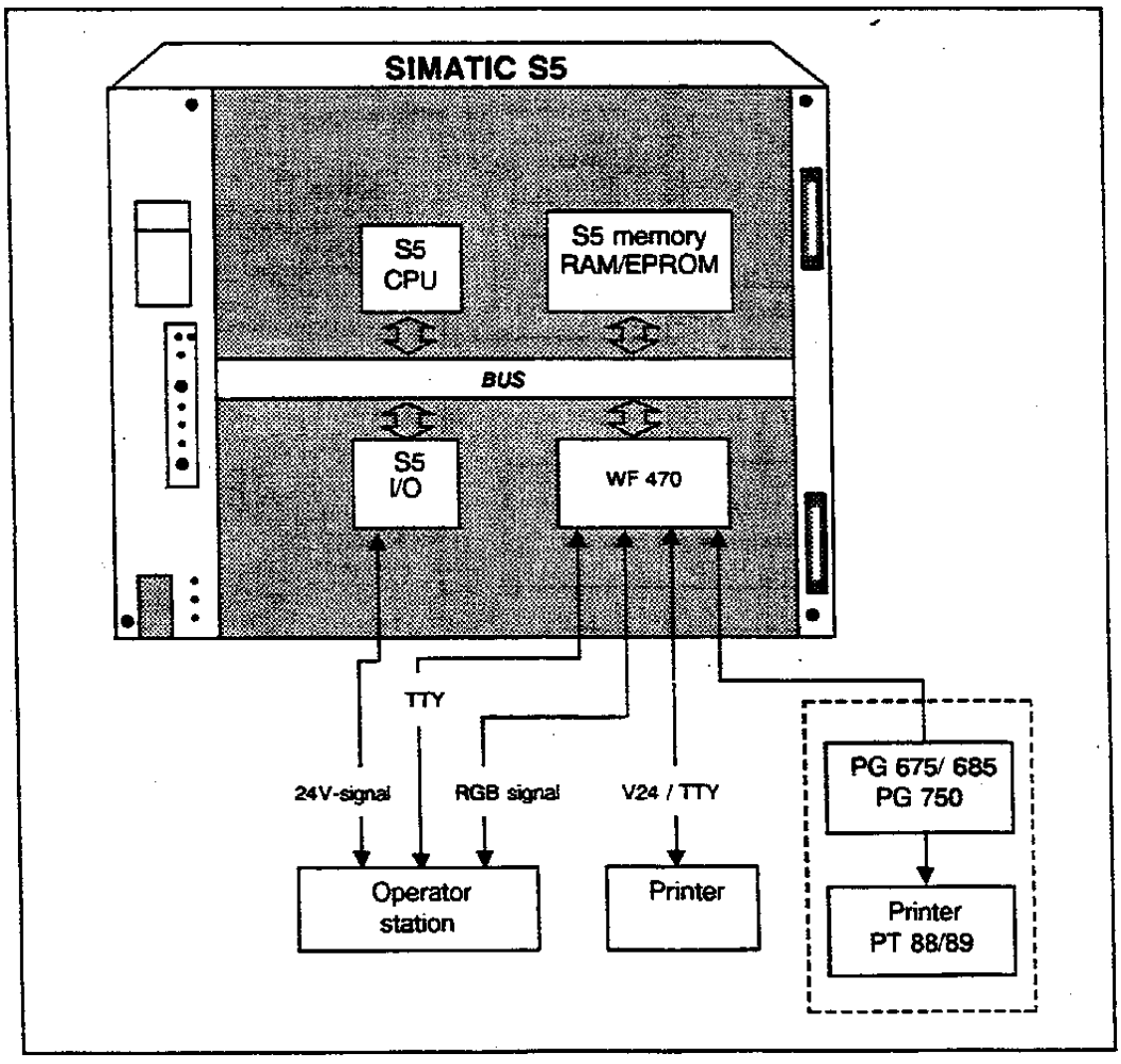


Fig. 2.1 WF 470 system configuration.

