C1120
S5 to II/O-Lightbus Interface

Technical Documentation
VERSION 2.1

BECKHOFF

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1   Functional description of Hardware

C1120

General

The interface card C1120 is an intelligent interface between the BECKHOFF II/O-Lightbus System and a SIEMENS SIMATIC S5 PLC. The SIEMENS PLC program is enabled to access binary and analog inputs and outputs of the II/O-Lightbus System via a Dual Ported RAM of the interface card. The I/O addresses of the II/O-Lightbus System are mapped to the S5 I/O address memory map with a configuration program running on a personal computer. The interface card C1120 is placed in a PLC slot for 'intelligent peripherial devices'.

2   Functional description of Software

For further documentation it is assumed that the interface card C1120 is connected to a PC running DOS with a serial interface cable to COMx.

2.1   Installation of Software

First step: Backup copy of installation disc

Do not forget to backup your installation disc and use the backup copy instead of the original software disc.

- switch on your PC

- Use DISCCOPY to backup your installation disc

- Use your backup disc for the installation.

Installation to hard disc

1. switch on your PC

2. (generate and) change to your destination directory

3. insert the installation disc copy to floppy drive A:.

4. change to drive A:;

4. type: 'INSTALL C: <RETURN>'

The installation routine will copy all files to your destination directory of disc C: (or equiv.).

Start of program

start the C1120 setup program with 'PROGRAM <RETURN>' from your destination directory of your PC.

2.2   Main menu

First screen after the start of program shows:

```
                                                    28.07.97  14:03:03
 M A I N    M E N U                                                  R

                            MAIN   MENU
     F 1   H
                        B E C K H O F F
     F 2   M      I N D U S T R I E   E L E K T R O N I K

     F 3   S      Configuration software for C1120 Module
                            VERSION  2.1
     F 4      COPYRIGHT(C)1996 BECKHOFF INDUSTRIE ELEKTRONIK
                        ALL RIGHTS RESERVED
     F 5   P




 F1       F2        F3       F4      F5      F6      F7      F8      F9      F10
  HELP     MASTR    SLAVE            PROJ                           PROG    SYS
           SETUP    SETUP            MANAG                          END     ENTRY
```

All actions are taken with the function keys F1 to F10. Some actions are provided with security questions. If the desired action is valid, type 'J' or 'Y' to activate, 'N' or ESC to quit. By choosing the key ESC you are able to return to the higher menu levels.

Function keys

F1   *HELP*

Shows a help text for the equivalent menu and function keys.

F2   *MASTER SETUP*

changes to the master setup menu to map the II/O Lightbus System addresses to the I/O addresses of the SIEMENS PLC.

F3   *SLAVE SETUP*

changes to slave setup

F5   *PROJECT MANAGER*

changes to the project manager menu to choose the working project from a list of (setup) projects.

F9   *PROGRAM END*

returns to DOS after closing the application.

F10 *SYSTEM ENTRY*

changes to the setup menu of the running program.

2.3   Master Setup

The master setup menu is accessed by pressing F2 key from the main menu. With this menu, the address mapping between the II/O-Lightbus system and the SIEMENS PLC is displayed and can be edited, saved under a project name and transfered from and to the C1120 card.

```
                                                        25.07.97  12:50:06
  MASTER-SETUP /  8 MODULS          Project Directory   : DEFAULT        R
 ┌No┬Mod┬─Description─────┬CDL┬─D0────┬─D1────┬─D2────┬─D3────┬─Ident┬STG┐
  1   1  DIRECT MODULE 1    1  E   23  E   24      0        0     1    0
  2   2  DIRECT MODULE 2    3  A   23  A   24  A   25  A   26     2    0
  3   3  INDIRECT MODULE 1  4  IE   0  IE   0  IA   0  IA   0     3    0
  4   4  INDIRECT MODULE 2  4  IA   0  IA   0  IE   0  IE   0     4    0
  5   5  DIRECT MODULE 3 OUT 3 M    1  K  128  A   21  A   22     5    1
  6   5  DIRECT MODULE 3 IN  2 M    1  K    0  E   25  E   26     5    1
  7   6  STRING MODULE 2    0       0       0      0        0     6    1
  8   7  FAST CDL MODULE 1  5  SA 200  SE 200  SA 201  SE 201     7    0
  9   8  FAST CDL MODULE 2  5  SA 202  SA 203  SE 202  SE 203     8    0
 10   0                     0       0       0      0        0     0    0

                                                        Project : DEMO


 F1        F2       F3       F4       F5       F6       F7     F8       F9       F10
  HELP      EDIT     EDIT     TIMER &  C1100            PRINT   SAVE    ONLINE    PREV
            CONFIG   IOLIST   INTRPT   ->C1120          PROJ    PROJ    MENU      MENU
```

The screen shows different fields for input, status line and function key setup.

   Function keys:

   F1   *HELP*

      Shows a help text for the equivalent menu and function keys.

   F2   *EDIT CONFIGURATION*

      with this menu you can change the C1120 configuration.

   F3   *EDIT I/O LIST*

      with this menu you can modify the I/O address map list.

   F4   *TIMER & INTERRUPTS*

      with this menu you can configure the four fast fieldbus interrupts of the Beckhoff II/O Lightbus System.

F5   *C1100 -> C1120*

with this menu projects of the Beckhoff C1100 card are converted to C1120 projects.

F7   *PRINT I/O LIST*

prints the I/O map to your printer on LPT1:.

F8   *SAVE PROJECT*

stores the setup of C1120 under a project name - if first time used you are asked for a project name. At further store commands, a <RETURN> stores under existing project name.

F9   *ONLINE MENU*

changes to the communication menu to exchange data with the C1120 card.

F10 *PREVIOUS MENU*

returns to the previous menu.

C1120 Configuration

with this menu you can change the C1120 configuration to setup all necessary parameters for the C1120 interface.

```
                                                      25.07.97  12:42:49
  MASTER-SETUP /  8 MODULS        Project Directory   : DEFAULT        R

                                                  Projekt : DEMO
   S5-CommChan.           :  250
   Address single Request :  128
   Addr. indirect Request :   60    Amount indirect modules   :   2
   Pageswitch Inputs      :   23    ──────> Activate          :   1
   Pageswitch Outputs     :   70    ──────> Activate          :   1
   Word Alignment         :    1
   Error Request          :    0    Free Run                  :   0
   PLC IRQ message        :    1
   S5 page number         :    0

   String communication             Fast PLC channel
     Transmit Base        :    0      Activate               :   1
     Receive Base         :  130      IRQ message            :   1
     Maximum stringlength :  128

  F1      F2      F3      F4      F5      F6      F7      F8      F9      F10
   HELP    SET                                                          PREV
           DEFAULT                                                      MENU
```

The field "S5-CommChannnel" describes the base address for the parallel channel functions (see chapter "parallel channel"). For use of more than one C1120 cards in one PLC the base address default of 250 for the communication channel can be changed to an other address (from address 128 - 250, length 6 Byte). The address for status register will automatically change to input value +4 and the address for interrupt request will change to input value +5.

A single request is able to access an II/O Lightbus module directly without synchronized exchange with the process image (between read of input process image and output process image write)*, by use of the STEP 5 commands "Load I/O process peripherials" e.g. " Transfer I/O process peripherials ". Therefore, the base address "Address single request" of an address block for the single request is to be defined between 128 and 250. By setting a "0" for the base address "Address single request" the single request is disabled.

_____

* the PLC updates the Transfer Process Image automatically

To enlarge the I/O address space, the use of "indirect modules" is available - a list of module data fields is stored in the C1120 RAM memory. The base address to exchange data with the Process image of the PLC is defined here (see equiv. chapter).

To obtain correct data for the PLC process image, the process image memory of the C1120 is divided in pages, which each by each are switched towards the PLC and towards the II/O Lightbus to refresh data contents. The pageswitch mechanism changes the memory pages to and from the PLC. The pageswitch inputs are defined as lowest address, the pageswitch outputs are defined as highest address by default.

By writing a "1" to the field "word alignment", the PLC is enabled to access the process image by word commands (16 bit - wise) The necessary selects are generated automatically. For use of more than one C1120, the word alignement can be disabled by overwriting a "0".

The default setup value of "0" in the field "Error request" enables the C1120 to stop the PLC with a timeout status of the C1120 in case errors occur on the II/O-Lightbus System, the C1120 interface deletes the I/O addresses in the Dual Ported RAM mapped to the PLC in case of error. By programming OB 23 and OB 28 the timeout can be managed by PLC software.
By setting the field value "Error request" to "1", the I/O addresses are not deleted in case of errors. The latest input data values are held in place, the writing of outputs data is confirmed, but writing is not executed, the error flag in the status byte is set.

IMPORTANT REMARK:

By use of option "1" the user has to achieve the check of the status byte error flag in every PLC cycle to branch into a error routine, if the error flag is set.

After occurance of the error flag the fault number and number of modules can be read via the parallel communication channel. After return from the fault situation (repair of fiber optic media) a start of the II/O-Lightbus System can be forced by resetting the C1120 by software from the PLC.

In case of no success of the reset function, the error flag is set again, and as a return value of the function RESET-LWL the value of the init- error is returned (refer to chapter "Parellel communication channel").

By setting the "Free Run" option to "1" in the equivalent mask, the inputs of the II/O-Lightbus System are read asyncronously to the PLC- process image at maximum II/O Lightbus communication refresh rate. The pageswitch mechanism displays the newest process image memory page to the PLC.

Entering a "1" in the field **PLC IRQ Frame** causes the C1120 to send an extra control and interrupt message frame for triggering a local process image cycle on the intelligent peripheral modules. Those message frames are appended to the process data message frames.

