

C-IPC Expansion VM 052-1 (C-IPC VARAN Manager 052-1)

Versatile Automation Random Access Network

1 x VARAN-Out

With this expansion card, the C-IPC can be expanded by a VARAN Manager with a VARAN-Out interface. This special designed allows easy mounting and fixation.



The cover and mounting accessories are included with delivery of the card!

Le cache et les accessoires de montage sont inclus avec la livraison de la carte!

Technical Data

Performance data

Internal memory	Serial EEPROM (24C02 identification) 16-Mbit SPI-Flash (W25P16)	
Interface connections	1 x VARAN-Out (RJ45) (maximum length: 100 m)	
Status display	Green: Link	Yellow: Active
Connection to periphery device	Over SO-DIMM PCI-Bus Socket	

Electrical requirements

Internal power supply	Typically +5 V DC (supplied over the SO-DIMM socket)	
Current consumption	Minimum 300 mA	Maximum 600 mA

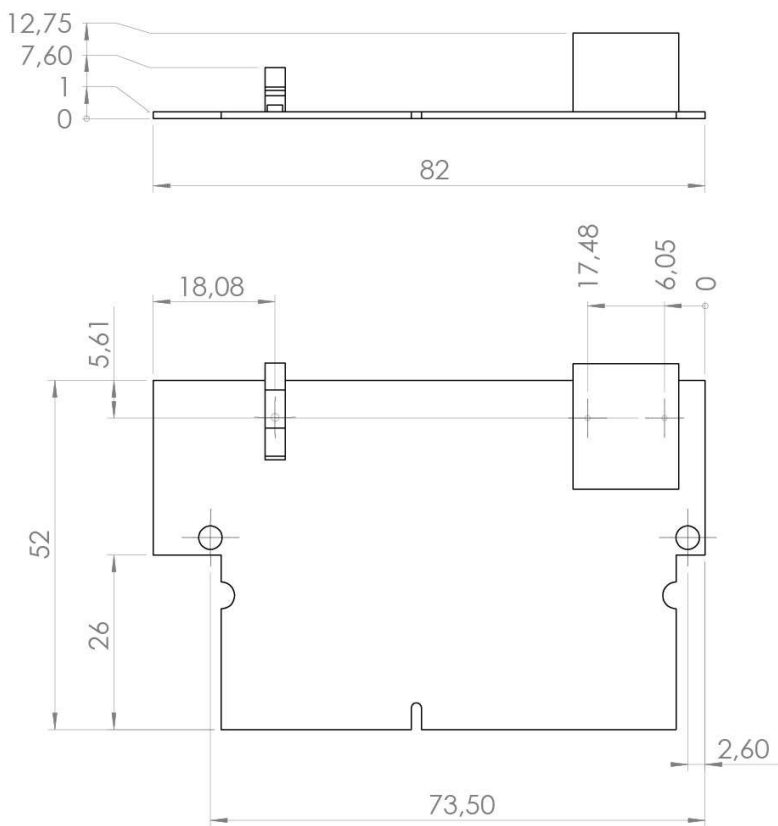
Miscellaneous

Article number	01-460-052-1	
Hardware version	1.x	
Standard	In preparation	

Environmental conditions

Storage temperature	-20 -+85 °C	
Operating temperature	0 -+60 °C	
Humidity	0 - 95 %, non condensing	
EMC stability	According to EN 61000-6-2 (industrial area)	

Mechanical Dimensions

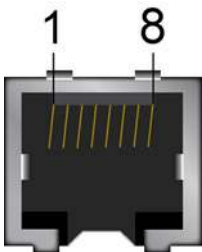


Auxiliary view

Connector Layout



X1: VARAN-Out (8-pin RJ45)



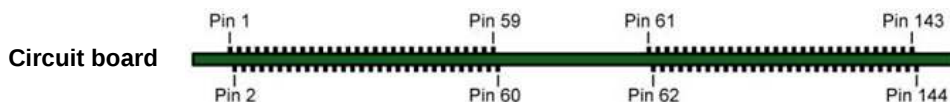
PIN	Function
1	TX/RX+
2	TX/RX-
3	RX/TX+
4	Not used
5	Not used
6	RX/TX-
7	GND
8	GND

More information on the VARAN bus can be found in the VARAN bus specifications!