2.2 WF 470 hardware

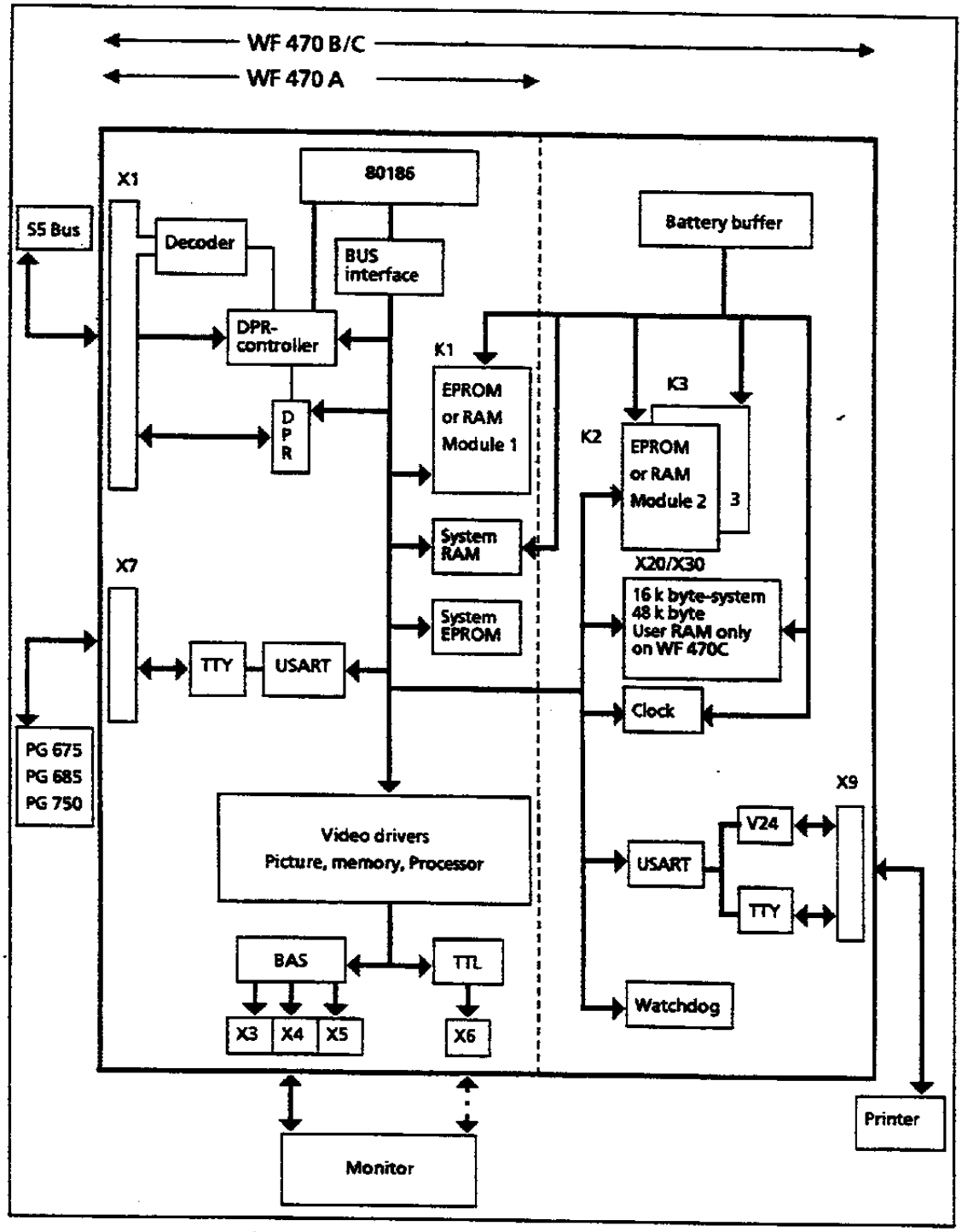


Fig 2.2 WF470 A, WF470 B, WF470 C Hardware block diagram.

When using a WF 470 B, a RAM module should be plugged into the third slot K3. Of this RAM, there will then be 8 Kbyte used by the system. This RAM is not necessary when the WF 470 pictures are simple and do not display a large amount of data, and when the printer function is not going to be used.