The current page address of the C1120 is entered in the **Page Number** field.
String communication is used for communicating with intelligent peripheral modules. It can be used, among other things, for configuring the modules. The data packages (strings) are transmitted to the C1120 by way of the page frame.
The field **Transmit Basis** is for entering the page frame offset for the strings being sent. It should be noted that starting from the offset, 2 bytes are reserved for the handshake between PLC and C11220. The actual string is entered starting at the offset + 2.
The field **Receive Basis** is for entering the page frame offset for the strings being received. It should be noted that starting from the offset, 2 bytes are reserved for the handshake between PLC and C11220. The actual string is entered starting at the offset + 2.
The field **Maximum String Length** is for entering the maximum permissible length of the strings.

The purpose of the **fast communications channel** is for improved process synchronisation during multi-processor operation (see also "Fast Communications Channel").
Entering a "1" in the **Activate** field enables the fast communications channel (see also "Fast Communications Channel").

Entering a "1" in the field **IRQ Frame** causes the C1120 to send an extra control and interrupt message frame for triggering a local process image cycle on the intelligent peripheral modules assigned to the process channel. Those message frames are appended to the process data message frames.

function keys

F1   *HELP*

displays help text.

F2   *SET DEFAULT*

sets configuration parameters to default.

F10 *PREVIOUS MENU*

returns to the master setup menu.

IMPORTANT REMARK regarding the page number:

The page number for data exchange with the PLC is configurable, beginning with interface version numbers **above** V 1.51. Up to Version 1.51, the page number for data exchange is 0 by default.

C1120 I/O Memory Map List

All used II/O-Lightbus modules must be listed in the I/O list. The order of modules in the I/O list must reflect their physical position in the II/O-Lightbus System ring.

```
                                                    25.07.97  12:44:26
 MASTER-SETUP  /  8 MODULS        Project Directory  : DEFAULT        R

 No Mod   Description      CDL  D0      D1      D2      D3      Ident STG
  1   1  DIRECT MODULE 1     1  E    23  E    24      0       0     1   0
  2   2  DIRECT MODULE 2     3  A    23  A    24  A   25  A   26     2   0
  3   3  INDIRECT MODULE 1   4  IE    0  IE    0  IA   0  IA   0     3   0
  4   4  INDIRECT MODULE 2   4  IA    0  IA    0  IE   0  IE   0     4   0
  5   5  DIRECT MODULE 3 OUT 3  M     1  K   128  A   21  A   22     5   1
  6   5  DIRECT MODULE 3 IN  2  M     1  K     0  E   25  E   26     5   1
  7   6  STRING MODULE 2     0        0        0       0       0     6   1
  8   7  FAST CDL MODULE 1   5  SA  200  SE  200  SA 201  SE 201     7   0
  9   8  FAST CDL MODULE 2   5  SA  202  SA  203  SE 202  SE 203     8   0
 10   0                      0        0        0       0       0     0   0



                                              Project : DEMO



 F1      F2      F3      F4      F5   F6   F7   F8   F9   F10
 HELP    INSERT  CLEAR   INSERT                           PREV
         MODULE  LINE    ROW                              MENU
```

First step is to edit the I/O list:

Each new module is to be introduced to the list by pressing "F2": "Insert module". No actions take place during editing without adding a module as described. Addresses of existing modules can be edited and overwritten easily, modules can be deleted by pressing "F3". If a module is deleted, it has to be removed from the II/O-Lightbus System ring.

The coloumn "No" holds the actual line number. The coloumn "Mod" holds the corresponding module address. The coloumn "Msg" is without further use. The coloumn "Description" keeps a 20 character user description of the module name or function. The "CDL" - coloumn is used internally.

The address name of the SIEMENS PLC process image is entered in the fields "D0" to "D3". You can use any order or use addresses twice etc.

The coloumn "Ident" maps the indirect modules to their physical II/O-Lightbus address.

In the column "STG", those modules that are to be processed as part of the string communication are identified by a "1". Those modules are similarly assigned to their physical module addresses by means of the Ident number.

Warning !   The interface card C1120 is not able to identify modules. If the I/O list and physical order of modules are different, or the inputs and outputs are set up incorrectly by DIP switches, I/O data is transferred erroneous from the PLC program to the modules without recognition.

Function keys

F1 *HELP*

displays help text.

F2 *INSERT MODULE*

by pressing "F2" a new module is inserted at the current cursor position. The address is set to the equivalent line number. Following module addresses are incremented. After inserting a new module, description, I/O addresses and ident no. can be edited. Every line of the I/O list, containing a module number and I/O addresses, generates one telegram for II/O-Lightbus per PLC cycle.

F3 *CLEAR MODULE*

by pressing "F3" a line of the II/O setup is deleted. A confirmation is necessary for that action to take place.

Warning !	In case of deleting a module from the I/O list, it is definitively necessary to remove the equivalent module from the II/O-Lightbus ring. Otherwise the II/O-Lightbus ring is incorrectly configured and is not ready to work.

F4 *INSERT ROW*

If it is necessary to serve a module with more than one telegram per cycle, additional telegrams are generated by inserting a line to an existing module entry. In this case, the inserted line holds the same module number as the line before.

F10 *PREVIOUS MENU*

returns to the master setup menu.

Modules can be set up in the configuration list as:

-       direct module or

-       indirect module,

depending on the necessity of access in every PLC cycle. This is supplied to enlarge the address space of the PLC above 128 bytes process image.

Direct modules

Direct modules are mapped directly to the PLC process image. The PLC process image addresses are edited in the I/O byte addresses D0 to D3 of every telegram frame belonging to the module - each line in the setup screen belongs to a dedicated II/O-Lightbus telegram frame to the addressed module. The address names (e.g. O 10) of the PLC programm are used for reference.
Example given: the modules 1 and 2 are mapped as direct modules. The STEP5 program accesses the I/O addresses 23 to 26, the C1120 maps the I/O data to the modules 1 and 2:

                IB 23, IB 24   from module 1
                OB 23, OB 24, OB 25, OB 26   to module 2

The inputs and outputs can be addressed bit-, byte-, or wordwise:

                I 23.0 ... I 23.7, oder IW 23 = IB 23 & IB 24

are handled as usual.
All direct mapped modules are refreshed synchronously and cyclic with the PLC cycle and process image refresh. The direct mapped modules can be accessed directly from the PLC program at any time.

The modules 7 and 8 are also direct modules. However, they are assigned to the fast communications channel by means of their identification codes "SA" and "SE" respectively.

If intelligent modules are to be addressed during the PLC cycle (e.g. terminal bus coupler) the first two data bytes (D0, D1) can be assigned constants. Those constants are entered with the identification codes "M" (for memory) and "C" (for constant).
In the example, D0 on module 5 is assigned the fixed value 1 ("M") and D1 the fixed value 128 ("C").

Indirect modules

To enlarge the address space of the PLC system, modules can be mapped "indirectly":
they are accessed via a list of "indirect" communications, being addressed by a dedicated base address. These communications are processed in every PLC cycle. They can be used to enlarge the address space of 128 I/O Bytes of the PLC by placing the base address of the indirect communication list above 128. Another option is to change the contents of the I/O list cycle by cycle: a part of the II/O-Lightbus modules are mapped in a round robin way to the indirect I/O list to fit the total number of II/O Lightbus I/O bytes to the I/O address space of the PLC, with the effect, that those modules are being served only at occurence in the indirect communications list. One or more modules can be mapped to the indirect communications list. A single address block consists of the module address (IDENT number) and four bytes of I/O data. The reservation of memory space is done with the menu "Edit configuration": After definition of the base address of the indirect I/O list it is necessary to allocate 5 x (number of modules) Bytes list size: First byte contains the address number, following four bytes containing the I/O data. The list ends with a "0" found in an address byte location. These addresses are not available for standard I/O via PLC process image transfer. Address conflicts have to be avoided by the PLC programmer.

Arbitration of indirect modules

Indirect modules are listed in the I/O setup list, coloumn "D0 .. D3" with IE or IA, with address number 0. The choice of IE or IA is without use for the communication and only indicates the configuration of the II/O-Lightbus modules for input (IE) or output (EA).
By use of the indirect communications list every module in the II/O Lightbus System can be accessed, even the direct configured: Their IDENT- number has to be placed in the first address block address location, following four bytes keep I/O data. By this, the module is accessed via the indirect communication mechanism. By replacing the IDENT number in the first location of the address block with "0", the indirect communication is skipped. If the programmer decides to address a direct module via indirect communication, the module is addressed twice by the II/O-Lightbus System.

Important!	If inputs are read via indirect communication, the programmer has to regard that input informations are valid one cycle after the following. Outputs are written during the following cycle . This effect can be managed by using the statusbyte of the PLC (PB/PY 254): Bit 1 acts as life bit and changes status every cycle. By reading the life bit the programmer can recognize and count cycles (refer also to chapter "status register S5/C1120).

Example:

In above shown setup screen the modules 3 and 4 are mapped indirect. The base address for indirect communications list is set up to 60, number of indirect modules is 2. By this, 10 Bytes of address block space are available for the programmer: Byte 60 contains the IDENT-number of module 3 (3), the bytes 61 to 64 are I/O data for module 3. Address 65 keeps the IDENT number of module 4 (4), bytes 66 to 69 are I/O data for module 4. Byte 70 is available for standard or direct I/O.

Arbitration of a single load /transfer of peripherial bytes

As used with the indirect communications list every module in the II/O Lightbus System can be accessed immediately via a single communication list: The IDENT- number of a dedicated module has to be placed in the first address block address location, following four bytes keep the I/O data.

For handshake purposes two bits in the Status Byte of the PLC can be used: PB/PY254 and PB/PY 255 Bit 0:

First, IDENT number and I/O data are written to the single communication list. Then, bit 0 of PB/PY 254 is set (strobe bit) by the PLC. After this, a transfer to PB PY 255 with any data forces an interrupt and II/O Lightbus communication with the C1120 interface.

The C1120 interface card responds with setting the bit 0 of PB/PY 254 (ACK bit): the data byte contents are valid and can be read by the PLC with L PB. The PLC handshakes with resetting the bit 0 of PB/PY 254 (strobe bit). The C1120 ends the handshake cycle by resetting the ACK bit 0 of PB/PY 254.

By setting "address single communication" to 0 in the setup screen, this option is not supported during the use with this setup.

