

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6GK1143-0TA02

INDUSTRIAL ETHERNET COMMUNICATION PROCESSOR

Used with the applicable SIMATIC S5 CP 1430 TF configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens SIMATIC S5 CP 1430 TF technical documentation

4.1 CP 1430 TF Hardware

4.1.1 Overview

Purpose

The CP 1430 TF communications processor connects the SIMATIC programmable logic controllers S5-115 U/H, S5-135 U and S5-155 U/H to the SINEC H1/H1FO network.

Versions

The CP 1430 TF is available in two versions with the following characteristics:

- Basic Version
 - DRAM memory configuration: 512 Kbytes
 - Internal configuration memory: 32 Kbytes max. available
 - Clock accuracy: +/- 10 ms
- Extended Version
 - DRAM memory configuration: 2 Mbytes
 - Configuration memory, internal: 128 Kbytes max. available
 - Clock accuracy: +/- 1 ms

The internal configuration memory is backed up by the PLC battery if there is a power failure so that the loaded data are retained.

The CP 1430 TF has a slot for a memory card. Either memory cards with RAM or FLASH EPROM can be used. Memory cards extend the memory area for configuration data.

Use, Handling

The CP 1430 TF can be installed in any PLC slot that is intended for CP operation (slot label: "CP"). If you are using jobs with a hardware interrupt (jobs with priority 0), please refer to the PLC manual for the slots that can be used.

- The connection to SINEC H1 is via a transceiver cable to a SINEC H1 transceiver or via an industrial twisted pair to a twisted pair module of a star coupler.
- The connection to SINEC H1FO is via a transceiver cable to a SINEC H1FO optical transceiver.

Caution When Working on the CP 1430 TF

The CP 1430 TF contains electrostatically sensitive devices (ESD). Please keep to the ESD guidelines when working with the CP 1430 TF.



Never remove or insert the CP 1430 TF module with the power supply switched on.



Never insert or remove memory cards from the CP when the power supply to the CP is on.

4.1.2 Design

The CP 1430 TF is mounted on a double Eurocard format board. The width of the front panel is 1 1/3 standard slots.

The CP 1430 TF is equipped with the following:

- Two 48-pin backplane connectors (ES902 Row 2).
- One 15-pin socket connector on the front panel with securing screws for connecting a programming device.
- One 15-pin socket connector with securing screws on the front panel
 - for connecting an Ethernet transceiver via a transceiver cable
- or
 - for connecting a star coupler via an industrial twisted pair cable.
- The front panel of the module has a rectangular slot for a memory card.
- Operator controls and displays.

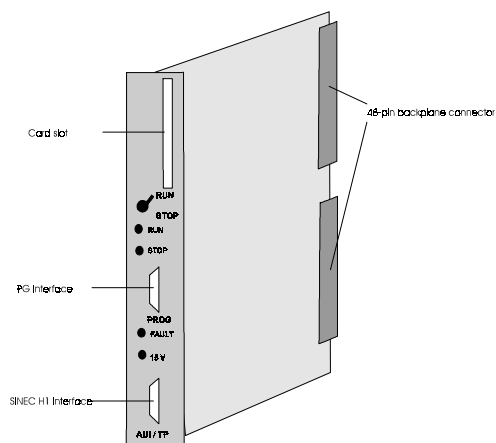


Fig. 4.1: CP 1430 TF Module

4.1.3 Displays and Controls

The CP 1430 TF has the following displays and controls (Fig. 4.2:)

Controls:

RUN/STOP mode selector:

Using the mode selector, you can switch the CP 1430 TF from the RUN to the STOP mode (see above). If no other STOP condition exists, you can also switch the CP from the STOP to RUN mode using the mode selector.

Displays:

RUN

Signals the "interface to SINEC H1/H1FO in operation" status.

The green RUN LED can only light up when the mode selector is set to RUN.

STOP

Signals the "interface to SINEC H1/H1FO not operational" status.

The red STOP LED can also be lit when the mode selector is set to RUN.

FAULT

Indicates that the available memory area has been exceeded (flashing) or a hardware fault (lit permanently).

15V

Indicates that the 15V power supply for the transceiver is functioning correctly.