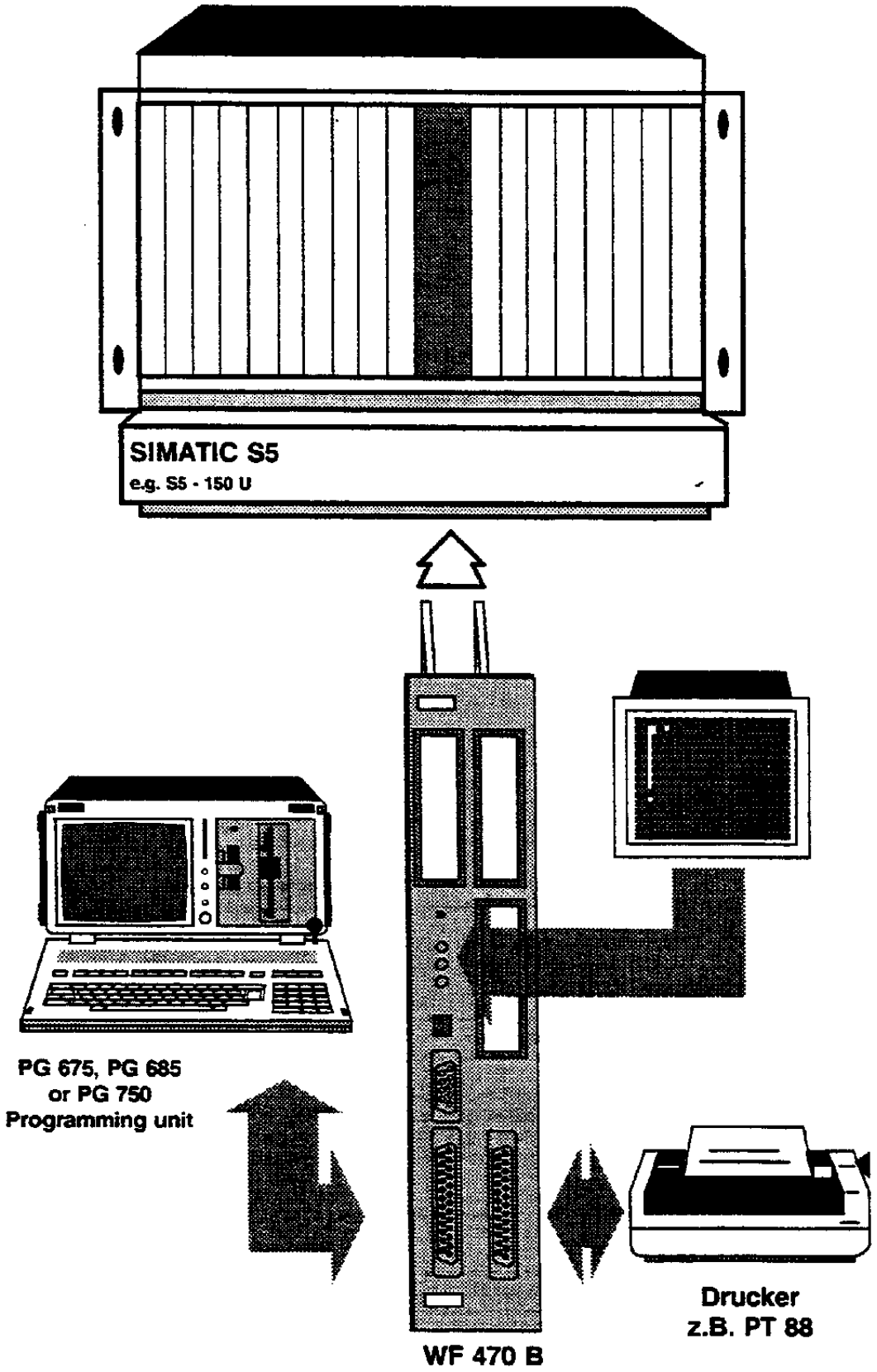


Fig. 2.3 Hardware configuration.

Technical Data

	WF 470 A Monochrome	WF 470 A Colour
Microprocessor	For picture construction, data processing, hardware interface control	
Operating System	RMOS real time operating system	
Operating System Memory	2 × EPROM 27512 (128 K byte) 16 K byte RAM as internal workspace	
User Memory RAM- or EPROM Module	1 slot memory capacity max. 128 K byte	1 slot memory capacity max. 128 K byte
Time Generation	Software clock	Software clock
Interfaces - **link to SIMATIC S5** - **BAS Outputs** - **TTL Monitor**	Via Dual Port RAM, 256 byte RGB, frame and line sychronisation; Theoretical maximum cable length: 400 m maximum cable length: 2,5 m	
Serial Interface for PG 675, PG 685 and PG 750	X	X
Serial Interface for printer	-	-
SIMATIC S5 PLC's	115U, 135U, 150U, 155 U, 130W(B)	
Power Supply	Via SIMATIC S5-bus; Power supply 5 V DC	
Current Requirement	2.5 A	2.5 A
Dimensions	Single slot width	Single slot width

