

SIMATIC NET

IM 184 PROFIBUS Interface Module

User Description

Date July 18th, 1995

Order No. 6ES7 184-0AA00-8BA0

SINEC L2-DP

IM 184

Description for User

(PROFIBUS Interface Modul
according to DIN E 19245 Part 3)

Version:V1.0
Date: July 18th, 1995

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Subject to technical changes.

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1 Product Features

The Interface Module IM 184 is a PROFIBUS DP slave module according to DIN E 19245 Part 3. To the customer, it offers the capability for bus connection of simple applications which can be implemented quickly and simply.

The bus connection is realized with ASIC LSPM2; the matching RS485 interface is on the module with isolation. The most important settings are lead to connectors, which makes it possible to operate the module at different settings.

The module is laid out for baudrates up to 12 MBaud, and it finds them autonomously.

The present description contains the technical data and the pin assignment for the IM 184. It is based on the user description LSPM2. It is also relevant to ASIC-specific data.

2 Mechanical Concept

The interface module IM 184 provides simple connection capability to PROFIBUS DP. In addition to the ASIC LSPM2, the module in check card format also contains the entire, isolated RS485 interface, as well as LED displays for RUN, BUS-ERROR and DIAGNOSIS.

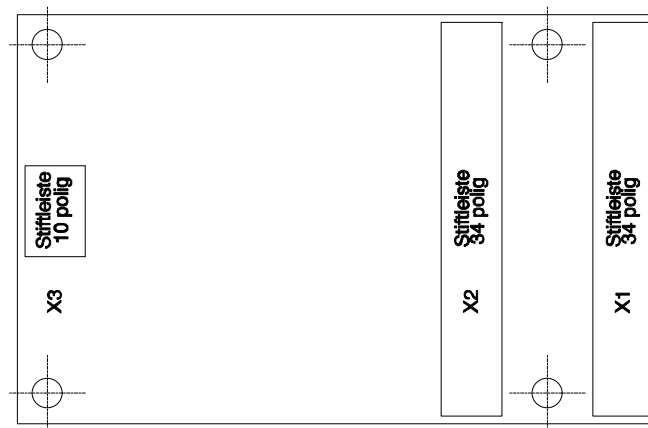
The mechanical diagram of the module is shown in Figure 1.

The size of the module is approx. 85 x 64 qmm. For mounting the module, 4 holes of 3.2mm are provided.

It is connected to the host with two 34-pole plug connectors, as well as with a 10-pole plug connector (stationary) for RS485. As an alternative, ribbon cables can be inserted here or a direct insertion (face to face) can be made. A shield terminal is not provided for; the user has to connect it directly at the 9-pole SUB-D connector.

The printed board is mounted with components on both sides (solder side only with SMD components).

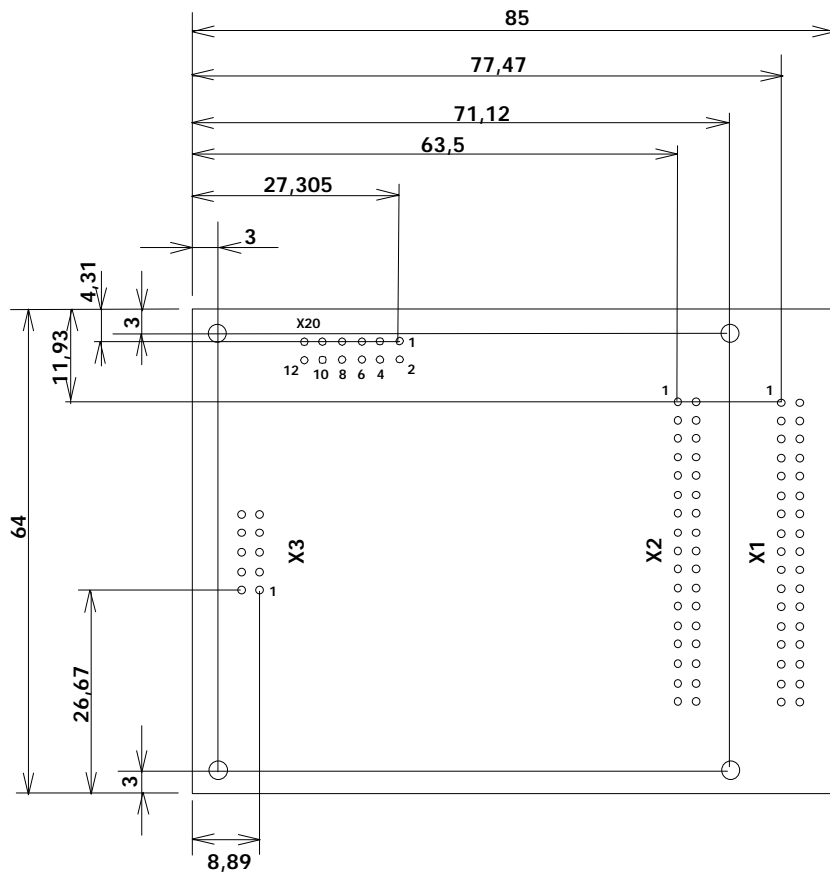
The EEPROM is plugged into a DIP8 socket.