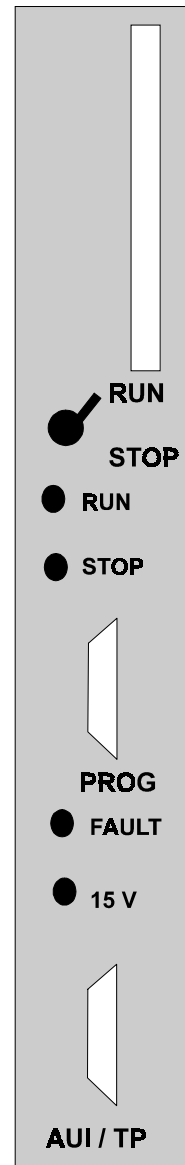


Fig. 4.2: Front Panel

4.1.4 Memory Card Slot

Memory cards can be inserted in the CP 1430 TF slot. These memory cards are used to save a CP database created with the NCM COM 1430 TF configuration tool. The following memory cards are available:

➤ RAM Cards:

- 256 Kbytes order no.: 6ES5 374-2AH21
- 512 Kbytes, order no.: 6ES5 374-2AJ21^{*1}
- 1 Mbyte, order no.: 6ES5 374-2AK21^{*1}
- 2 Mbytes, order no.: 6ES5 374-2AL21^{*1}

^{*1}= up to 256 Kbytes can be used for configuration data. The remainder is available as DRAM memory expansion.

➤ Flash EPROM Card:

- 128 Kbytes, Order no.: 6ES5 374-2FG21
- 256 Kbytes, Order no.: 6ES5 374-2FH21
- 512 Kbytes, Order no.: 6ES5 374-2FJ21^{*2}
- 1 Mbyte, Order no.: 6ES5 374-2FK21^{*2}
- 2 Mbytes, Order no.: 6ES5 374-2FL21^{*2}
- 4 Mbytes, Order no.: 6ES5 374-2FM21^{*2}

^{*2}= up to 256 Kbytes can be used for configuration data. EPROM cards with more memory than 256 Kbytes bring no advantage.

4.1.5 Settings on the CP 1430 TF

In contrast to the previous CPs (CP 535 and CP 143 TF) no DIP switch or jumper settings are necessary on the CP 1430 TF.

The type of connection to SINEC H1/H1FO (AUI connection or industrial twisted pair) is recognized by the CP 1430 TF automatically.

4.1.6 Installing the CP 1430 TF in the PLC Rack

The CP 1430 TF can be installed in any PLC slot that is allowed for CP operation (slot label: CP). With PRIO 0 jobs, the CP 1430 TF triggers an interrupt to the CPU of the PLC at the receiving side. Since not all CP slots have interrupt lines, you must select a slot with an interrupt line if you intend to use jobs with priority PRIO 0.

For more information about PLC slots, please refer to the PLC manual.

4.1.7 Connecting the CP 1430 TF to the SINEC H1/H1FO Network

The CP 1430 TF can be connected to the SINEC H1 network as follows:

- With a transceiver using an AUI connection

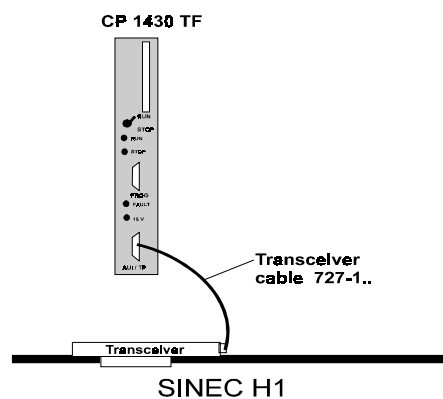


Fig. 4.3: Connecting a CP 1430 TF to SINEC H1 with AUI / Transceiver

The CP 1430 TF generates and supplies the 15 V power required by the transceiver.

➤ Industrial twisted pair connection for example via a transceiver or hub.

When using the SINEC H1 twisted pair as shown in the diagram, the CP 1430 TF automatically recognizes and adjusts itself to the twisted pair. Information about the pinouts can be found at the end of this chapter.

Using industrial twisted pairs, cable lengths of up to 100 m can be implemented.