	WF 470 B Monochrome	WF 470 B Colour	WF 470 C Colour
Microprocessor	For picture construction, data processing, hardware interface control		
Operating System	RMOS real time operating system		
Operating System Memory	2 × EPROM 27512 (128 Kbyte) 16 Kbyte RAM used as internal workspace		
User Memory RAM- or EPROM-Module	3 slots memory capacity max. 3x128 K byte	3 slots memory capacity max. 3x128 K byte	3 slots memory capacity max. 3x128 K byte and 48 K byte RAM on the module
Time Generation	Hardware clock	Hardware clock	Hardware clock
Interfaces - **link to SIMATIC S5** - **BAS-Output** - **TTL-Monitor**	Via Dual Port RAM, 256 byte RGB, Theoretical maximum cable length:400 m Maximum cable length: 2.5 m		
Serial Interface for PG 675, PG 685 and PG 750	X	X	X
Serial Interface for printer	X	X	X
SIMATIC S5 PLC's	115U, 135U, 150U, 155 U, 130W(B)		
Power Supply	Via SIMATIC S5-bus; supply voltage 5 V DC		
Current Requirement	3.0 A	3.0 A	3.0 A
Dimension	Double slot width	Double slot width	Double slot width

2.3 WF 470 Battery back-up buffer

The WF 470 A uses the SIMATIC S5 battery to provide the battery back up. The WF 470 B/C allows the user to select how the unit will be buffered (Fig. 2.4):

- Buffered via S5: (S2.1 closed, T-S open)
- Buffered via S5 and self-buffered (mixed): (S2.1 open, T-S closed)
- Buffered via S5 and self-buffered (joint): (S2.1 closed, T-S closed)
  This is the setting used in normal applications.

The T-S link is left OPEN when the unit is delivered from the factory, to prevent the battery from being discharged. It must be soldered in before the WF 470 is inserted in the SIMATIC rack.