Example :
The value of the single communication address is set to 128.

S5	**C1120**
1.) Transfer identnumber for dedicated II/O-Lightbus module address to PB/PY 128	
2.) Transfer transmit data from memory flags or equiv. to PB/PY 129,130, 131, 132	
3.) Set strobebit 　　L　　KB　　1 　　T　　PB/PY　254	
4.) Force interrupt on C1120: transfer something to PB/PY255 　　L　　KH　　AFFE 　　T　　PY　　255	
5.) Polling of ack- bit in statusregister	II/O-Lightbus communication doing transfer to and from the module
6.)	Set of Ack.- bit in statusregister
7.) Load of valid data from the single communication list to destination 　　L　　PW 　　T　　DW 　　T　　MW	
8.) Reset strobebit 　　Polling of ack- bit in statusregister	
9.)	Reset of Ack.- bit in statusregister

Fast Communications Channel

If the S5 is run in multi-processor mode, one CPU can be assigned the fast communications channel in order to improve process image synchronisation.

The fast communications channel works only with a selection of peripheral modules which are given the identification codes "SA" or "SE" on the IO List. The range of values for the entries is from 128 to 255. The priority for fast communication is lower than for single box mode and higher than for cyclical operation.

To activate the channel, you must enter the option "1" in the Activate field in the menu option Edit Configuration.

Handling of Fast Communications Channel

The fast communications channel is operated with a handshake procedure.

The sequence for the individual steps is described below.

	S5	**C1120**
1.)	Writes a 1 to the cell Page + 1023 (Interrupt)	
2.)	Polls the cell Page + 1022 while cell equals 0	Process image for fast communications channel is updated
3.)	-"-	Process image is updated, Acknowledged by writing a 1 to the cell Page + 1022
4.)	Writes a 0 to the cell Page + 1023 (Interrupt)	
5.)	Polls the cell Page + 1022 while cell equals 1	Writes a 0 to the cell Page + 1022

Timer and Interrupts

With this menu the four fast interrupts of the Beckhoff II/O-Lightbus System can be configured:

```
                                              25.07.97  12:45:58
   TIMER & INTERRUPTS              Project Directory  : DEFAULT        R

     II/O Interrupts              S5 IRQ            Count
     II/O IRQ 0 : Pos. transition    1                0
     II/O IRQ 1 : Neg. transition    0                1
     II/O IRQ 2 : Pos. & neg. tr.    1                1
     II/O IRQ 3 : Not activated      0                0

                                        Timer Configuration
     S5-IRQ address : 190                Timer Period  :  100 ms
                                         Count Address :  180




                                              Project : DEMO




 F1      F2      F3      F4      F5      F6      F7      F8      F9      F10
  HELP                                    IRQ                             PREV
                                         CONFIG                           MENU
```
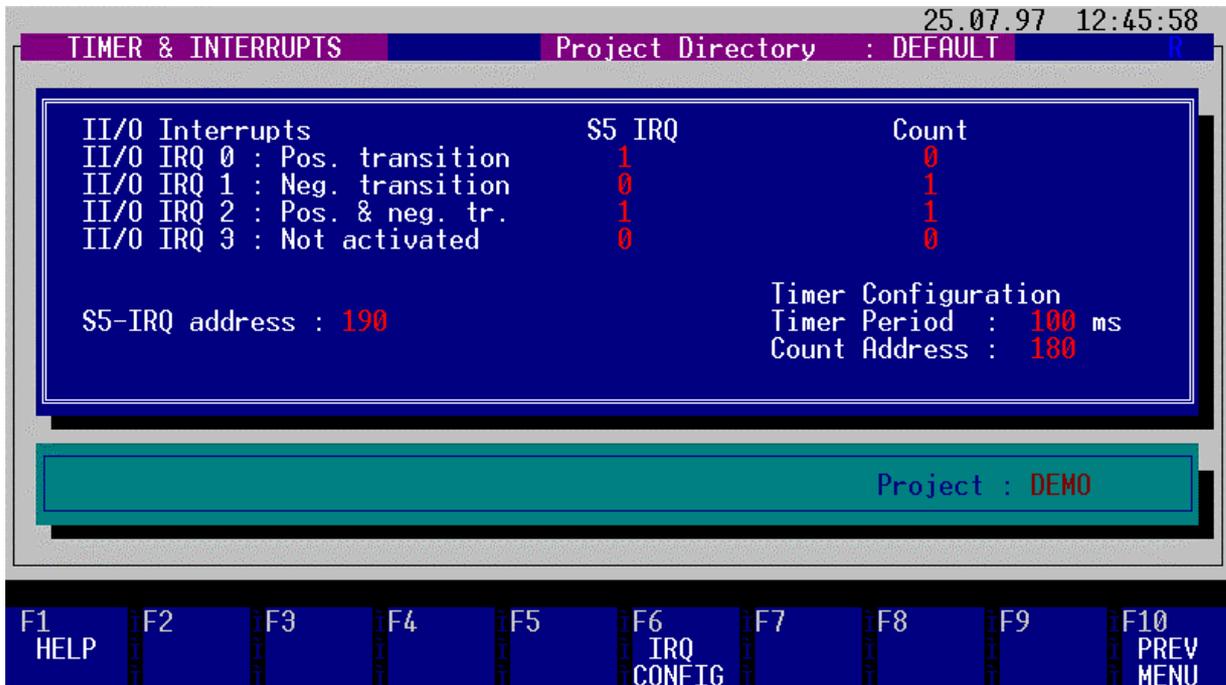
It is possible to connect the interrupts with a free running timer. To select the timer period, enter the timer period in the equivalent field. Valid values are 0 ms (meaning "timer disabled") up to 1677 ms.

Interrupts can be counted: The field "count address" holds the base address of the counters of the four interrupts. Each counter is two bytes long, therefore 8 bytes are reserved. To enable a counter, the field "Count" should hold a "1".

The fast interrupts are configured by moving the cursor the the equivalent line and interrupt field, pressing key "F6" repetitively to choose the characteristic from "not activated", "rising edge", "negative edge", "toggle".

The fast interrupts are configured by positioning the cursor on the relevant interrupt field and pressing the function key F6 to select the desired characteristic. Pressing the F6 key toggles between the options "Not Activated", "Positive Edge", "Negative Edge" and "Change of Edge".

If the relevant interrupt channel is activated by a "1" in the column "S5 IRQ", when the interrupt event occurs, an interrupt is triggered on the S5.

An interrupt request is reset by reading a specific cell in the Dual Port RAM. The base address entered in the field **S5 IRQ Address** indicates the address offset. In the example, accessing the address 190 would reset interrupt request 0, and accessing address 192 would reset interrupt request 2.

It is possible to count the number of interrupt events occurring within a specific time interval. The time interval can be entered in the field "Timer Period" and must be in the range 0 ms (timer disabled) to 1677 ms.

The relevant interrupt channel must be activated by entering a "1" in the field "Count".

The start address from which the count results are to be stored is entered in the field "Count Address".

The count results are in the form of a 16-bit value so that 2 bytes are reserved for each counter. In the example, the count result from interrupt channel 1 would be stored starting at address 182, and the count result from interrupt channel 2 starting from address 184.

Function keys:

F1   *HELP*

displays help text.

F6   *IRQ CONFIGURATION*

chooses the interrupt characteristic (see above).

F10   *PREVIOUS MENU*

returns to master setup menu.

C1100 to C1120 Project Conversion

This menu helps to convert setups saved under a specific project name for the C1100 interface to a C1120 interface project:

```
                                                        25.07.97  12:47:28
  C1100 -> C1120                                                        R

    C1100
    Path and directory    : C:\C1100\SYS
    Project name          : C1100

    C1120
    Project name          : C1120




 F1       F2      F3      F4      F5      F6      F7      F8      F9      F10
 HELP    CONVERT                                                         PREV
                                                                        MENU
```
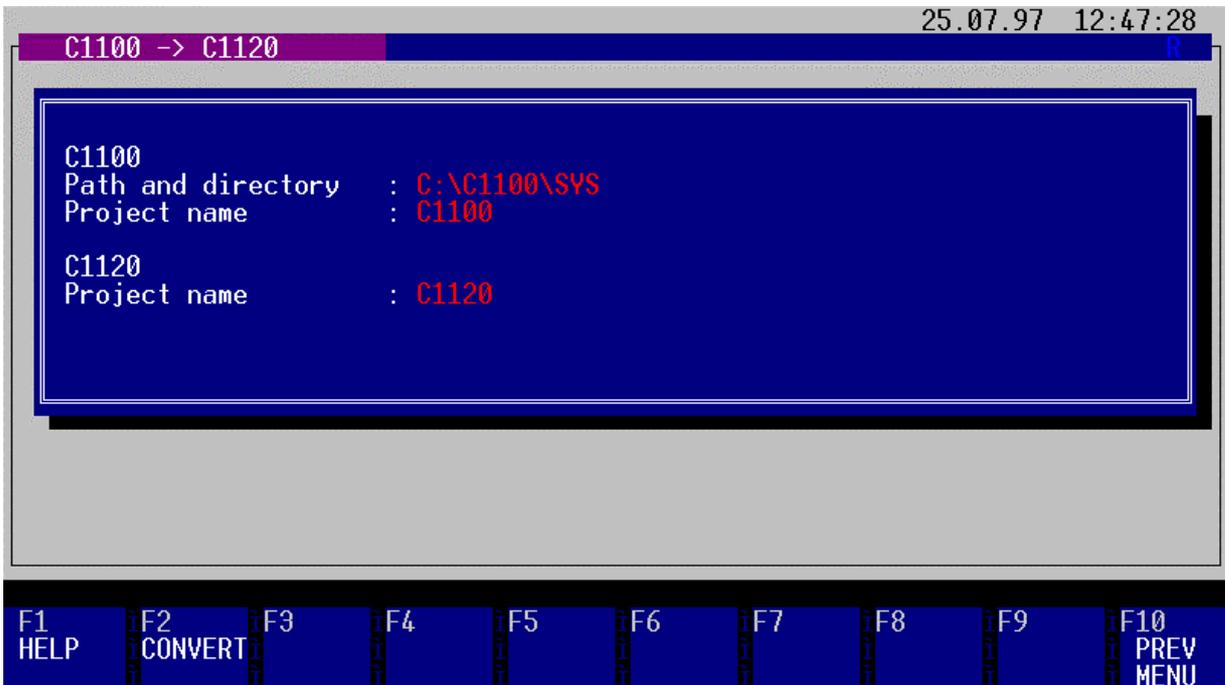
To start conversion, the path, directory name and project name have to be entered in the equivalent lines (e.g. " C:\C1100\SYS\").
The projectname of the C1120 project to be generated is entered in the field C1120 project name. Path and directory of the C1120 project can be changed in the menu "Project Manager"

To start conversion, press "F2".