transl. of terms: **Stiftleiste** = plug connector}

- Figure 1 -

Dimensioned Drawing



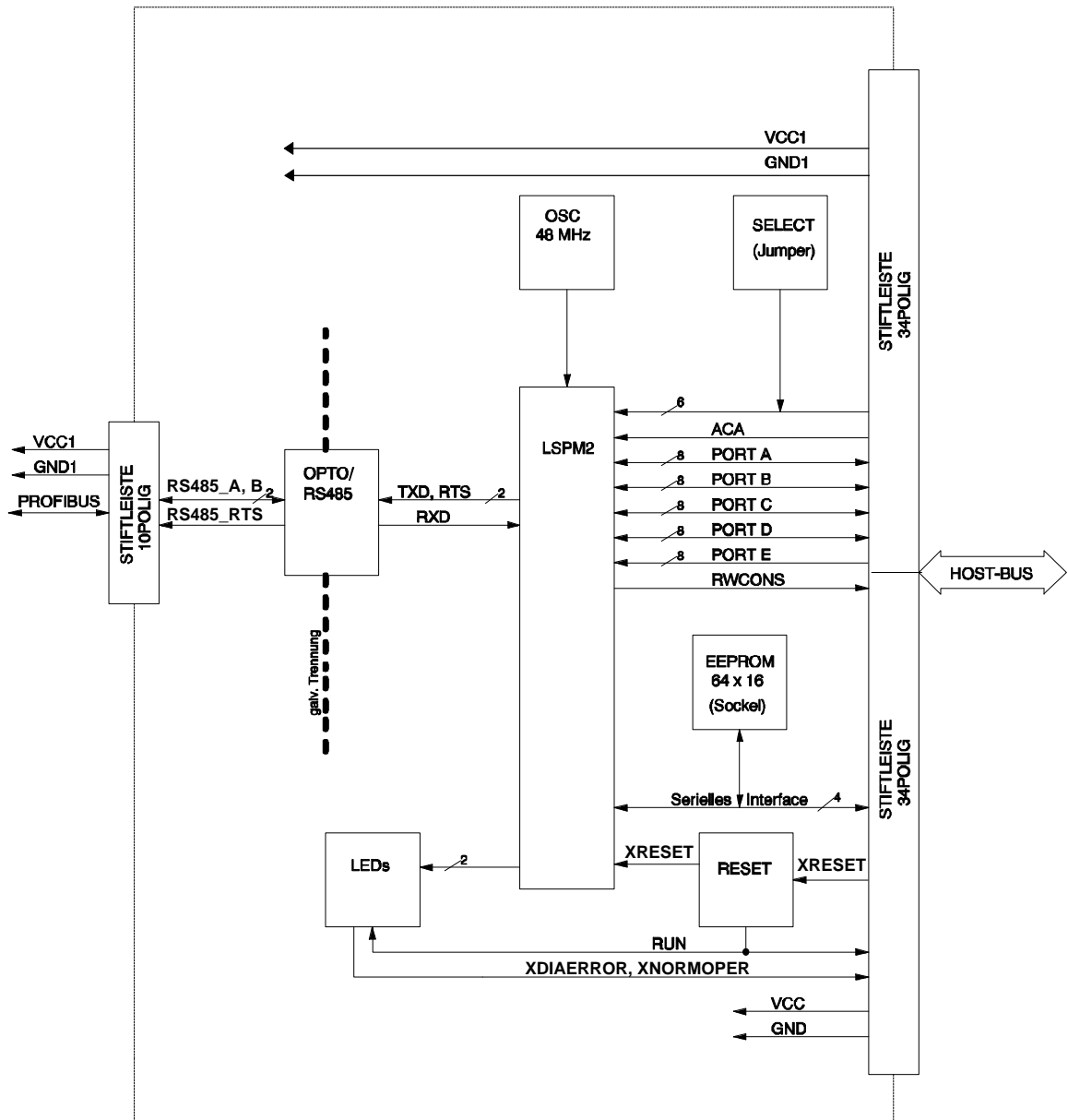
All measurements in mm.