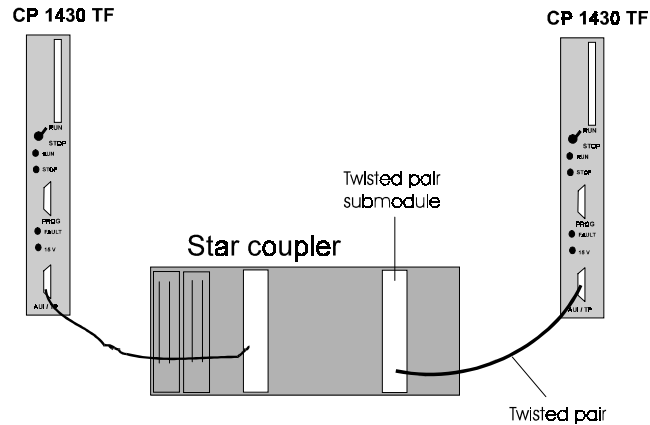


Fig. 4.4: Connecting the CP 1430 TF to SINEC H1 with TP/Star Coupler or Hub

- The CP 1430 TF can be connected to the SINEC H1FO network using a SINEC H1FO optical transceiver and AUI connector.

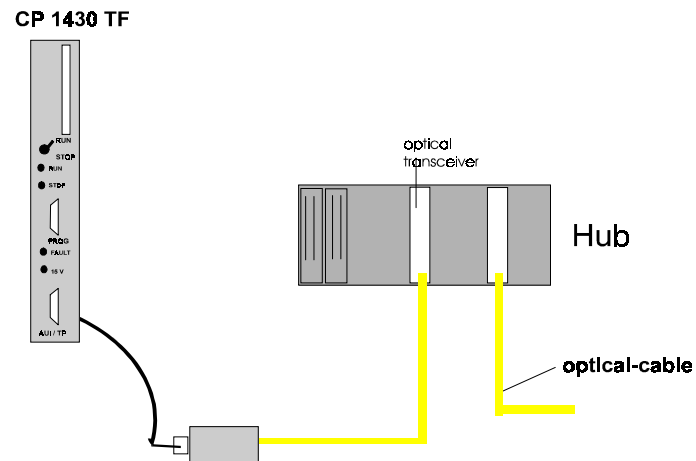


Fig. 4.5: Connecting the CP 1430 TF to SINEC H1FO with AUI / Optical Transceiver

4.1.8 Connecting Cable 725-0 ("Swing Cable")

The CP 1430 TF can be connected to the PLC using a 725-0 connecting cable (swing cable). Signals are sent on this cable when PLC functions are used on a bus path or when domain or PI services are used.

The + 24 V power supply must be present on the PLC to allow the AS511 interface to the CPU to function.

At both ends, the signal cable has 15-pin sub D male connectors. Please make sure that the cable is connected correctly as explained in the description of the connectors.

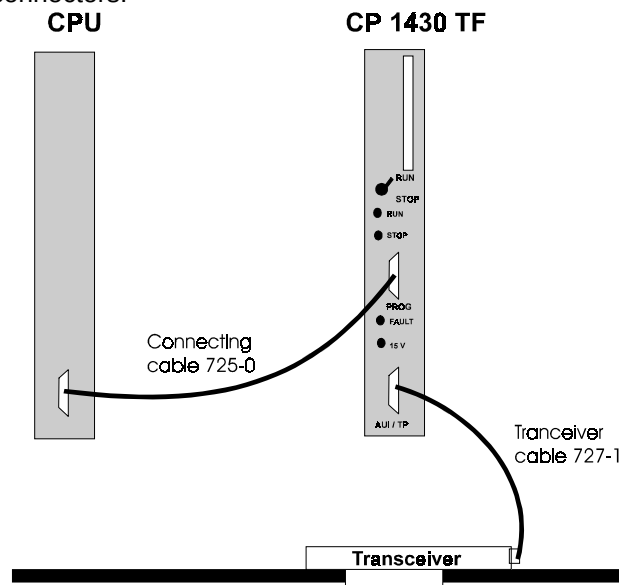


Fig. 4.6: Connecting the PLC with a Swing Cable

4.1.9 Dual-Port RAM Interface Between the CPU and CP

The CP 1430 TF communicates with the SIMATIC PLC using handling blocks via a dual-port RAM. The dual-Port RAM allows simultaneous access by both modules.

How the addressing works, is explained based on the diagram below.