Fiber optics: 1 x two-color LED

LED	Color	Function
1	Yellow	Active VARAN 1
1	Green	Link VARAN 1

X4: SO-DIMM (144-pin)



Pin	PCI-Bus	Pin	PCI-Bus	Pin	PCI-Bus
1	GND	49	\SERR	97	\INIT / \DIR *
2	GND	50	\PERR	98	\ERR / \HDSSEL *
3	CLK2	51	\TRDY	99	GND
4	CLK3 *	52	\DEVSEL	100	GND
5	GND	53	\STOP	101	PD6 / \MOT0 *
6	GND	54	\RDY	102	PD7 / DRV0 *
7	\REQ1	55	\RESET	103	PD4 / \DSKCHG *
8	\GNT1	56	\FRAME	104	PD5 / RES *
9	\REQ2 *	57	IRQ_W *	105	PD2 / \WP *
10	\GNT2 *	58	IRQ_X	106	PD3 / \RDATA *
11	AD00	59	IRQ_Y *	107	PD0 / \INDEX *
12	AD01	60	IRQ_Z *	108	PD1 / \TRKO *
13	AD02	61	GND	109	GND
14	AD03	62	GND	110	GND
15	AD04	63	GND	111	\AFD / DENSEL *
16	AD05	64	GND	112	GND
17	AD06	65	GND	113	LPT / \FLPY *
18	AD07	66	GND	114	\STB / RES *
19	AD08	67	EWP14	115	Solder pad
20	AD09	68	EWP15	116	I2C_CLK_DVI
21	AD10	69	EWP12	117	Solder pad
22	AD11	70	EWP13	118	I2C_DAT_DVI
23	AD12	71	EWP10	119	GND
24	AD13	72	EWP11	120	GND
25	AD14	73	EWP09	121	GND
26	AD15	74	GND	122	GND
27	AD16	75	EWP07	123	\RESPER_X *
28	AD17	76	EWP08	124	GND
29	AD18	77	EWP05	125	+5V *
30	AD19	78	EWP06	126	+5V *
31	AD20	79	EWP04	127	+5V *
32	AD21	80	GND	128	+5V *
33	AD22	81	EWP02	129	+5V *
34	AD23	82	EWP03	130	+5V *
35	AD24	83	EWP00	131	+5V *
36	AD25	84	EWP01	132	+5V *
37	AD26	85	GND	133	+3V3
38	AD27	86	GND	134	+3V3
39	AD28	87	GND	135	+3V3
40	AD29	88	GND	136	+3V3
41	AD30	89	GND	137	+3V3
42	AD31	90	GND	138	+3V3
43	\CBE0	91	GND	139	+3V3
44	\IDSEL *	92	\SLCT / \WGATE *	140	+3V3
45	\CBE2	93	PE / \WDATA *	141	GND
46	\CBE1	94	\BUSY / MOT1 *	142	GND
47	PAR	95	\ACK / DRV1 *	143	GND
48	\CBE3	96	\SLIN / \STEP *	144	GND

*** THESE SIGNALS ARE NOT IMPLEMENTED ON THE VM 052 (only on the C-IPC).**

*** Ces signaux ne sont pas implémentés sur le VM 052 (uniquement sur le C-IPC).**

Addressing

Addressing for the FPGA and serial FLASH, see VARAN bus specifications. The I²C EEPROM serves as the module identification.

Address (thex)	Size (bytes)	Device ID (thex)	Description
00000			PCI Bar1 for VM program memory
Specific Address Space			
03010	2	0E30	Reset Logic

Reset signals VM 052

Signal name	Signal	Description
pci_reset	in	PCI reset signal
wd_reset	intern in	Timer / counter watchdog reset
cli_reset	intern in	OS CLI reset from PLL
clk_lost_0	intern in	Clock signal lost
reset_power_on	intern out	Power on reset intern
reset	intern out	FPGA intern reset signal
phy_reset_n_1	out	Phy1 reset (min. 100 us)
phy_reset_n_2	out	Phy2 reset (min. 100 us)
phy_reset_n_3	out	Phy3 reset (min. 100 us)

Installing and Removing the Expansion Print

When installing the expansion print, the following process must be followed:

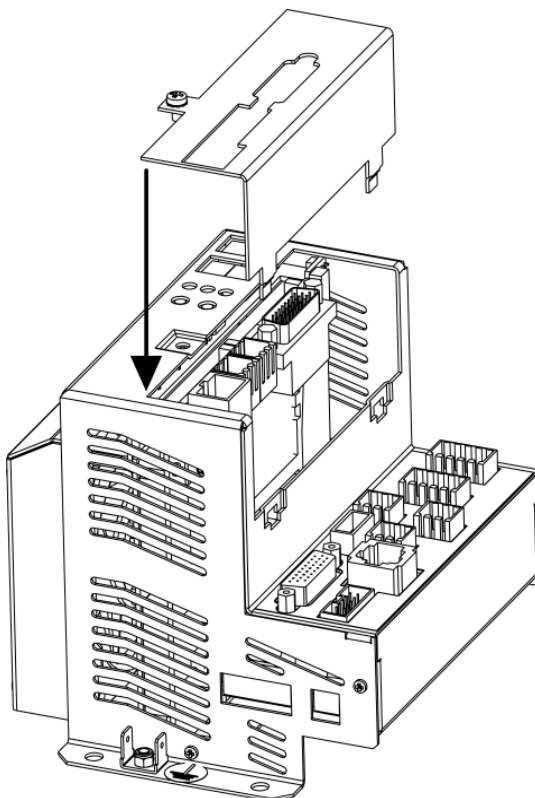
- The card is first inserted in the SO_DIMM socket on an angle.
- Next, the card must be pressed into the holder.
- Finally, it is then secured to the C-IPC with the M2x4 bolts!