Parameters of the C1100 which are no longer needed are discarded, others set to default values (see menu "Edit Coniguration").

Function keys:

    F1 *HELP*

        displays help text.

    F2 *CONVERT*

        The conversion is started with this menu.

    F10 *PREVIOUS MENU*

        returns to master setup menu.

Online Menu

For transfer of setups from a PC to the C1120 interface and back, the online menu helps to control communication actions, saving and printing of project setups:

```
                                                    25.07.97  12:51:06
 ONLINE MENU   /  8 MODULS          Projekt Directory   : DEFAULT        R

 No Mod    Description    CDL  D0      D1      D2      D3     Ident STG
  1   1  DIRECT MODULE 1    1  E   23  E   24      0       0     1   0
  2   2  DIRECT MODULE 2    3  A   23  A   24  A   25  A   26     2   0
  3   3  INDIRECT MODULE 1  4  IE   0  IE   0  IA   0  IA   0     3   0
  4   4  INDIRECT MODULE 2  4  IA   0  IA   0  IE   0  IE   0     4   0
  5   5  DIRECT MODULE 3 OUT 3  M    1  K  128  A   21  A   22     5   1
  6   5  DIRECT MODULE 3 IN  2  M    1  K    0  E   25  E   26     5   1
  7   6  STRING MODULE 2    0      0       0       0       0      6   1
  8   7  FAST CDL MODULE 1  5  SA 200  SE 200  SA 201  SE 201     7   0
  9   8  FAST CDL MODULE 2  5  SA 202  SA 203  SE 202  SE 203     8   0
 10   0                    0      0       0       0       0      0   0




                                            Project : DEMO



 F1      F2     F3     F4     F5     F6     F7     F8     F9     F10
 HELP   RESET  FRACT  TRANSM PC ->  C1120              DEBUG  PREV
        C1120  TEST   CONT   C1120  -> PC              MENU   MENU
```

If a communication timeout occurs during or at start of a transfer, first action to be taken should be to check the RS232 interface cable and the serial interface parameters in the menu "Program Parameters".

Function keys:

F1 *HELP*

displays help text.

F2 *RESET C1120*

Generates a software reset of the C1120 interface. The interface boots and runs through following steps:

-       self test of the C1120 interface,

-       the configuration saved in the EEPROM memory is loaded and activated,

-       the II/O-Lightbus ring is reset.

The status of the C1120 is displayed after completion of the reset in the status line. This function can be activated only while the PLC is in STOP mode.

F3   *FRACT TEST*

This menu command tests the II/O-Lightbus ring and reports the number of integrated modules or - in case of errors - the location of a ring interruption.

F4   *TRANSMIT CONTROL*

With this test it is possible to take the II/O-Lightbus ring under observation, e.g. to find a ring fault: After start of this test, all modules from the C1120 interface to the ring interruption show the "CYCLE" LED. After the ring interruption, the "CYCLE" LED of modules is off, possibly showing the red "ERROR" LED. Switching   back   to   standard   mode   is   done   with   a   RESET. During the TRANSMIT CONTROL, the PLC must reside in STOP mode.

F5   *PC -> C1120*

Transmits the contents of the I/O list to the C1120 interface. The interface will work properly only after completion of this download, followed by a RESET or cold boot. During download, the PLC must reside in STOP mode.

F6   *C1120 -> PC*

Reads the actual I/O configuration from a C1120 interface.

F9   *DEBUG MENU*

Changes to the debug menu. Occuring II/O-Lightbus errors are reported here.

F10 *PREVIOUS MENU*

returns to master setup menu.

Debug Menu

The debug menu helps to analyze the status and quality of the II/O-Lightbus ring. Two tables show the parity error and status information:

```
                                              25.07.97  12:51:47
   IIO DEBUG MENU                                              R

  ═NoD═ModD═Parity Errors═            ═ C1120 IIO Error Status ═
     1│  1│      0
     2│  2│      0              Errormask      :     00 h
     3│  3│      0              Errorcount     :      0
     4│  4│      0              Error Rec1     :      0
     5│  5│      0              Error Rec2     :      0
     6│  6│      0              Timeout Error  :      0
     7│  7│      0              Parity Error   :      0
     8│  8│      0              A/C Error      :      0
     9│  0│      0              Module A/C     :      0
    10│  0│      0
  Â                          Â


 F1       F2       F3       F4       F5       F6      F7       F8       F9       F10
 HELP                                         IIO                               PREV
                                            ERRORS                              MENU
```
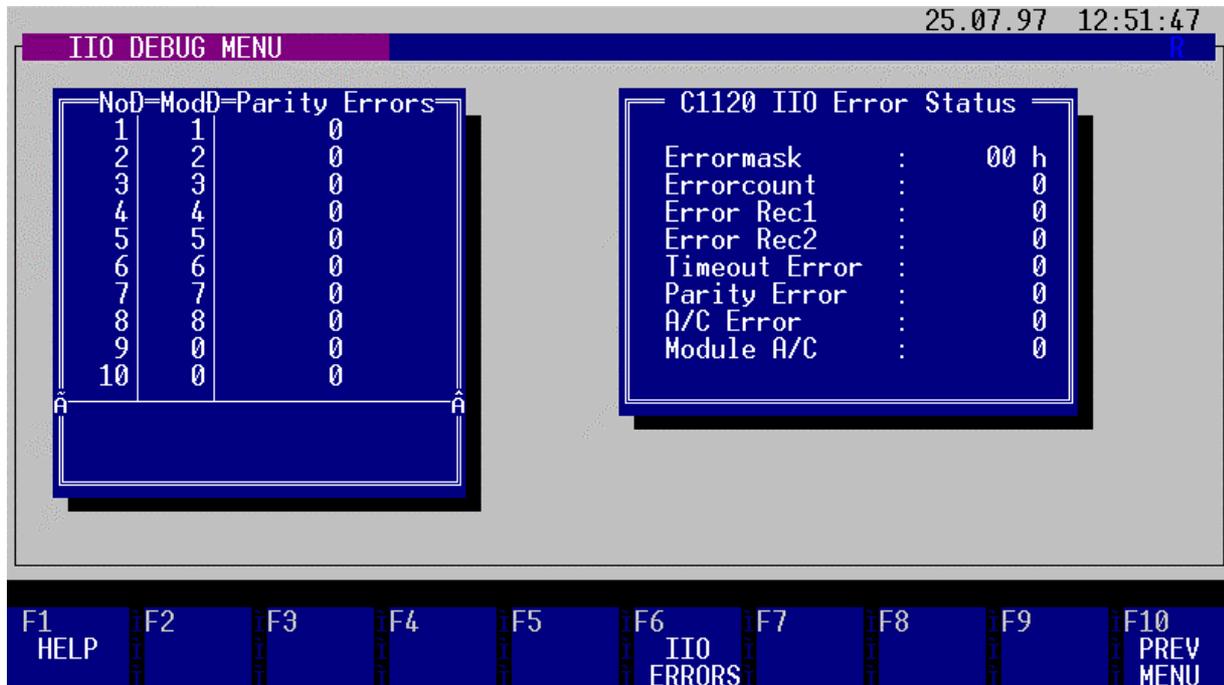
The parity error table allows to analyze and identify the location of parity error sources. To use this option, II/O-Lightbus modules must be configured with SPROMS of type "132".
The II/O error status table shows an overview of all occured I/O errors.

    Function keys:
  F1 *HELP*

      displays help text.

  F6 *IIO ERRORS*

      The display is refreshed to actual status by pressing "F6".

  F10 *PREVIOUS MENU*

      returns to master setup menu.

How to get started - setting up an I/O list

- Connect PC with the C1120 interface with the interface cable.

- Power on PLC and PC: PLC must reside in STOP mode, II/O-Lightbus ring has to be closed before Power on.

- Start PC program for C1120 configuration.

- Check the setup of the serial port with the help of the setup menu.

- Change to the master setup menu.

- Edit the I/O-list: Enter the modules in the order of occurence in the II/O-Lightbus ring. Enter the PLC-I/O-addresses.

- Save the configuration in a file with the name of the field "filename". (At first installation and at start of the program, this file is named DEFAULT.IOL).

- Change to the online menu.

- Force a download to transfer the I/O-list to the C1120-interface.

- Reset the C1120 interface to start with the new configuration.

- set S5-PLC to run mode: force the S5-PLC to read the I/O configuration at start. The C1120- configuration is recognized by the PLC.

Status register S5 / C1120

The C1120 interface occupies the addresses PB/PY 250 to PB/PY 255 by default. This setup is configurable. By generating a single transfer to peripherial byte PB/PY 255 (T PB 255) the C1120 interface is interrupted for a single request. The peripherial byte PB/PY 254 is the status register C1120.

S5 input status (readable with the command L PB 254)

Bit 0 :   ACKN : acknowlege "single request II/O-Lightbus cycle finished"

Bit 1 :   LIFE : This status bit toggles before transmission of I/O data to and from the modules on the I/O list. By monitoring the LIFE bit in the STEP 5 program it is possible to supervise the transmission of information to the indirect modules, especially in case of short PLC cycle times.

