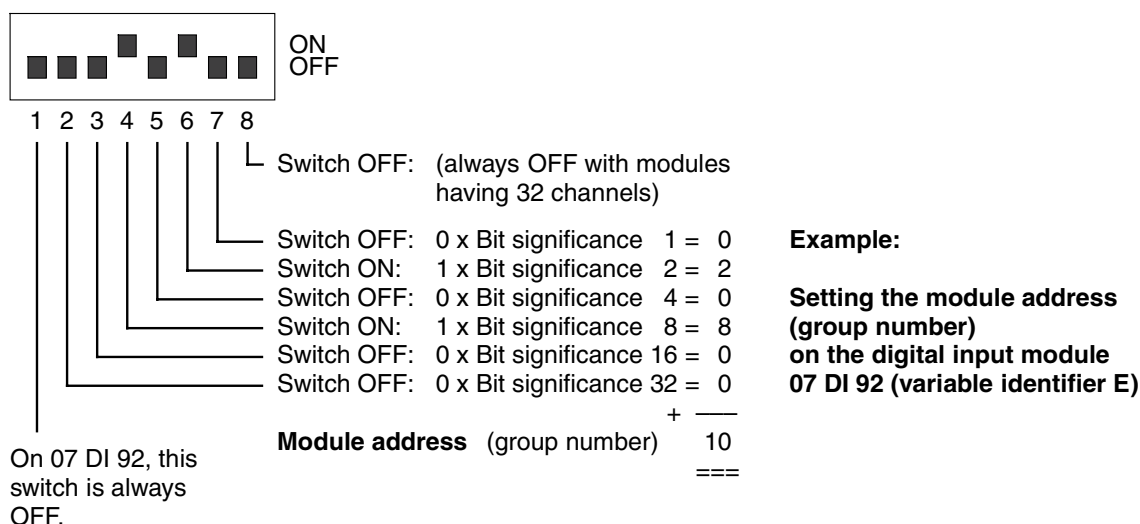


Structure of the input and output addresses in the remote modules

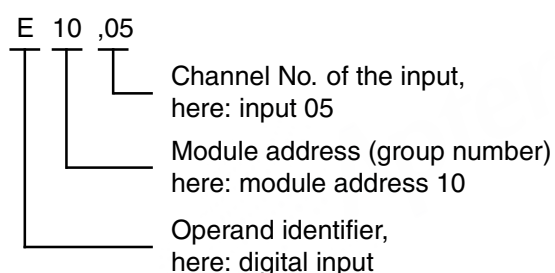
To enable the basic unit to correctly access the inputs and outputs, an address must be set for every module on the bus.

As an example, the binary input module **07 DI 92** is introduced here.

The address setting is done with the DIL switch located under the slide cover on the right hand side of the module housing (meaning of the 8 switches, see below).



The bus master basic unit reads the input signals as operands. The hardware identifier and the complete address of the input signal have the following structure:



In the programming system 907 AC 1131 the input declaration is performed as follows:

E10_05_switch1 AT %IX10.5 : BOOL; (* Switch 1 *)

Any symbolic identifier (here E10_05_switch1) and comment can be used.

The following table shows the input channel allocations which result from the use of the central unit 07 KT 97 as bus master.

Terminal	Input	Address	Terminal	Input	Address
5	E n,00	%lxn.00	30	E n+1,00	%lxn+1.00
6	E n,01	%lxn.01	31	E n+1,01	%lxn+1.01
7	E n,02	%lxn.02	32	E n+1,02	%lxn+1.02
8	E n,03	%lxn.03	33	E n+1,03	%lxn+1.03
9	E n,04	%lxn.04	34	E n+1,04	%lxn+1.04
10	E n,05	%lxn.05	35	E n+1,05	%lxn+1.05
11	E n,06	%lxn.06	36	E n+1,06	%lxn+1.06
12	E n,07	%lxn.07	37	E n+1,07	%lxn+1.07
15	E n,08	%lxn.08	40	E n+1,08	%lxn+1.08
16	E n,09	%lxn.09	41	E n+1,09	%lxn+1.09
17	E n,10	%lxn.10	42	E n+1,10	%lxn+1.10
18	E n,11	%lxn.11	43	E n+1,11	%lxn+1.11
19	E n,12	%lxn.12	44	E n+1,12	%lxn+1.12
20	E n,13	%lxn.13	45	E n+1,13	%lxn+1.13
21	E n,14	%lxn.14	46	E n+1,14	%lxn+1.14
22	E n,15	%lxn.15	47	E n+1,15	%lxn+1.15