The removal is completed in reverse:

- The card is first unscrewed from the C-IPC.
- Next, the card must be tilted forward in order to be released from the holders.
- Finally, the card is removed from the SO-DIMM socket!

Mounting the Housing Cover

The housing cover is placed vertically on the C-IPC, the prongs inserted in the openings provided and then screwed down.



Recommended Shielding for VARAN

The real-time VARAN Ethernet bus system exhibits very robust characteristics in industrial environments. By using the standard IEEE 802.3 Ethernet physics, the potential between an Ethernet line and the sending/receiving components is separated. Messages to a bus participant are immediately repeated by the VARAN Manager in the event of an error. The shielding described below is principally recommended.

For applications in which the bus line must be laid outside of the control cabinet, the correct shielding must be provided. Especially when, for structural reasons, the bus line must be placed next to strong electromagnetic interference. It is recommended to avoid placing Varan bus lines parallel to power cables whenever possible.

SIGMATEK recommends the use of CAT5e industrial Ethernet bus cables.

For the shielding, an S-FTP cable should be used.

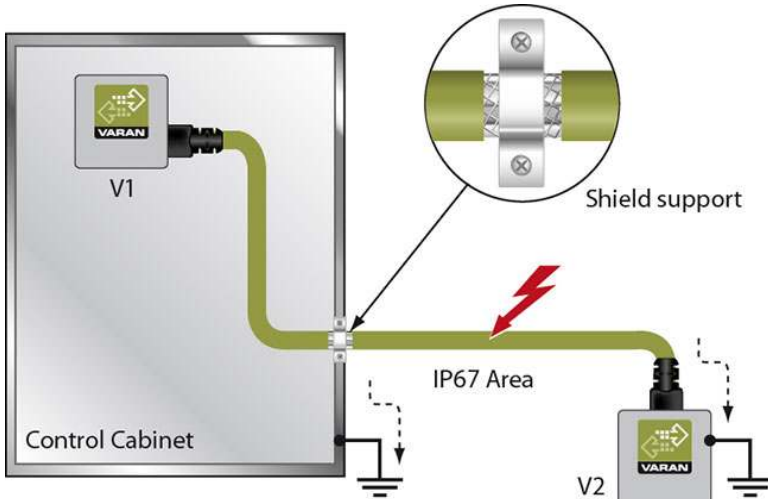
An S-FTP bus is a symmetric, multi-wire cable with unshielded pairs. For the total shielding, a combination of foil and braiding is used. A non-laminated variant is recommended.

The VARAN cable must be secured at a distance of 20 cm from the connector for protection against vibration!

Le câble VARAN doit être protégé contre les vibrations à moins de 20 cm du connecteur (par exemple à l'aide d'une pince)!

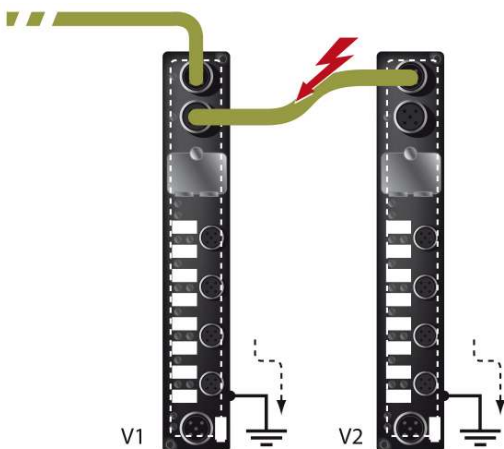
1. Wiring from the Control Cabinet to an External VARAN Component

If the Ethernet line is placed from a VARAN component to a VARAN node outside of the control cabinet, it is recommended that the shielding be placed at the entrance of the control cabinet housing. All noise can then be dissipated before reaching the electronic components.