Bit 2 :   LWL-ERROR : This bit is set, if an error occurs in the II/O-Lightbus System. Depending on the configuration of the field "error request" the PLC reacts with a change to STOP mode ("error request" = "0") or not ("error request" = "1").

Bit 3 :   Local error on BK2000 module

Bit 4 :   INPUT-VALID : indicates the input data to be valid after reset or program start. The bit is set after complete initialization of the II/O-Lightbus System and stays to be logic "1" afterwards.

S5 Output status (writeable with the command T PB 254)

Bit 0:   Strobe bit for a single request.

Bit 1:   Cycle mode ON ("0") or OFF ("1").

By setting this bit to "1", the cycle mode transmissions are stopped. Inputs and Outputs are accessible only by single requests, until the cycle mode is enabled again.

Bit 2:   Free running mode (bit processing only)

The free running mode disables the cycle mode. Information is transmitted in an asynchronous way on the II/O Lightbus ring. Data bytes, which belong together, have to be transmitted via the single request. The life bit is passive in this mode.

Parallel Communication Channel

The parallel channel is used to start service functions of the C1120 interface. The channel occupies the addresses 250 to 253 by default. This setup can be changed to any address between 128 and 255.
The following information structure is available (shown for PB/PY default):

> PB/PY 253 = parallel channel handshake
> PB/PY 252 = parallel channel function number
> PB/PY 251 = parallel channel argument 1
> PB/PY 250 = parallel channel argument 2

The handshake is carried out with the peripherial address PB/PY 253 or equivalent. Following control bits represent status information to both sides (S5 --> C1120 and C1120 --> S5):

> Bit 253.7:   strobebit for parallel handshake
> Bit 253.6:   acknowlege bit for parallel handshake

The PLC is always the master of the communication via the parallel channel: the function call is handed to the C1120 interface. The C1120 responds with data belonging to the function call.

How to program a parallel channel communication:

a.) Request of the Siemens PLC to the C1120 interface (master is transmitter)

1.   Write function number to PB/PY 252

2.   Write argument 1 to PB/PY 251

3.   Write argument 2 to PB/PY 250

4.   Set strobe bit PB/PY 253.7

5.   Wait for C1120 acknowlege bit PB/PY 253.6 to be "1" (function is started by C1120 interface)

6.   Reset strobe bit PB/PY 253.7

7.   Wait for C1120 acknowlege bit PB/PY 253.6 to be "0" (end of handshake cycle).

b.) Answer of the C1120-interface to the Siemens PLC (master is receiver)

1.   C1120 sets strobe bit PB/PY 253.7 after receipion of a function call as described under a): Valid data bytes are ready to be read.

2.   Read data: The function number is represented in PB/PY 252,
      argument 1 is represented in PB/PY 251,
      Argument 2 is represented in PB/PY 250.

3.   Set acknowlege bit PB/PY 253.6 at end of data read.

4.   C1120 interface resets strobe bit PB/PY 253.7.

5.   End handshake cycle by resetting acknowlege bit PB/PY 253.6.

All steps of the handshake have to take place in the above described order. All function calls are carried out with full handshake.

Several special functions are available for the PLC via the parallel communication channel:

Function-nr 48 = 30H		
II/O-Lightbus Error status request		
Request from PLC	**Argument 1**	**Argument 2**
	----	----
Reply from C1120 Interface	**Argument 1**	**Argument 2**
	Error number *)	

Function-nr 53 = 35H		
Reset II/O-Lightbus		
Request from PLC	**Argument 1**	**Argument 2**
	----	----
Reply from C1120 Interface	**Argument 1**	**Argument 2**
	Error number *)	Module number

Function-nr 54 = 36H		
II/O-Lightbus Transmit test		
Request from PLC	**Argument 1**	**Argument 2**
	----	----
Reply from C1120 Interface	**Argument 1**	**Argument 2**
	----	----

Function-nr 55 = 37H		
II/O-Lightbus Interrupt location test		
Request from PLC	**Argument 1**	**Argument 2**
	----	----
Reply from C1120 Interface	**Argument 1**	**Argument 2**
	Error number *)	Module number

Function-nr 56 = 38H		
II/O-Lightbus Loss test		
Request from PLC	**Argument 1**	**Argument 2**
	----	----
Reply from C1120 Interface	**Argument 1**	**Argument 2**
	Error number *)	Module number

Function No. 59 = 3BH		
Reset String Slaves		
Request from PLC	**Argument 1**	**Argument 2**
	Adress of string slave	----
Response from C1120	**Argument 1**	**Argument 2**
	Error number *)	----

*) Error number see table

Table of error numbers:

Error number	Error cause
1	
2 - 9	Intensity test not successful
10 - 12	
13	
14 - 16	
17	No receiption of II/O-Lightbus signals
20 - 21	
22 - 23	
24	
25	Error at address test
26	
27	General fault during II/O-Lightbus initialisation
28	
29	
30	Not allowed ident number was found
31	
32	
33	
34	Number of modules in I/O list does not match number of modules in II/O-Lightbus ring
35	
36	
37	Transmission interrupt in the II/O-Lightbus ring (module number = location of interrupt) *)
38	
39	
40	
41	free running mode disabled after timeout of PLC (PLC in STOP mode)
42	general II/O-Lightbus error
43	adress check error
50	timeout at reset of a string slave
51	slave is not registered as string slave
60	
61	
62	
63	
...	
98	Download successfully ended
99	Transmission test processing

*) Modules are counted from end of ring. If n is answer to function, n modules from end of ring receive valid II/O-Lightbus telegram frames.

Service Routines in STEP 5 language

Following described service routines are available at the moment of issue:

     1.   Function block for single request

     2.   Function block for error status request / reset of II/O-Lightbus System

     3.   Function block for quick process channel

Service Routines in STEP 5 language

Status LEDs

3 Status LEDs are shown on the front panel of the C1120 interface:

    1.   RUN   : If this LED shows the C1120 interface is ready to work.

    2.   CPU-ERR   : Intermitting light indicates mismatch of number of modules in the configuration and II/O-Lightbus ring. Possibly the EEPROM memory is defect.

                                 Uninterrupted light indicates a general interface error. A cold start is recommended prior to change of the interface.

    3.   II/O-ERR   : Intermitting light indicates a general II/O-Lightbus error, which can be analyzed in details or serviced by the special functions.

2.4   Slave Setup

The C1120 interface is able to interface to a PLC behaving as a slave to a Master PLC with C1120 interface. In this configuration, the slave C1120 interface is driven by a (standard) master system, which supervises the II/O-Lightbus. I/O-data transmission and other interesting applications are available in this configuration. Configuring an interface as a slave is done with the help of this menu:

```
                                                  25.07.97  12:57:16
   SLAVE SETUP                                                     R

    Inputs                               Outputs
 No Description    RAM   D0    D1      No Description    RAM   D0    D1
  1 INPUT 0/1      00 E    0 E    1      1 OUTPUT 0/1     00 A    0 A    1
  2 INPUT 2/3      02 E    2 E    3      2 OUTPUT 2/3     02 A    2 A    3
  3 INPUT 4/5      04 E    4 E    5      3 OUTPUT 4/5     04 A    4 A    5
  4 INPUT 6/7      06 E    6 E    7      4 OUTPUT 6/7     06 A    6 A    7
  5 INPUT 8/9      08 E    8 E    9      5 OUTPUT 8/9     08 A    8 A    9
  6 INPUT 10/11    0A E   10 E   11      6 OUTPUT 10/11   0A A   10 A   11
  7 INPUT 12/13    0C E   12 E   13      7 OUTPUT 12/13   0C A   12 A   13
  8 INPUT 14/15    0E E   14 E   15      8 OUTPUT 14/15   0E A   14 A   15
  9 INPUT 16/17    10 E   16 E   17      9 OUTPUT 16/17   10 A   16 A   17
 10 INPUT 18/19    12 E   18 E   19     10 OUTPUT 18/19   12 A   18 A   19



                                              Project : DEMO



 F1       F2       F3       F4      F5    F6      F7      F8      F9      F10
 HELP     EDIT     EDIT     EDIT          PROJ    PRINT   SAVE    ONLINE  PREV
          INP      OUTP     CONFIG        MANAG   PROJ    PROJ    MENU    MENU
```

The menu offers two tables, a status line and the usual function keys:

Function keys:

F1   *HELP*

   displays help text.

F2   *EDIT INPUTS*

   changes to the menu to edit the input data table.

F3   *EDIT OUTPUTS*

   changes to the menu to edit the output data table.

F4   *EDIT CONFIGURATION*

   changes to the menu to edit the slave configuration.

F6 *PROJECT MANAGER*

the slave project manager is under development.

F7 *PRINT (SLAVE) PROJECT*

the print function is under development.

F8 *SAVE PROJECT*

saves the configuration to the hard disc.

F9 *ONLINE MENU*

changes to the online menu.

F10 *PREVIOUS MENU*

changes to the main menu.

Edit Inputs

This menu helps editing the input data for the PLC. Output data are edited with a special menu. The field "No" shows the line number of the table, "description" shows a text edited by the user. The field "RAM" shows the offset address of the slave receive buffer. The fields "D0", "D1" hold the PLC input addresses for the data in the RAM offset addresses of the slave receive buffer.

```
                                                          25.07.97  12:57:50
   SLAVE SETUP                                                           R

       Inputs                              Outputs
   No─Description──RAM──D0────D1─     No─Description──RAM──D0────D1─
    1 INPUT  0/1    00 E   0 E    1     1 OUTPUT  0/1    00 A   0 A    1
    2 INPUT  2/3    02 E   2 E    3     2 OUTPUT  2/3    02 A   2 A    3
    3 INPUT  4/5    04 E   4 E    5     3 OUTPUT  4/5    04 A   4 A    5
    4 INPUT  6/7    06 E   6 E    7     4 OUTPUT  6/7    06 A   6 A    7
    5 INPUT  8/9    08 E   8 E    9     5 OUTPUT  8/9    08 A   8 A    9
    6 INPUT  10/11  0A E  10 E   11     6 OUTPUT  10/11  0A A  10 A   11
    7 INPUT  12/13  0C E  12 E   13     7 OUTPUT  12/13  0C A  12 A   13
    8 INPUT  14/15  0E E  14 E   15     8 OUTPUT  14/15  0E A  14 A   15
    9 INPUT  16/17  10 E  16 E   17     9 OUTPUT  16/17  10 A  16 A   17
   10 INPUT  18/19  12 E  18 E   19    10 OUTPUT  18/19  12 A  18 A   19


                                           Project : DEMO



   F1        F2       F3     F4      F5     F6      F7      F8      F9     F10
   HELP                      INS     DEL                                  PREV
                             LINE    LINE                                 MENU
```

Before inserting a new line with key "F4", no line can be edited.