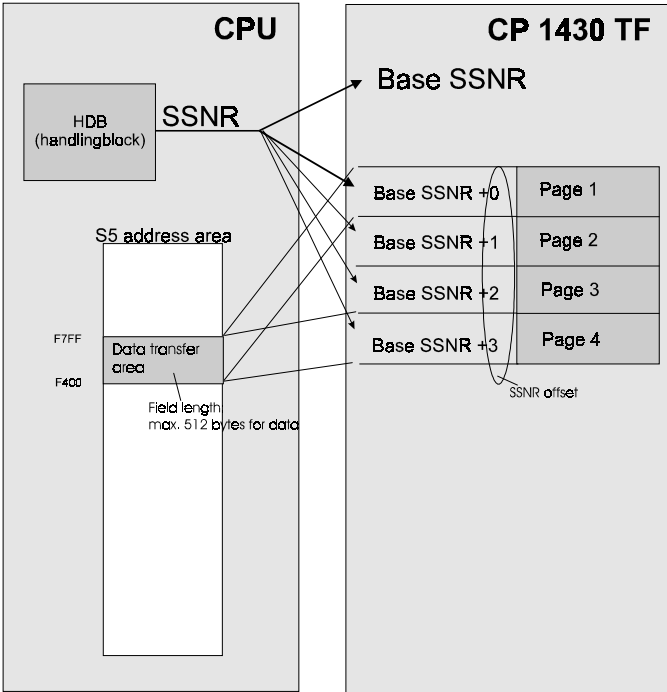


Fig. 4.7: Addressing on the Dual-Port-RAM Interface

In the handling block of the PLC program, you use the interface number (SSNR) to address the CP 1430 TF communications module. The interface number contains the following:

Base interface Using the base SSNR, the PLC selects the CP
number (base SSNR): and its 4 Kbyte dual-port RAM.

The page address (SSNR offset):

A CPU addresses the four pages using the 1 Kbyte address window F400 H to F7FF H. The page is determined by the SSNR specified in the handling block.

M 2-1

The base SSNR and the page (SSNR offset) used for communication is configured in the '**CP Basic Initialization**' dialog with the COM 1430 TF configuration tool.

Example: The base interface number 16 and the page address 2 are configured as shown below.

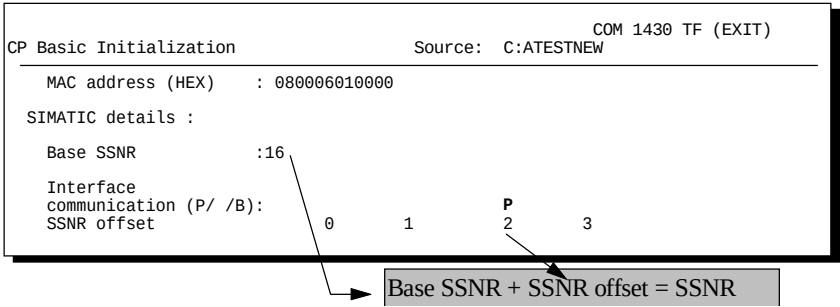


Fig. 4.8: Configuring the SSNR using the Base SSNR and Page Address

This configuration produces SSNR=18. A CP 1430 TF configured in this way, can communicate with CPU number 3 in the multiprocessor mode.

If several communication processors are being used in a programmable logic controller, make sure that there is no double addressing. This means that a base SSNR must be unique in the PLC. If, for example, a CP 5430 (Order Number: 6GK1543-0AA00) exists in the PLC, remember that its dual-port RAM occupies 8 Kbytes of memory (note: The new CP 5430 TF, Order Number:6GK1543-0AA01) occupies only 4 Kbytes of memory.

- Special features of addressing using backplane bus communication are explained in Section 4.2.4 .
- Special features of the multiprocessor mode are explained in Section 4.2.3 .

4.2 Configuration and Installation

4.2.1 Overview

To configure the module, you require a PG with the NCM COM 1430 TF tool described in this manual. You can enter the configuration data using one of the two following methods:

➤ **Online CP**

The CP is connected via the AS511 interface or via a bus path so that the data you input is transferred directly on the CP. You can save the configuration data at any time by transferring the data from the CP to a database file on the PG.

➤ **Offline FD**

The configuration data are saved in a database file on the PG.

A PG-CP connection is only necessary when you want to load the configured database on the CP.

You can, however, load the configured database on a memory card inserted in the PG and then insert this memory card into the CP. In this case, you do not need a PG-CP connection except for diagnostic and test purposes.

Connecting the PG and CP

A connection between the PG and CP is required in the following situations:

- To configure the CP ONLINE.
- To transfer a database from the PG to the CP and vice versa.
- For diagnostic and test functions.
- For programming the PLC and using the PLC test via SINEC H1 (see also PI and domain services described in Volume 2 of this manual).

The PG and CP can be connected in two different ways:

1. Direct connection of the PG to the CP 1430 TF via the serial interface (AS511/connecting cable 734-2).
2. Bus path: The PG is operated on the network, for example using a CP 1413 connected to SINEC H1.

PG Connection Using the AS511 Interface

The following diagram illustrates a possible configuration via the AS511 interface.

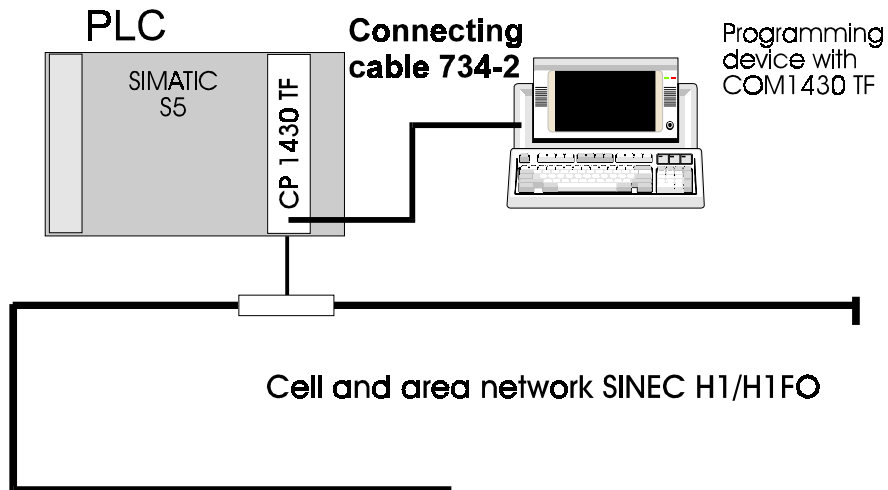


Fig. 4.9 PG Connection using the AS511 Interface

In this configuration, the CP 1430 TF in PLC 1 is connected directly to the PG via the AS511 interface.

4.4 Technical Data

Operating and Environmental Conditions

Degree of protection	IP 00
Permitted ambient temperature in operation	0 to 60 °C operation without fan
Transport and storage temperature	-40 to +70 °C
Humidity class	95% humidity at 25 °C, no condensation
Operating altitude	up to 3000 m above sea level

Table 4.3: Operating and Environmental Conditions

Components and Transmission Rates

Microprocessor	80386 SX 20 MHz
Ethernet controller	82596 SX 20 MHz
Ethernet serial interface:	82503
Transmission rates	- AS511 TTY interface, 9600 bps - AUI interface, 10 Mbps - TP interface, 10 Mbps

Table 4.4: Components and Transmission Rates

Mechanical and Electrical Data

Weight	Approx. 0.6 kg
Board format	Double Eurocard (160 x 233.4 mm)
Front panel width	20.3 mm (= 1 1/3 standard slots)
Backplane connector	ES 902, 2 x Row 2, 48-pin
Front connectors - PG connector - AUI/TP connector	15-pin D SUB with securing screws 15-pin D SUB with securing slide
Supply voltages	+ 5 V, + 5%, - 5% +24 V, +25%, -15%
Current consumption	+ 5 V: 2.7 A max. At rated load 0.5A by transceiver +24 V: max. 70 mA UBATT (battery backup) : 110 µA max. 20 µA typical.

Table 4.5: Mechanical and Electrical Data

Other Data Depend on the Version

CP Type Characteristic	Basic Version	Extended Version
Dynamic RAM	512 Kbytes	2048 Kbytes
Internal capacity for configuration data	32 Kbytes	128 Kbytes
Memory reserved for dynamic configuration data (domain and PI services)	16 Kbytes	32 Kbytes
Size of the dual-port RAM for the CPU-CP interface	4 Kbytes	4 Kbytes
Memory capacity of the memory cards - Flash EPROM - RAM	128/256 Kbytes 256 Kbytes - 2 Mbytes	
Clock accuracy - Resolution - Relative	10 msec 20 msec	1 msec 2 msec

Table 4.6 : Characteristics of the CP 1430 TF Dependent on the Version