07 DI 92: Addressen of the 32 input channels

n: Module address, can be set with the switches 2...7 on the address DIL switch.
 Recommended module addresses for the use of 07 KT 97 as bus master:
 08, 10, 12.....60 (even-numbered addresses)

The module seizes 2 addresses for inputs on the CS31 system bus.

The switches 1 and 8 of the address DIL switch must be set to OFF.



Note:

Some other modules may have a more or less different address setting. See the following chapters.

5.2 Recommended module addresses on the CS31 system bus

The standard addressing has the purpose of

- simplifying and schematizing the setting of addresses on the CS31 system bus and
- simplifying the diagnosis and troubleshooting.

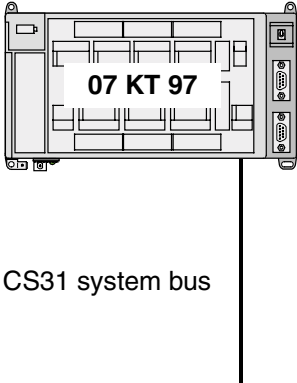
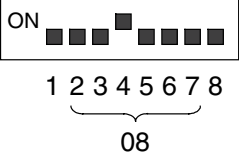
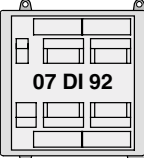
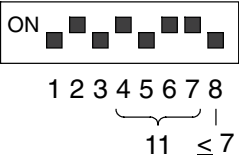
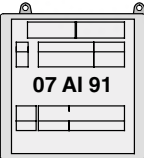
The standard addressing makes sure that there will be no address overlappings even for modules with a higher amount of data.

Recommendation:

- Assign a specific module address for each module / each slave basic unit. That means the giving up of the possibility of a double assignment of module addresses by digital and analog modules.
- Module addresses 8, 10, ..., 58, 60 for digital remote modules and basic units (only even-numbered addresses). Refer also to chapter 1.4.6 "Intelligent I/O remote modules (basic units) as slave on the CS31 system bus".
- Module addresses 0...5 and 8...15 for analog remote modules.

Examples for the assignment of module address

Example 5:

 CS31 system bus		07 KT 97 E 62,00 / %IX62.0 : E 62,15 / %IX62.15 E 63,00 / %IX63.0 : E 63,15 / %IX63.15 A 62,00 / %QX62.0 : A 62,15 / %QX62.15 A 63,00 / %QX63.0 : A 63,07 / %QX63.7 EW 06,00 / %IW1006.0 : EW 06,07 / %IW1006.7 AW 06,00 / %QW1006.0 : AW 06,03 / %QW1006.3 Addresses of the inputs and outputs on the bus master basic units		Bus master basic unit
Address switch (DIL switch) on the module	Remote module	Address in the program of the master CPU		Remote modules (slaves)
 ON 1 2 3 4 5 6 7 8 08 32 digital inputs		E 08,00 / %IX8.0 : E 08,15 / %IX8.15 E 09,00 / %IX9.0 : E 09,15 / %IX9.15	1st digital input : 32nd digital input	
 ON 1 2 3 4 5 6 7 8 11 ≤ 7 8 analog inputs		EW 11,00 / %IW1011.0 EW 11,01 / %IW1011.1 : EW 11,07 / %IW1011.7	1st analog input 2nd analog input : 8th analog input	

Example 6:

See next page

07 KT 97 Address setting in the master: KW 00,00 / %MW3000.0 = -1 E 62,00...E 62,15 E 63,00...E 63,15 A 62,00...A 62,15 A 63,00...A 63,07 EW 6,00...EW 6,07 AW 6,00...AW 6,03 Inputs / outputs on the basic unit			
Address switch on the remote module	Remote module	Address in the program of the master CPU	Remarks
ON 1 2 3 4 5 6 7 8 03 ≤ 7	07 AI 91 8 inputs analog E0 : E7	EW 03,00 %IW1003.0 : EW 03,07 %IW1003.7	– Permissible range of module addresses for analog modules: 0...5 and 8...15
ON 1 2 3 4 5 6 7 8 03 > 7	07 AI 91 8 inputs analog E0 : E7	EW 03,08 %IW1003.8 : EW 03,15 %IW1003.15	– 2 analog input modules with 8 channels each can be assigned to one address (16 channels together).
ON 1 2 3 4 5 6 7 8 09 ≤ 7	07 AC 91 8 outputs analog 8 inputs analog A0 : A7 E0 : E7	AW 09,00 %QW1009.0 : AW 09,07 %QW1009.7 EW 09,00 %IW1009.0 : EW 09,07 %IW1009.7	– The same address (as for the analog input modules) may also be used for the connection of analog output modules (as shown to the left).
ON 1 2 3 4 5 6 7 8 12 ≤ 7 07 KT 97: KW 0,0 / %MW3000.0 = 4	07 DI 92 32 inputs digital E00 : E31	E 12,00 %IX12.0 : E 12,15 %IX12.15 E 13,00 %IX13.0 : E 13,15 %IX13.15	– Permissible range of module addresses: for digital modules: 0...61, recommendation: 6...60 – The following might be done, but does not bring you any advantage: - using the same addresses for digital modules as for analog modules - collecting input and output under one address
up to 120 digital inputs and up to 120 digital outputs or up to 8 word inputs and up to 8 word outputs	KR/KT in the digital range: E 04,00...E 11,07 / %IX4.0...%IX11.7 A 04,00...A 11,07 / %QX4.0...%QX11.7 or KR/KT in the word range: EW 04,00...EW 04,07 / %IW1004.0...%IW1004.7 AW 04,00...AW 04,07 / %QW1004.0...%QW1004.7	– Slave-KR/KT with 120 E and/or 120 A occupies the set and the following 7 addresses (only half of the 7th, though). For address 4 of the example: - Next free address for KT: Bit range: 12, word range: 5 - Max settable KT address: Bit range: 54, word range: 5	

All error messages are stored in the module and can only be deleted by pressing the test button for 10 seconds or by switching the power OFF and ON.

Self test:

During the initialization phase, a self test is performed in the remote module. With a negative result, the module lights ON the error LED and **does not contact** the CS31 bus.

7.4.2 Diagnostic messages of the remote modules to the CS31 bus master

The diagnostic messages which are transferred to the master via the CS31 bus, are available in the system flags.

All the diagnostic messages are entered as FK4 errors (warnings) into the following system flags:

M255_10 / %MX255.10 := TRUE	Sum error message
M255_14 / %MX255.14 := TRUE	FK4 = warning
MW255_08 / %MW1255.8	Error number
MW255_09 / %MW1255.9	Device type
MW255_10 / %MW1255.10	Group number
MW255_11 / %MW1255.11	Channel number

The following table shows the reported messages for the different I/O modules.

Module name	Error number	Device type	Remarks
	%MW1255.8	%MW1255.9	
07 DI 92	-	-	-
07 DC 91	4	4	Overload/short-circuit at an output
07 DC 92	4	4	Overload/short-circuit at an output
07 AI 91	9	1	Cut wire
	10	1	Out of range
07 AC 91	10	1 / 5 *)	Analog input out of range
07 DI 93	4	0	Overload of input supply
07 DO 93	4	2	Overload at an output
07 DK 93	4	4	Overload of input supply or at an output

*) 1 - if only inputs are configured
5 - if inputs and outputs are configured