    Function keys:

  F1   *HELP*

      displays help text.

  F4   *INSERT LINE*

      inserts a new line at the actual cursor position. Following line numbers are incremented.

  F5   *DELETE LINE*

      deletes a line at the actual cursor position. Following line numbers are decremented.

  F10 *PREVIOUS MENU*

      changes to the main menu.

Edit Outputs

This menu helps editing the output data for the PLC. Output data are edited with a special menu. The field "No" shows the line number of the table, "description" shows a text edited by the user. The field "RAM" shows the offset address of the slave transmit buffer. The fields "D0", "D1" hold the PLC output addresses for the data in the RAM offset addresses of the slave transmit buffer.

Before inserting a new line with key "F4", no line can be edited.

Function keys:

F1 *HELP*

   displays help text.

F4 *INSERT LINE*

   inserts a new line at the actual cursor position. Following line numbers are incremented.

F5 *DELETE LINE*

   deletes a line at the actual cursor position. Following line numbers are decremented.

F10 *PREVIOUS MENU*

   changes to the main menu.

Edit Configuration

This menu is used to edit the configuration data of the C1120 interface.
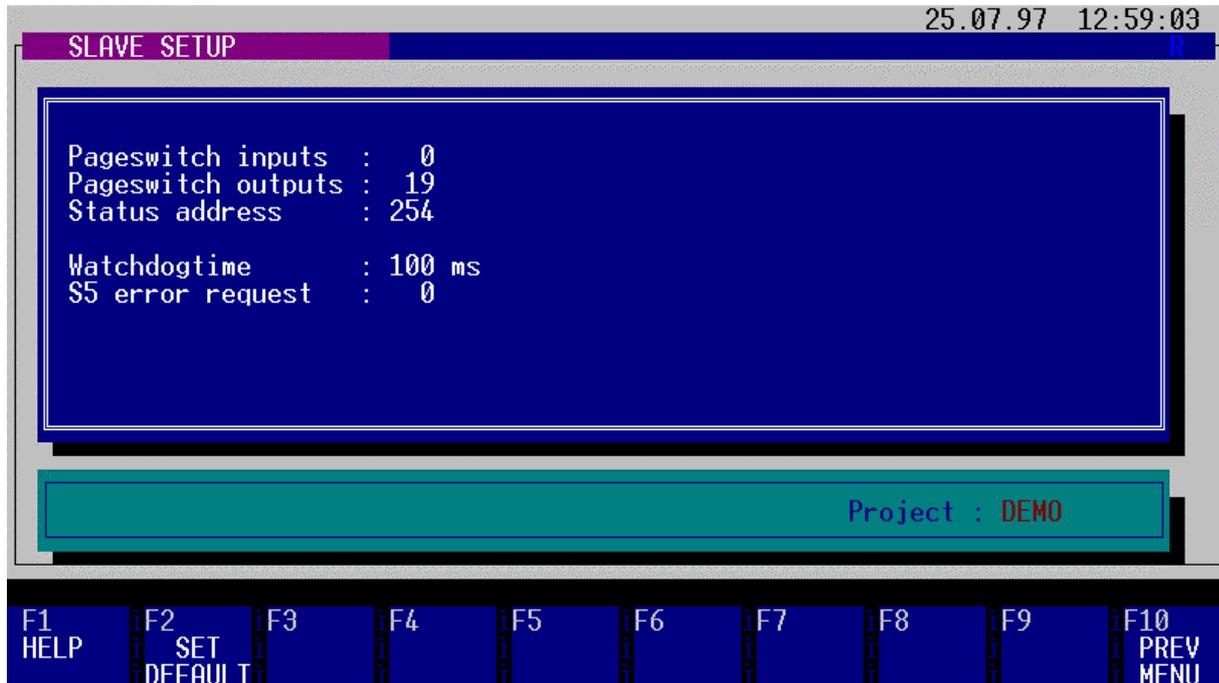
The pageswitch mechanism provides a consistent process image to the PLC at any time of processing: While one process image is switched to the PLC, I/O communication is done with a second process image. The fields "Pageswitch inputs" and "Pageswitch outputs" represent the memory addresses of the I/O bytes which cause a pageswitch when they are accessed, the lowest input and highest output byte by default. Different PLC CPU´s scan the process image either from the lowest or from the highest addresses. The first memory access of the scan should cause a pageswitch for the inputs, the last for the outputs. The default setting is prepared to serve CPU´s, which scan the process image beginning with the lowest address.

The field "Status address" contains the address of the status byte. Following information is reported to the PLC:

Statusbyte.0   : not used
Statusbyte.1   : not used
Statusbyte.2   : II/O-Lightbus Timeout error flag
Statusbyte.3   : not used
Statusbyte.4   : Inputs valid flag
Statusbyte.5   : not used
Statusbyte.6   : not used
Statusbyte.7   : not used

The indication of an II/O-Lightbus timeout can be configured with the help of the configuration field "watchdog time". If during the choosen time interval no valid Lightbus telegram is being received, an error status event is reported equivalent to the setup field "S5 error request". By setting the field "watchdog time" to value "0", the watchdog is disabled.

Setting the field "S5 error request" to value "0" (default) results in switching the PLC to STOP mode with an acknowlege delay by deleting the addresses of the I/O bytes in the dual port memory of the C1120 interface. The acknowlege delay event can be managed by the PLC by programming the OB 23 and 28.

Setting the field "S5 error request" to value "1" results in leaving the I/O addresses undeleted. A static display of the last I/O status remains in the process image unchanged. The status byte reports an error by setting the error flag, anyway.

Function keys:

F1   *HELP*

displays help text.

F2   *SET DEFAULT*

sets the configuration to default values.

F10   *PREVIOUS MENU*

changes to the main menu.

IMPORTANT REMARK regarding the page number:

The page number for data exchange with the PLC is configurable, beginning with interface version numbers **above** V 1.51. Up to Version 1.51, the page number for data exchange is 0 by default.

Online Menu

This menu is used to communicate between the configuration PC and the C1120 interface:
Upload and download of setups is managed.

```
                                                          25.07.97  12:59:59
  ONLINE MENU                                                              R

    Inputs                                    Outputs
 No Description    RAM   D0     D1        No Description    RAM   D0     D1
  1 INPUT  0/1     00 E    0 E    1         1 OUTPUT  0/1    00 A    0 A    1
  2 INPUT  2/3     02 E    2 E    3         2 OUTPUT  2/3    02 A    2 A    3
  3 INPUT  4/5     04 E    4 E    5         3 OUTPUT  4/5    04 A    4 A    5
  4 INPUT  6/7     06 E    6 E    7         4 OUTPUT  6/7    06 A    6 A    7
  5 INPUT  8/9     08 E    8 E    9         5 OUTPUT  8/9    08 A    8 A    9
  6 INPUT  10/11   0A E   10 E   11         6 OUTPUT  10/11  0A A   10 A   11
  7 INPUT  12/13   0C E   12 E   13         7 OUTPUT  12/13  0C A   12 A   13
  8 INPUT  14/15   0E E   14 E   15         8 OUTPUT  14/15  0E A   14 A   15
  9 INPUT  16/17   10 E   16 E   17         9 OUTPUT  16/17  10 A   16 A   17
 10 INPUT  18/19   12 E   18 E   19        10 OUTPUT  18/19  12 A   18 A   19



                                                      Project : DEMO


 F1       F2       F3       F4       F5       F6       F7       F8       F9       F10
 HELP     RESET                      PC ->    C1120                              PREV
          SLAVE                      C1120    -> PC                              MENU
```

Function keys:

F1 *HELP*

displays help text.

F2 *RESET SLAVE*

Resets the C1120 interface, processing following steps:

-       self test of the C1120 interface,

-       activation of the configuration stored in the EEPROM memory.

The status of the C1120 interface is displayed in the status line after the reset. This
function only takes place, if the PLC is residing in STOP mode.

F5 *PC -> C1120*

Transmits the configuration data to the C1120 interface. The interface is able to
process propperly under following circumstances: A correct configuration is
transmitted, afterwards a reset or cold start is forced. During this procedure, the
PLC has to reside in STOP mode.

F6   *C1120 -> PC*

Reads the actual configuration from the C1120 interface to the PC.

F10 *PREVIOUS MENU*

changes to the main menu.