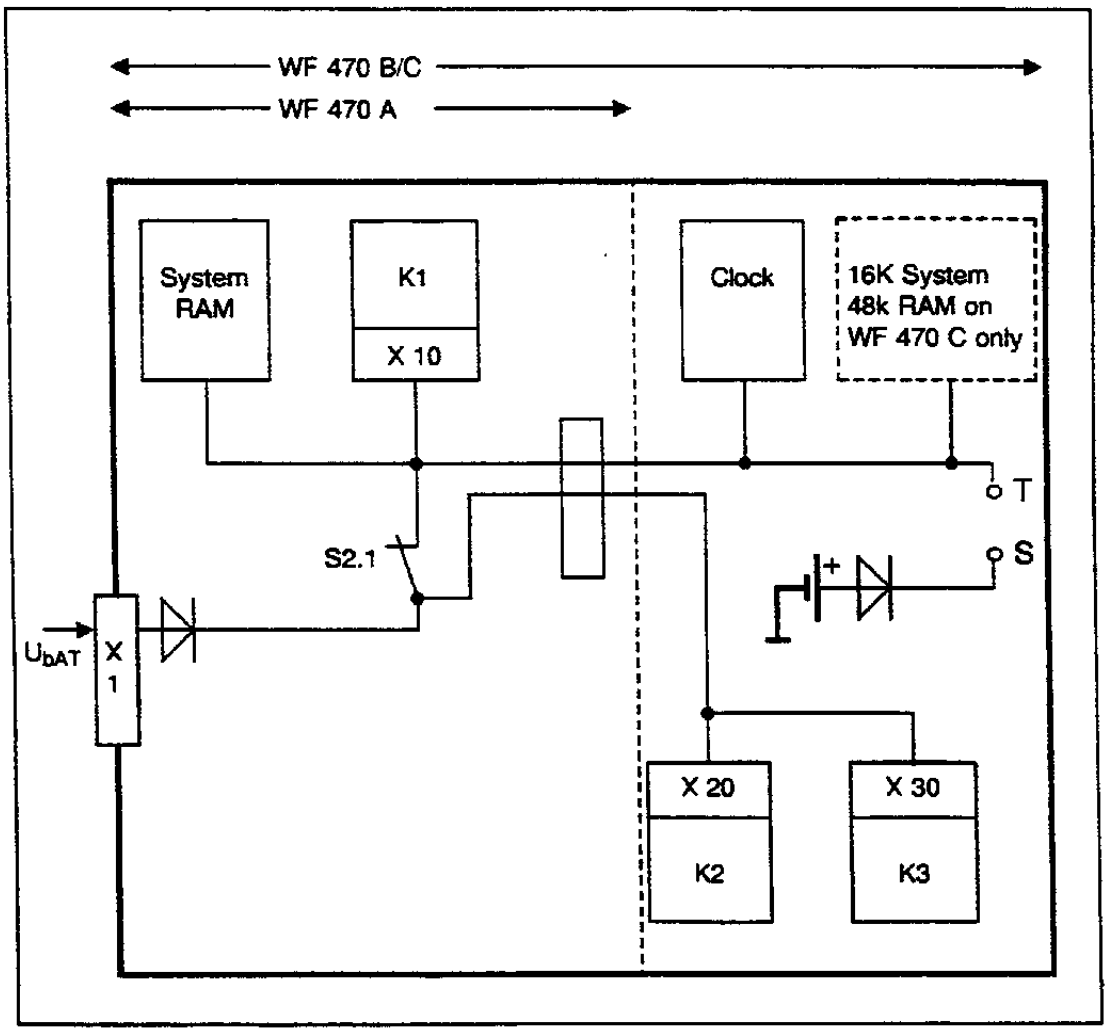


Fig 2.4 Battery back-up WF 470 A and WF 470 B/C.

2.4 Linking the WF 470 to the SIMATIC PLC

The WF 470 can operate as a

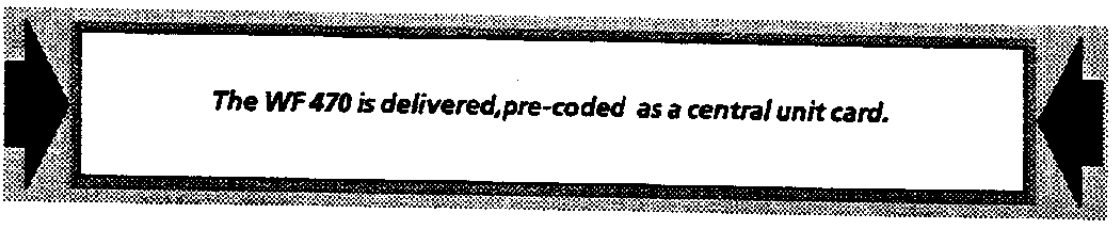
- Central unit module
- Peripheral module

The data exchange between the S5 and the WF 470 takes place via a Dual Port Ram on the WF 470 board. The Dual Port Ram acts as a memory which can be accessed from two sides, from the S5 and from the WF 470. The DPR therefore allows both partners to read from and write into the interface memory. A data transfer data block is also created in the PLC to receive data from the WF470 clock for the various option packages (sequence analyser, printer etc.).

The SIMATIC S5 Hardware treats the WF 470 like a memory module, for which the start address and size must be coded.

The module is pre-set with the following memory address and size:

- DPR Address : E000 (56×2^{10})
- DPR Size: 256 byte



2.4.1 WF 470 configured as a central unit module

When set to this mode, the WF 470 can be installed in the central rack or the extension rack. The extension rack offers the connections for the communication modules (CP connections, according to the SIMATIC catalogue). Prerequisite for this is the coupling of the extension racks via the connections AS304 - AS314.

The locations in the central rack which may be used are described in this manual in section 2.5 .

- DPR - start address: 0 to FF00 (63.75×2^{10}, see section 2.6)
  selectable in 256 byte steps
- DPR - size: 256 byte (fixed setting)

2.4.2 WF 470 configured as a peripheral module

This mode permits the module to be inserted into any peripheral slot in the central rack (see section 2.5). It can also be used in an extension rack, provided it is connected to the central rack in one of the following configurations:

CU		EU		EU	
300	→	312	→	312	(Centralised configuration)
301	→	312	→	312	(Centralised configuration)
301	→	310	→	310	(de-centralised configuration)
		300	→	312	

Expansion units which are linked via a 302-311 link cannot be used by the WF 470. The expansion unit must be fitted with a fan. The current consumption of the modules in the rack should be checked.

Provided that the above conditions are met, the WF 470 can be installed in any location in the extension unit.

The Dual Port Ram may then be coded into the analogue peripheral area (peripheral bytes 128-255) or in the expanded peripheral area (Q-bytes 0-256).

- DPR - start address: PY 128-255 (analogue section)
  OY 0-255 - (Q section)
  in steps of the DPR size
- DPR - size: 32/64/128/256 byte

The WF 470 cannot make use of the SIMATIC back-up battery when configured as a peripheral module (The WF 470B / C has its own battery - see section 2.3).

By reducing the size of the DPR, the data transfer time between the S5 and the WF 470 is increased. It is therefore recommended to set the DPR size as large as possible.

The WF 470 is normally configured as a central module.