- Figure 2 -

The pin spacing of the plug connectors is 2.54 mm. The hole diameter of the 4 mounting holes is 3.2mm.

3 Function

3.1 Block Diagram



Transl. of terms: **Stiftleiste** = plug connector; **Socket** = base; **Serielles Interface** = serial interface; **galv. Trennung** = isolation}

- Figure 3 -

3.2 Function Description

The following functionality is implemented on the module:

- For realizing the PROFIBUS interface with a maximum baudrate of 12 MBaud, an ASIC LSPM2 is used. An oscillator block 48 MHz for clock supply is permanently assigned to the LSPM2.
- The RESET is generated with a 7705 chip. The supply voltage applied via the host interface is monitored. At acceleration or undervoltage, RESET is being triggered. RESET can also be applied via the host connector.
- The RS485 interface is laid out isolated for 12 MBaud maximum. Fast, noise-free optocouplers and drivers are used. The signals of this interface are applied to a 10-pole plug connector. For the isolation, a second, isolated supply voltage +5V is to be applied via a 34-pole connector of the host interface (generation on customer application). It is protected against pole reversal with a diode and is loaded with 200 mA maximum. A fuse is to be provided on the customer application. The PROFIBUS signals of the LSPM2 are not available at the host interface. The isolated supply voltage is also applied at the 10-pole connector.
- The supply voltage +5V for the module is also supplied via the host interface (2x34-pole plug connectors). It is protected against pole reversal with a diode. An exchangeable fuse is to be provided on the customer application.
- In addition, the ports A to E of the LSPM2 and the signal „Read/Write Consistent“ are lead to the host interface. The ports A to D can be parameterized with jumpers.
- For reading out the PNO Identnumber and the station address, a serial EEPROM (64 x 16 bits) can be inserted into a socket. In addition, the serial interface is applied to the host interface, so that the user can externally connect a shift register or an EEPROM. The selection is made with a jumper. The base on the module IM 184 remains free. When connecting an EEPROM, it already has to contain the PNO number (preprogramming required). The signals of the serial interface are terminated on the module with pull-down resistors.
- The operating modes “diagnostic error” and “normal operation” of the LSPM2, as well as “Run” (RESET not active) are displayed with LEDs. These signals are also applied to the host connector so that LEDs can be triggered with series resistor externally. The driver capability is 10mA maximum.
- A total of 6 jumpers is provided. They are for assigning parameters to the ports (5 jumpers) and for selecting EEPROM/shift register (1 jumper). In addition, the signals “EEPROM/shift register”, “address change allowed”, as well as 5 lines for port parameterization are applied to the host interface, so that the user can specify the setting on his own module without having to insert jumpers on the IM184. They remain open in that case.
- Standards for wiring the IN/OUT signals of the LSPM2 which are directly applied to the host interface are to be found in the specifications or the user description for the LSPM2.
- The diagnostic port E is wired with pullups; so it won't generate a diagnosis if it is not connected.

4 Connector Pin Assignments and Jumper Settings

4.1 Connector Host Interface

Type: Plug Connector 34-pole
 Pos.-Nr.: X1

PIN	Signal	Type	PIN	Signal	Type
1	PC0	I/O	2	PC1	I/O
3	PC2	I/O	4	PC3	I/O
5	PC4	I/O	6	PC5	I/O
7	PC6	I/O	8	PC7	I/O
9	PE0	I	10	PE1	I
11	PE2	I	12	PE3	I
13	PE4	I	14	PE5	I
15	PE6	I	16	PE7	I
17	PB0	I/O	18	PB1	I/O
19	PB2	I/O	20	PB3	I/O
21	PB4	I/O	22	PB5	I/O
23	PB6	I/O	24	PB7	I/O
25	PA0	I/O	26	PA1	I/O
27	PA2	I/O	28	PA3	I/O
29	PA4	I/O	30	PA5	I/O
31	PA6	I/O	32	PA7	I/O
33	GND	I	34	GND	I

Signal Name

Meaning

PA(7:0)	Data Port A
PB(7:0)	Data Port B
PC(7:0)	Data Port C
PE(7:0)	Diagnostic Port E
GND	Reference potential of control electronics (LSPM2)

On the IM 184 module, the signal inputs of the diagnostic port E are wired with pull-up resistors.

Type: Plug Connector 34-pole
 Pos.-Nr.: X2

PIN	Signal	Type	PIN	Signal	Type
1	PD0	I/O	2	PD1	I/O
3	PD2	I/O	4	PD3	I/O
5	PD4	I/O	6	PD5	I/O
7	PD6	I/O	8	PD7	I/O
9	VCC	I	10	VCC	I
11	INTERCLK	O	12	INTERCS	O
13	GND	I	14	GND	I
15	INTERDI	I	16	INTERDOD	O
17	VCC	I	18	VCC	I
19	RWCONS	O	20	XRESET	I
21	XDIAERROR	O	22	XNORMOPER	O
23	RUN	O	24	XSREE	I
25	TYP0	I	26	TYP1	I
27	TYP2	I	28	TYP3	I
29	TYP4	I	30	ACA	I
31	VCC1	I	32	VCC1	I
33	GND1	I	34	GND1	I

Signal Name	Meaning
PD(7:0)	Data Port D
INTERCLK	Serial Interface Clock, clock sequences for EEPROM or SREG
INTERCS	Serial Interface Chip Select, selection of EEPROM or SREG
INTERDI	Serial Interface Data Input, input data from EEPROM or SREG
INTRDOD	Serial Interface Data Outload, data output channel to EEPROM or Parallel Load Signal for the SREG
XRESET	Reset Input of Host Interface, low-active, places the LSPM2 in a defined initial condition
RWCONS	Read/Write Consistency
XDIAERROR	Diagnostic Error, is set for external diagnosis, triggers a red LED (H3), low active
XNORMOPER	Normal Operation, operating mode display, triggers red LED (H2) if there is a bus error Low: parameter assignment message DA=TS was received (not in the case of broadcast messages), LED OFF High: after RESET and after each expiration of the watchdog timer of the LSPM2, LED ON
RUN	process is running, is triggering green LED (H1)
XSREE	Selection Shift Register or EEPROM High: EEPROM Low: SREG
TYP(4:0)	Type setting of ports A to D of the LSPM2 regarding quantity, I/O, with/without consistency, expanded diagnosis
ACA	Address Change Allowed, the EEPROM content can also be overwritten in the LSPM2 if No_Add_Chg_Bit is set
VCC	+5V, supply voltage for control electronics (LSPM2)
GND	Reference potential of control electronics (LSPM2)
VCC1	+5V, isolated supply voltage for RS485 interface
GND1	Reference potential of the isolated supply voltage for RS485 interface

4.2 Connector BUS Interface (RS485)

Type: Plug Connector 10-pole
Pos. Nr.: X3

PIN	Signal	Type	PIN	Signal	Type
1	-	-	2	VCC1	O
3	-	-	4	-	-
5	RS485_B	I/O	6	RS485_A	I/O
7	RS485_RTS	O	8	-	-
9	GND1	O	10	-	-

Signal Name

Meaning

RS485_A, RS485_B, RS485_RTS
VCC1, GND1

Differential signals A,B and transmit request (TTL)
isolated supply voltage

The supply voltage VCC1 may be used for supplying external devices. The maximum load is 100 mA. The plug connector is designed for connecting a ribbon cable to a 9-pole SUB-D socket.

4.3 Jumper Settings

Pos.-Nr.: X20

Pos. Nr.	Signal	Meaning if jumper is inserted
1-2	XSREE	Selection Shift Register, low; open: EEPROM, high
3-4	TYP0	Type Setting of the Ports A to D of the LSPM2, see I/O Interface (LSPM2 description)
5-6	TYP1	Type Setting of the Ports A to D of the LSPM2, see I/O Interface (LSPM2 description)
7-8	TYP2	Type Setting of the Ports A to D of the LSPM2, see I/O Interface (LSPM2 description)
9-10	TYP3	Type Setting of the Ports A to D of the LSPM2, see I/O Interface (LSPM2 description)
11-12	TYP4	Type Setting of the Ports A to D of the LSPM2, see I/O Interface (LSPM2 description)

These pins are wired with pull-upresistors and can be set to „0“ by plugging a jumper.

5 EMC Concept

The shield is connected externally in the application of the module (for example, on the casing). The RS485 interface is designed isolated.

In addition, the user has to take note that the ribbon cable for the bus connection is to be kept as short as possible. When arranging the cables, EMC is to be ensured.

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