2.5 Project Manager

With the help of this menu, different setups can be managed under the name of projects:

```
                                              25.07.97  13:03:48
  ┌ Project Manager                                          R  ┐

                    ┌ Directory ┐              ┌ Project ┐
                    │ DEFAULT   │              │ DEMO.IOL │

              ┌─────────── Project List ───────────┐
              │ 0   DEFAULT.IOL 15-04-96 10:32      │
              │ 1      DEMO.IOL 25-07-97 12:40      │
              │ 2    DEMO01.IOL 22-12-94 14:46      │
              │                                     │
              │                                     │
              │                                     │
              │                                     │
              │                                     │
              └─────────────────────────────────────┘

  F1     F2     F3     F4     F5     F6     F7     F8     F9     F10
  HELP   SET    CHG    MAKE   DEL    OPEN   MAKE   DEL    COPY   PREV
         PATH   DIR    DIR    DIR    PRJ    PRJ    PRJ    PRJ    MENU
```
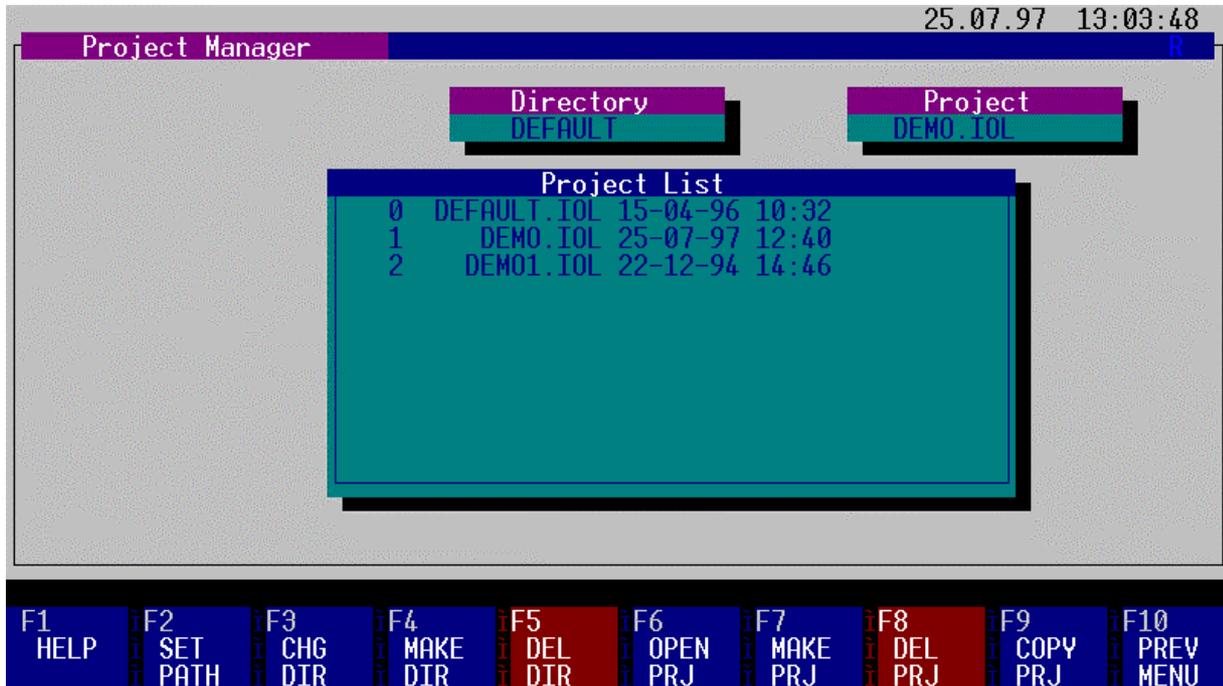
Function keys:

F1 *HELP*

displays help text.

F2 *SET PATH*

changes to new drive path for project file.

F3 *CHANGE DIRECTORY*

changes to new directory in a path for project file.

F4 *MAKE DIRECTORY*

generates a new directory in a path for project file.

F5 *DELETE DIRECTORY*

deletes an empty directory.

F6   *OPEN PROJECT*

Loads a project from the actual directory.

F7   *MAKE PROJECT*

generates a new project in the actual directory.

F8   *DELETE PROJECT*

deletes a project from the actual directory.

F9   *COPY PROJECT*

Copies a project from the actual directory to any path and/or directory.

F10 *PREVIOUS MENU*

returns to master setup menu.

2.6   System Configuration

System Entry

Pressing F10 from the main menu leads to the system entry menu, from here the user can choose the menus DOS, SYSTEM and PROGRAM PARAMETER.

```
                                                        25.07.97  13:04:21
   SYSTEM ENTRY                                                         R




F1        F2      F3     F4     F5     F6     F7     F8     F9      F10
 HELP     DOS     SYS                                      PROG     PREV
                                                          PARAM    MENU
```
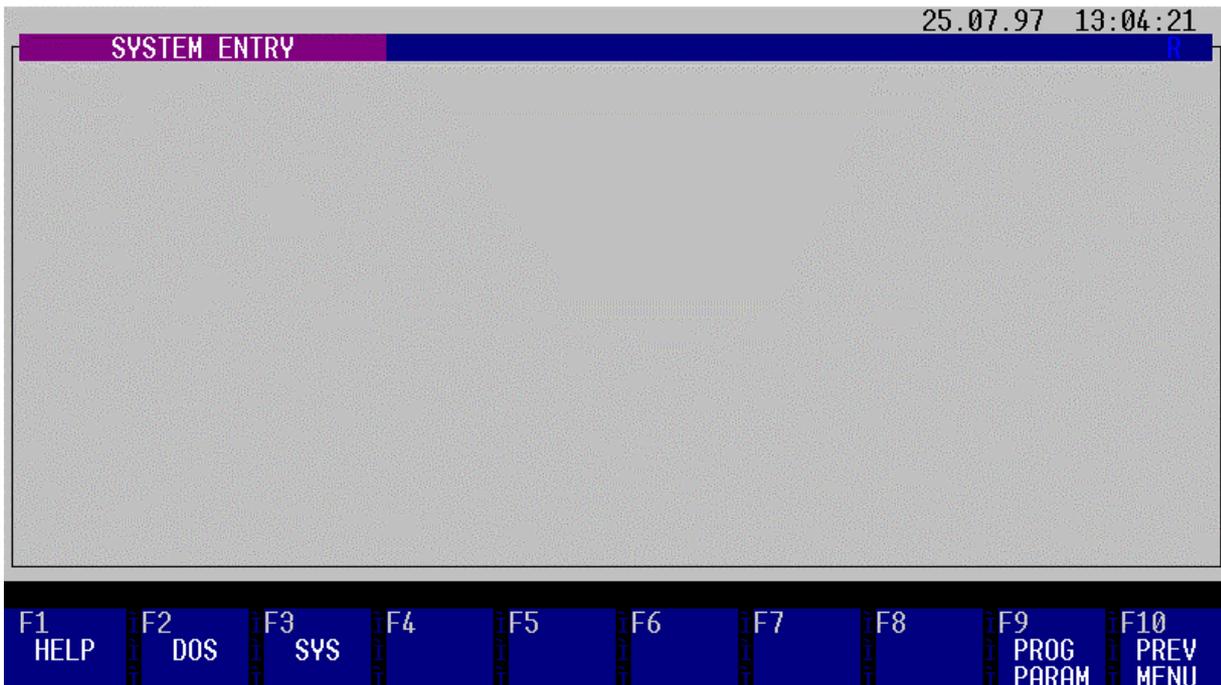
Function keys:

F1   *HELP*

displays help text.

F2   *DOS*

Opens a DOS shell.

F3   *SYSTEM*

offers the submenus language and logfile.

F9   *PROGRAM PARAMETER*

contains the configuration parameters of the configuration software.

F10 *PREVIOUS MENU*

returns to master setup menu.

System

This menu offers the submenus LANGUAGE and LOGFILE.
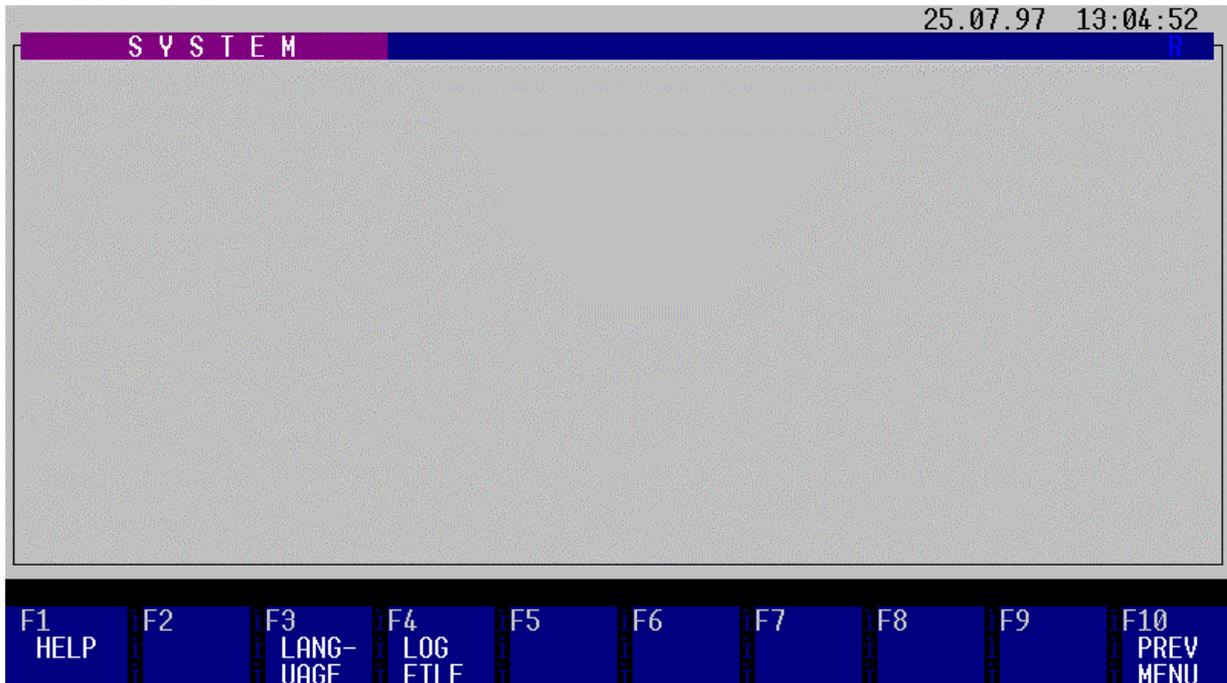
Function keys:

F1   *HELP*

displays help text.

F3   *LANGUAGE*

offers the submenu LANGUAGE to choose different language options.

F4   *LOG FILE*

offers the submenu LOG FILE containing status history information.

F10 *PREVIOUS MENU*

returns to master setup menu.

