5 Function Blocks

The two driver blocks PBE and PRA enable the use of the two testable binary input and output modules PBE and PRA which are particulary suitable for redundant systems. The use of the two modules in the AS 235 H is outlined in the following.

The driver blocks are described in Chapter 9.3 of the Description “AS 235 System Software Variant G” (see Section 1 of the Manual).

5.1 Testable Binary Input Module (PBE) 6DS1618-8CA

In contrast to other modules from the TELEPERM M module range, the PBE module offers special hardware fault detection procedures that enable swift elimination of hardware faults.

The module may be used in a 1–out–of–1, 1–out–of–2, or 2–out–of–2 structure.

– Two binary values from two different modules are read and ORed in a 1–out–of–2 structure.
– Two binary values from two different modules are read and ANDed in a 2–out–of–2 structure.

OR and AND interconnection of the binary values must both be provided by the user during configuration.

The module fault signal (BGF) from the driver blocks may alternatively be used for routing the two binary signals to one of the two driver blocks and modules.

The following example shows a 1–out–of–2 interpretation of 16 binary values that have been read by two redundant PBE drivers:

Explanation:

PBE.EIN1	is a driver
PBE.EIN2	is the driver that is redundant to PBE.EIN1
GB.EIN1.28	PBE.EIN1 has stored 16 binary values from this address onwards
GB.EIN2.36	PBE.EIN2 has stored 16 binary values from this address onwards
BG.AUS.54	The program section below stores the ORed values from both drivers from this address onwards.
SYSTEM.BWDZ	Converts 16 or 32 values of a binary data field into a bit sequence of an analog variable.

SYSTEM.DZBW Converts a bit sequence of an analog variable with 2 or 4 bytes into 16 or 32 values of a binary data field. Both programs are explained in the Description C79000-G8076-C416.

The output values from the driver blocks are only ORed if both driver blocks are faultless. The 16 binary values from the faultless module are stored from GB.AUS.54 onwards if this is not the case.

A simultaneous fault in both modules is excluded.

```
IF NOT PBE.EIN1.BGF;
THEN;                    PBE.EIN1 is faultless
  MUX GB.EIN1;
  CALL SYSTEM.BWDZ;
  GIVE 0,28;             Convert 16 binary values into a binary number
  ;                      from GB.EIN1.28 onwards
  TAKE LA0;              Store the result in LA0
  ;
  IF NOT PBE.EIN2.BGF;
  THEN;                  PBE.EIN2 is faultless
    MUX GB.EIN2;
    CALL SYSTEM.BWDZ;
    GIVE 0,36;           Convert 16 binary values into a binary number
    ;                    from GB.EIN1.36 onwards
    TAKE LA1;            Store the result in LA1
    ;
    LA0 ODR LA1=:LA0;    OR both values, and store result in LA0
  END IF;
ELSE;                    PBE.EIN1 is faulty
  MUX GB.EIN2;
  CALL SYSTEM.BWDZ;
  GIVE 0,36;             Convert 16 binary values into a binary number
  ;                      from GB.EIN1.36 onwards
  TAKE  LA0;             Store the result in LA0
  ;
END IF;
;
MUX GB.AUS;
CALL SYSTEM.DZBW;
GIVE 0,54,LA0;           Output 16 binary values
;                        from GB.AUS.54 onwards
```

Please observe the notes regarding jumper setting that are given in the instructions for the testable binary input module (PBE), Order No. C79000-B8076-C131.

The following switch and jumper settings are required if the module is used in the AS 235/AS 235 H systems:

– Switches S1 to S4:	1	(no interrupt triggering)
– Plug–in jumper X50:	1 – 16	open
	2 – 15	open
	3 – 14	open
	4 – 13	open
	5 – 12	don't care
	6 – 11	open
	7 – 10	inserted
	8 – 9	inserted