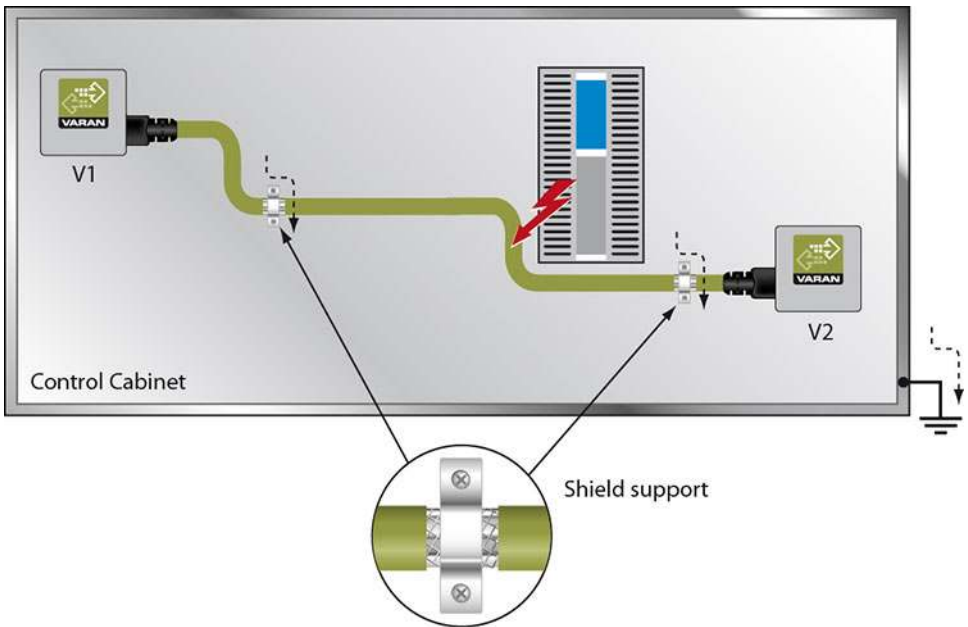
2. Wiring Outside of the Control Cabinet

If a VARAN bus cable must be placed outside of the control cabinet only, no additional shield connection is required. This requires that only IP67 modules and connectors be used. These components are very robust and noise resistant. The shielding for all sockets in IP67 modules are internally connected to common bus or electrically connected to the housing, whereby the deflection of voltage spikes does not flow through the electronics.



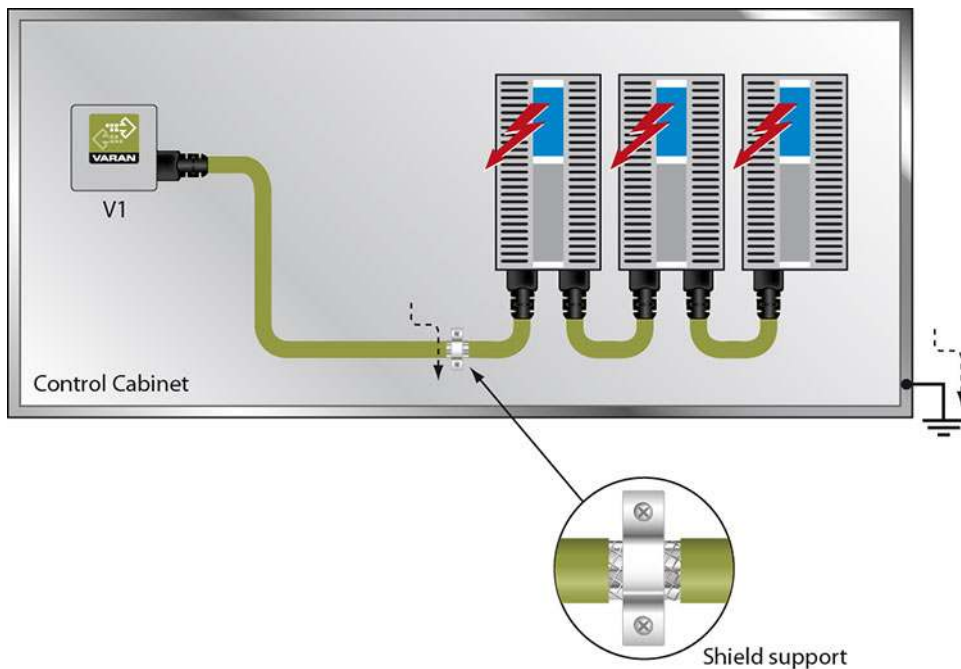
3. Shielding for Wiring Within the Control Cabinet

Sources of strong electromagnetic noise located within the control cabinet (drives, Transformers, etc.) can induce interference in a VARAN bus line. Voltage spikes are dissipated over the metallic housing of a RJ45 connector. Noise is conducted over the control cabinet without additional measures needed on the circuit board of electronic components. To avoid error sources with data exchange, it is recommended that shielding be placed before any electronic components in the control cabinet.



4. Connecting Noise-Generating Components

With the connection of power components that generate strong electromagnetic interference, it is also critical to ensure correct shielding. The shielding should be placed before a power element (or group of power elements).



5. Shielding Between Two Control Cabinets

If two control cabinets must be connected with a VARAN bus line, it is recommended that the shielding be placed at the entry points of both control cabinets. Noise is therefore prevented from reaching the electronic components in both cabinets.