Language

This menu is used to change the actual menu language during program execution:
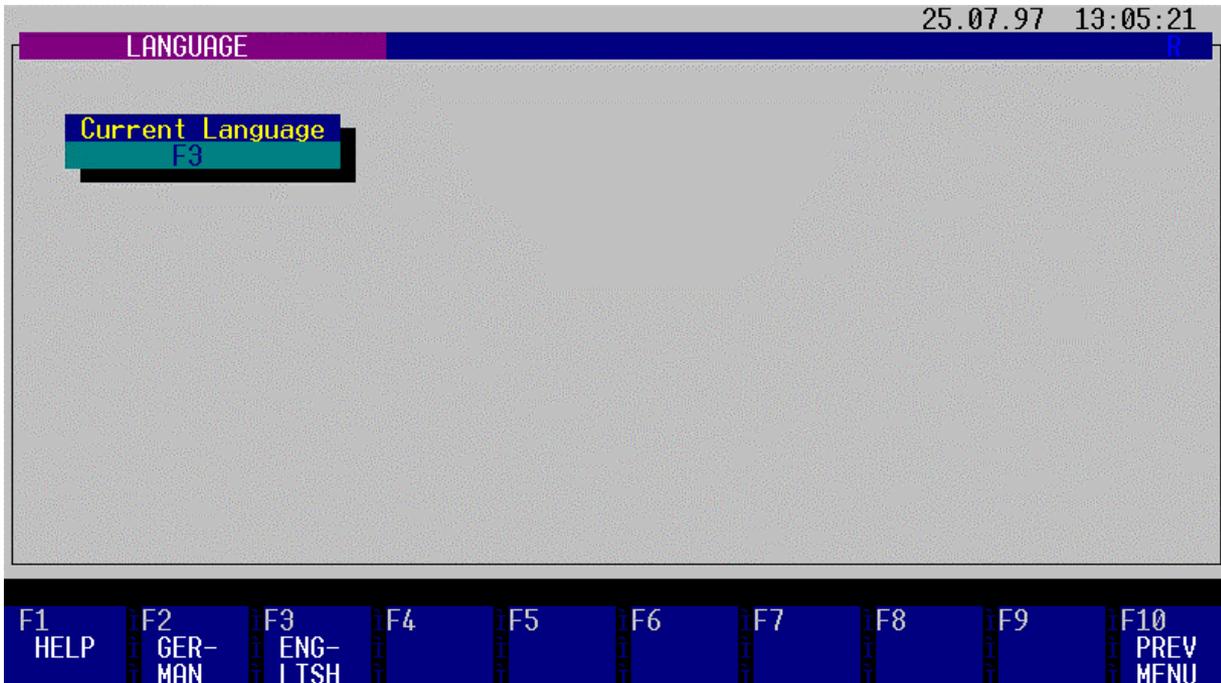
  Function keys:

 F1 *HELP*

   displays help text.

 F2 *GERMAN*

   switches to german language menu.

 F3 *ENGLISH*

   switches to english language menu.

 F10 *PREVIOUS MENU*

   returns to master setup menu.

Log File

With the help of this menu the logfile can be displayed to review the event history:

```
                                                          25.07.97  13:05:45
        LOG FILE                                                          R

 Date      Time            Text
 25.07.97 12:23:35 => PROGSTART
 25.07.97 12:39:50 File E:\CONFIGSW\C1120\DEFAULT\DEMO.IOL written ...
 25.07.97 12:39:59 File E:\CONFIGSW\C1120\DEFAULT\DEMO.IOL written ...
 25.07.97 12:48:20 => PROGEND
 25.07.97 12:49:22 => PROGSTART
 25.07.97 13:00:53 => PROGEND
 25.07.97 13:03:19 => PROGSTART




 F1       F2       F3       F4       F5       F6       F7       F8       F9       F10
 HELP                               COPY                                         PREV
                                    LOG                                          MENU
```

Function keys:

F1 *HELP*

displays help text.

F5 *COPY LOGFILE*

Copies the file 'PROGRAM.LOG' to the drive set in the menu "Programm Parameter" (floppy, etc.).

F10 *PREVIOUS MENU*

returns to master setup menu.

Program Parameter

The configuration for the configuration program for the C1120 interface is set and stored with the help of this menu:

```
                                                    25.07.97  13:06:17
  PROGRAM PARAMETERS                                              R

     Configuration



   Language:       1
   Printer Port:   LPT1    Com Port:     COM2      LCD-Display:       0
   Harddisk:       E       Floppy:       A




 F1      F2      F3      F4      F5      F6      F7      F8      F9      F10
 HELP                                                            SAVE    PREV
                                                                 PAGE    MENU
```
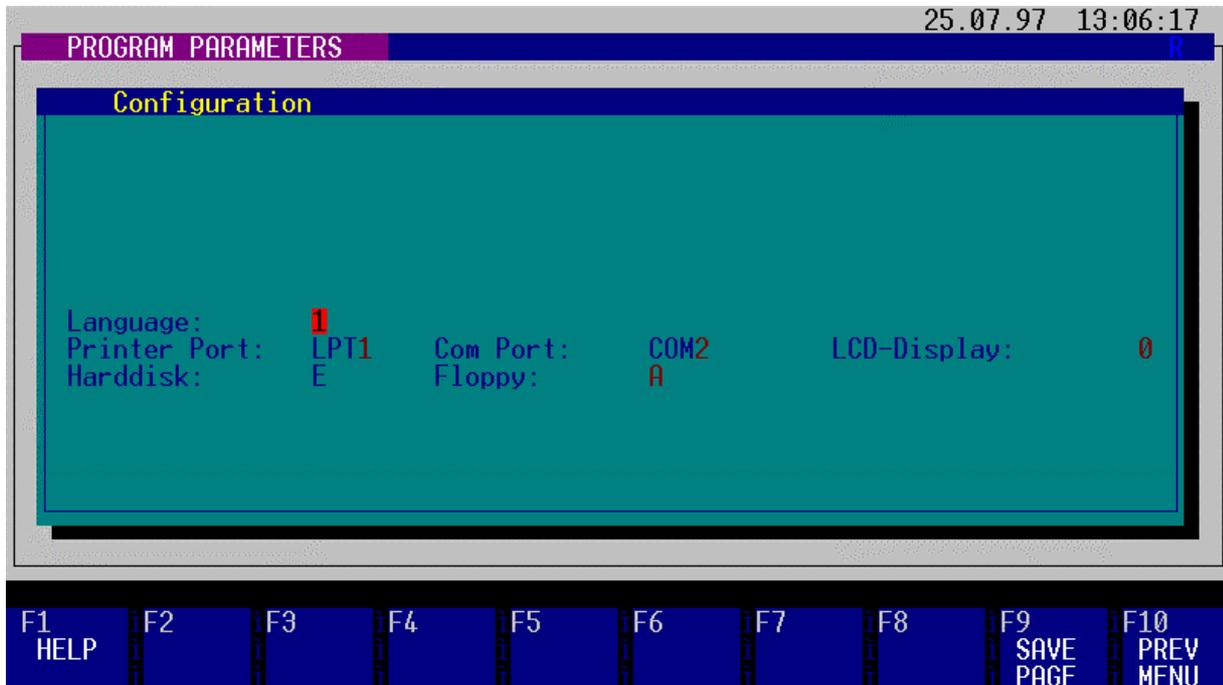
It is possible to move the cursor through the mask to access and change parameters of the program.
The field "Language" is used to set the default language to german ("0") or english ("1").
The parallel and serial port is configured by changing the port number in the equivalent fields.
A "1" in the field "LCD-Display" sets a display color set for LCD requirements.
The fields "Harddisc" and "Floppy" show the actual active drives.

Function keys:

F1 *HELP*

displays help text.

F9 *SAVE PAGE*

saves the setting to the configuration file.

F10 *PREVIOUS MENU*

returns to master setup menu.

3   C1120 Interface: Technical Data

CPU	80C166 Communication processor	
memory		

Ports	COM1	serial port
		    eqiv. RS232 C or 20 mA current loop
		    occupied by the configuration program

Field bus	Beckhoff II/O-Lightbus System	
Transmission rate	2,5 MBaud, 32 Bit user data in 25 μs	
Power supply	5V from S5-PLC Bus	
Current consumption	1,5 A from S5-PLC Bus	
Housing	S5 Adaption capsule for intelligent peripherials	

4   Installation Remarks

4.1   Assembly to the S5-PLC rack

1.   Switch off PLC and external power supplies

2.   The C1120 interface should be mounted in a slot for intelligent peripherials or communication processors (slot 0) of the S5- rack CR700-1.

3.   Pull off the blind plug and place the C1120 interface in the slot like any other interface.

No external power supply is necessary for the C1120 interface, it is driven directly from the S5 PLC Bus. The powero n of the interface follows the power on of the PLC. At this time, all fiber optic connections of the Beckhoff Lightbus ring have to be connected to maintain a proper initialization.

4.2   Connecting to a PC

System requirements

For configuration and address initialization of the C1120 interface following equipment is required:

-    An IBM PC/AT or compatible PC with at least 640 kByte memory,

-    a serial port,

-    optional a parallel port,

-    a monochrom- or color monitor and a hercules, EGA- or VGA- compatible graphic adapter,

-    a 5¼" or a 3½" floppy disc,

-    DOS 3.3 or higher or a compatible operating system,

-    a standard serial RS232- cable with 9-pin connector (pinout see annex).

Interface ports for connection with a PC

The interfacing is realized with a standard serial RS232- cable with 9-pin connector (pinout see annex) for the port connector of the C1120 interface.

5   C1120 Serial Port Pinout

Pinout of RS232 C / current loop port (9-pin SUB-D connector on front of C1120)		
Pin	**Signal**	**Port**
1	TXD	RS232 C COM2:
2	TXD	RS232 C COM1:
3	RXD	RS232 C COM1:
4	RXD	RS232 C COM2:
5	Signal GND	-
6	TXD	20mA+ COM1:
7	TXD	20mA- COM1:
8	RXD	20mA+ COM1:
9	RXD	20mA- COM1: