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CVI Controllers - **Profinet IO** - Manual



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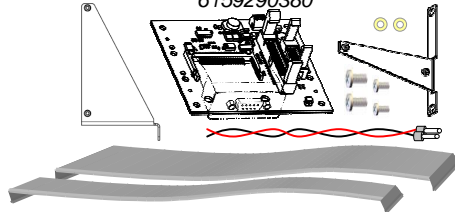
1. CVI Controllers - Profinet IO

1.1. CVI - Profinet IO - Installation

Profinet I/O Module
6159275960

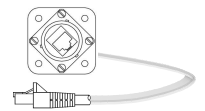


Fieldbus Module Adaption Board Kit
6159290380



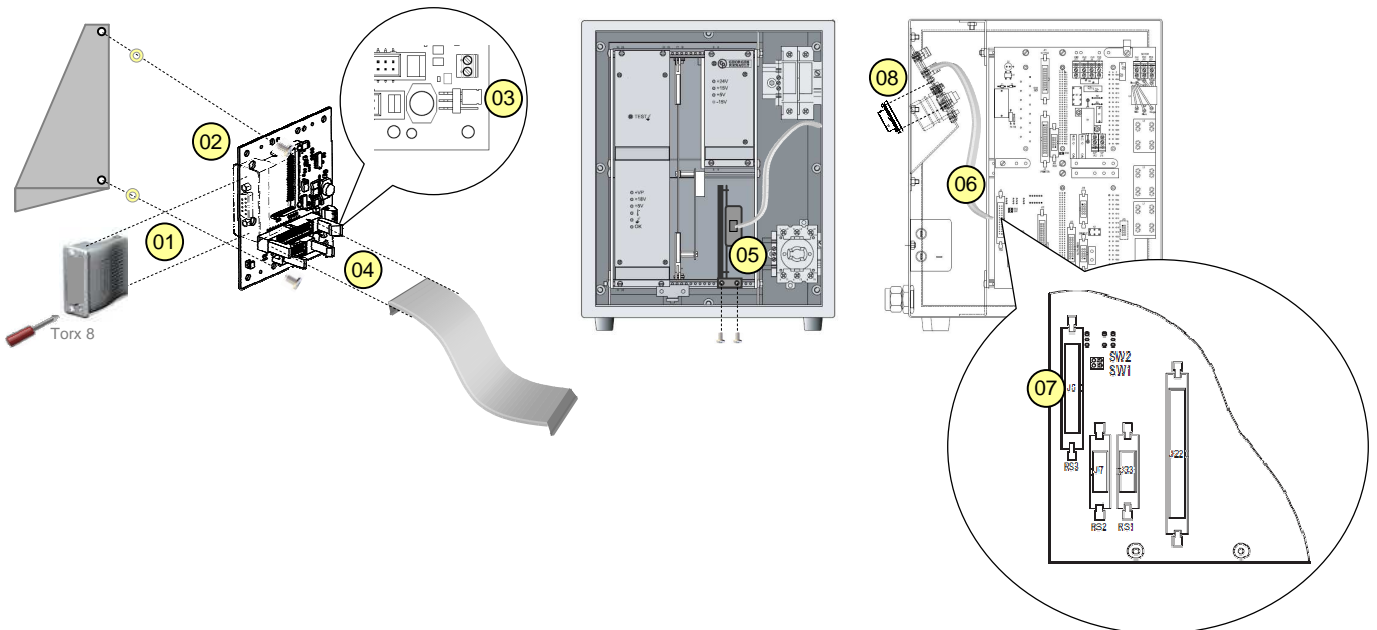
CVI Firmware version >= 6.x

Ext. Cable for CVI II & TWINCVI
6159174090



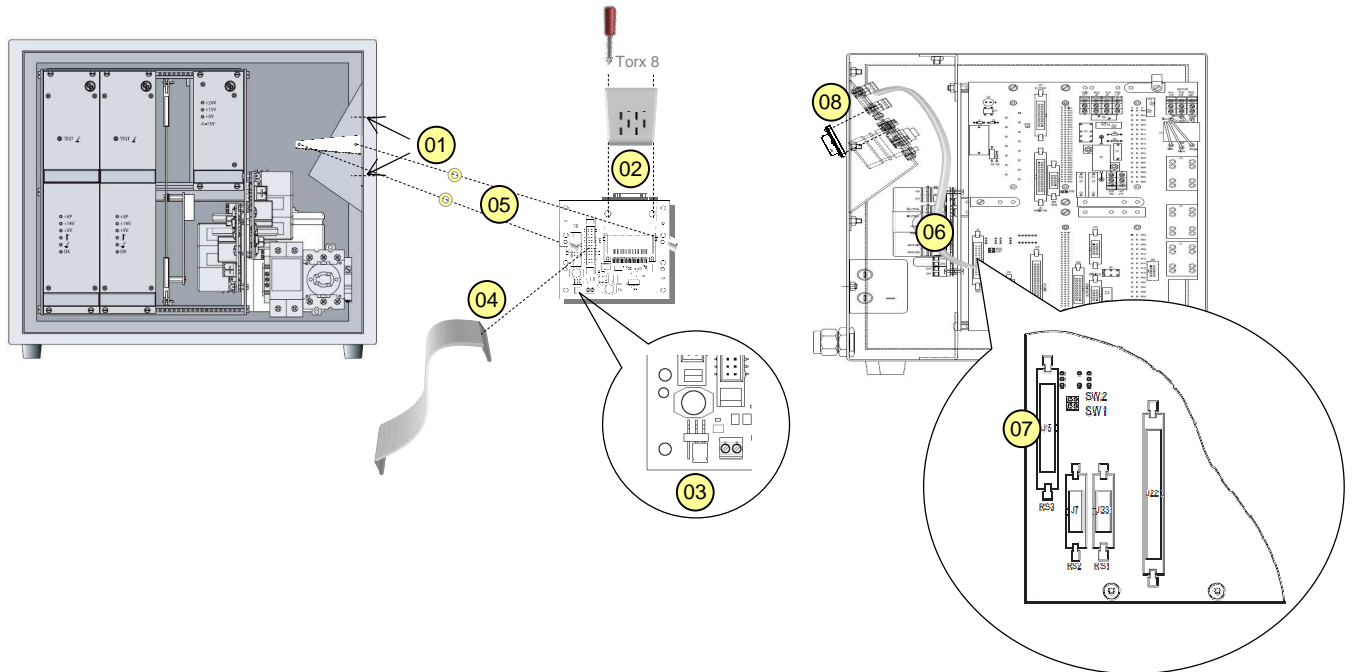
1.1.1. Hardware installation Procedure

1.1.1.1. CVI II & TWINCVI II Standard



- 01 – Install and fasten the Fieldbus Module on the Adaption board.
- 02 – Fasten the Adaption Board with the triangular bracket.
- 03 – Verify the Adaption Board power supply jumper is in correct position (1-2).
- 04 – Install the 26 points large flat cable on the Adaption board.
- 05 – Install and fasten the Adaption Board with it bracket and cable in the CVI.
- 06 – Disconnect the existing large flat cable plugged on CVI RS3 (J5) connector (from RSB connector).
- 07 – Plug the 26 points large flat cable from Adaption Board on the CVI RS3 (J5) connector.
- 08 – Install the extension cable for CVI II & TWINCVI on the controller side panel and plug the RJ45 connector in the fieldbus module.

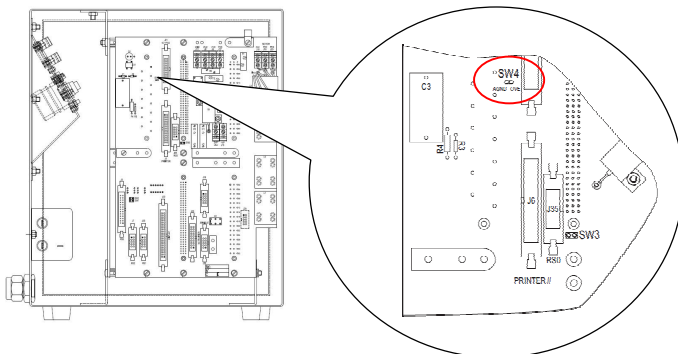
1.1.1.2. TWINCVI II - US



- 01 – Untighten the two nuts in the TWINCVI front right side and fasten the Fieldbus Module “T” bracket.
- 02 – Install and fasten the Fieldbus Module on the Adaption board.
- 03 – Verify the Adaption Board power supply Jumper is in correct position (1-2).
- 04 – Install the 26 points large flat cable on the Adaption board.
- 05 – Install and fasten the Adaption Board on it “T” bracket in the CVI.
- 06 – Disconnect the existing large flat cable plugged on CVI RS3 (J5) connector (from RSB connector).
- 07 – Plug the 26 points large flat cable from Adaption Board on the CVI RS3 (J5) connector.
- 08 – Install the extension cable for CVI II & TWINCVI on the controller side panel and plug the RJ45 connector in the fieldbus module.

1.1.1.3. Fieldbus Module and controller Grounds link

To prevent communication parasites risks between controller and Fieldbus module, it is possible to link the AGND (CVI Ground) to the 0VE (Module isolated Ground) by soldering the SW4 switch.




1.1.2. CVI controller parameters

Verify that the CVI controller firmware version is 6.x minimum.

1.1.2.1. Adaptation board communication parameters

From CVI control screen:

- Press Esc.
- Select Parameters.
- Select Peripherals.
- Select Serial Ports.
- Press Page Down. 
- On **RSB** serial port parameters, select:
 - o **AB C-COM**
 - o RS232
 - o 115200
 - o 8 data bit
 - o 1 stop bit
 - o None parity
- Press F10.

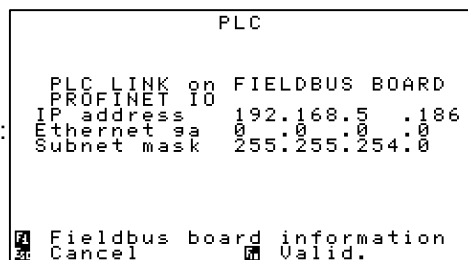


The CVI controller automatically reboots.

1.1.2.2. PLC parameters

From CVI control screen:

- Press Esc.
- Select Parameters.
- Select Peripherals.
- Select PLC.
- On PLC LINK on FIELDBUS BOARD, enter:
 - o Module IP address
 - o Ethernet gateway
 - o Subnet Mask
- Press F10.

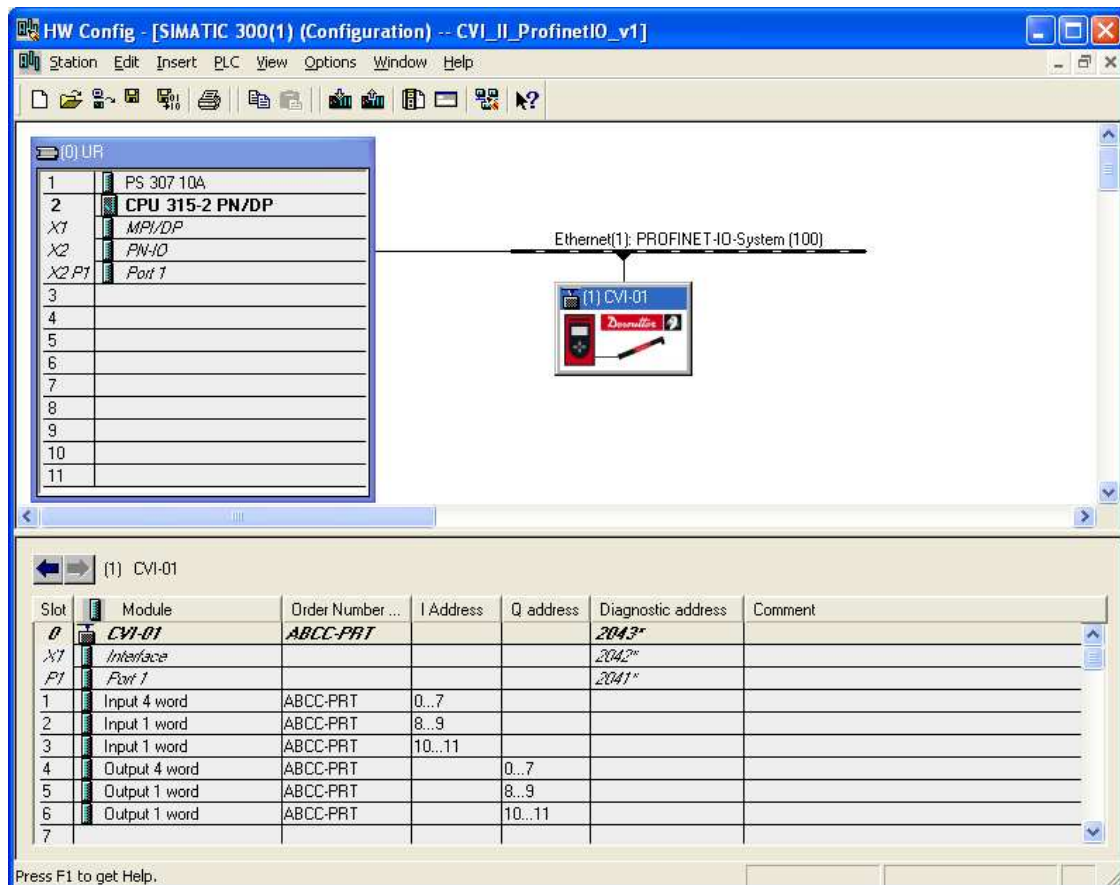


1.2. CVI - Profinet IO - Integration in Simatic Manager HW Config

Install the GSD file: “GSDML-V2.2-DESOUTTER-PRT-20100408.xml “ from your Step 7 - HW configuration.

From Hardware Catalog / Profinet IO / Additional Field Devices / General:

- Select the CVIx PRT / RT Device and drag drop it on your Profinet network.
(Select the CVIx PRT / Migration / RT Device if your PLC doesn't support extended PROFINET diagnostics.)
- Configure the Module with 6 slots defined as below:
 - Slot 1 = Input 4 word.
 - Slot 2 = Input 1 word.
 - Slot 3 = Input 1 word.
 - Slot 4 = Output 4 word.
 - Slot 5 = Output 1 word.
 - Slot 6 = Output 1 word.



Slot	Module	Order Number ...	I Address	Q address	Diagnostic address	Comment
0	CVI-01	ABCC-PRT			2043*	
X1	Interface				2042*	
P1	Port 1				2041*	
1	Input 4 word	ABCC-PRT	0...7			
2	Input 1 word	ABCC-PRT	8...9			
3	Input 1 word	ABCC-PRT	10...11			
4	Output 4 word	ABCC-PRT		0...7		
5	Output 1 word	ABCC-PRT		8...9		
6	Output 1 word	ABCC-PRT		10...11		
7						

N.B: The “Device Name” defined in Simatic Manager HW Config must be identical to the “Station Comment” defined in CVI Station parameters.



1.3. CVI - Profinet IO - Memory Mapping

CVI Memory Address				Data Description	Access (R/W)	Size (bytes)	Value Type
In Bytes		In Words					
Hexa.	Deci.	Hexa.	Deci.				
Slot 1 - Input 4 Word CVI Controller - 24v Inputs & Outputs							
0x0100	256	0x0080	128	24v CVI Outputs – Channel 1	R	2	BOOL
0x0102	258	0x0081	129	24v CVI Outputs – Channel 2	R	2	BOOL
0x0104	260	0x0082	130	24v CVI Inputs – Channel 1	R	2	BOOL
0x0106	262	0x0083	131	24v CVI Inputs – Channel 2	R	2	BOOL
Slot 2 - Input 1 Word CVI Controller - Station 1 - Cycle Echo							
0x102E	4142	0x0817	2071	Selected Cycle (Cycle Echo)	R	2	INT
Slot 3 - Input 1 Word CVI Controller - Station 2 - Cycle Echo (TWINCVI & MODCVI asynchronous)							
0x202E	8238	0x1017	4119	Selected Cycle (Cycle Echo)	R	2	INT
Slot 4 - Output 4 Word CVI Controller - Fieldbus Inputs & 24v Inputs Mask							
0x0108	264	0x0084	132	Fieldbus CVI Inputs – Channel 1	W	2	BOOL
0x010A	266	0x0085	133	Fieldbus CVI Inputs – Channel 2	W	2	BOOL
0x010C	268	0x0086	134	24v CVI Inputs Mask – Channel 1	W	2	BOOL
0x010E	270	0x0087	135	24v CVI Inputs Mask – Channel 2	W	2	BOOL
Slot 5 - Output 1 Word CVI Controller – Station 1 - Cycle Selection							
0x0200	512	0x0100	256	Cycle Number Selection	W	2	INT
Slot 6 - Output 1 Word CVI Controller – Station 2 - Cycle Selection (TWINCVI & MODCVI asynchronous)							
0x0400	1024	0x0200	512	Cycle Number Selection	W	2	INT



1.3.1. CVI - 24v Inputs & Outputs

1.3.1.1. CVI Inputs Descriptions

- Cycle 1/2/4/8/16:** Binary coded 1-2-4-8-16 cycle selection.
The Cycle number selection 00 to 31 is only taken into consideration by the CVI if the "Source of cycle number" is set to "I/O" in the controller station parameters.
- Start Cycle:** The tool runs as long as the signal is on "1". When the signal drops, the cycle stops.
- Direction:** Activates the untightening direction mode of the spindle at the "Start cycle".
- Report Request:** Upon request of the PLC, the controller sends the latest result and tightening report on serial Link (Report output functionality).
When the Report Acknowledgement option is activated in the station parameters, the spindle will not start until the "Report Request" input is activated (pulse).
- Emergency Stop:** Active when signal is off "0". Emergency stop shuts down the controller servo drive power.
- Reset:** Reset station tightening reports, all cycles' counters, saved barcode.
- Error Acknowledge:** When the error acknowledgement option is activated in the station parameters, the start of the spindle is not authorized after a reject report. The "error acknowledgement" input must be validated (pulse) to let the spindle start again.
By activating the error acknowledge input, the reject report output is reseted.
- Spindle Validation:** Allows, or not, the start cycle of the spindle(s).
The spindle validation input is only taken into consideration by the CVI if the spindle validation source is set to I/O in the station parameters.
Untightening validation is only controlled when "Spindle validation on reverse" option is activated in the station parameters.
- Synchro IN:** Used in conjunction with Synchro OUT output to synchronise the tightening cycle phases of several controllers (synchro waiting phase).
- External Stop:** When the external stop option is set in a cycle rundown speed, final speed or run reverse phase, the controller will stops the current phase and shifts to the next one as soon as the signal shifts to "1".



1.3.1.2. CVI Outputs Descriptions

Cycle Echo 1/2/4/8/16: Binary coded 1-2-4-8-16 selected cycle echo. The cycle echo is sent back only if it corresponds to a programmed cycle in the station. Otherwise it is at "0".

Accept Report: Active when the cycle is over and the tightening cycle report is OK.

Reject Report: Active when the cycle is over and the tightening cycle report is NOK.

Number of cycles OK: This signal switches to "1" when the number of cycles run with an Accept Report is equal to the programmed number of cycles OK in the selected cycle parameters.

In Cycle: Response to the Start Cycle request. Drops to "0" at the end of a tightening or untightening.

Ready: This signal is at "1" when the controller is in working order.

Run reverse detected: A real untightening has been detected during continuous untightening operation (torque and angle went beyond the programmed thresholds defined in station run reverse parameters).

Synchro OUT: Used in conjunction with Synchro IN input to synchronise the tightening cycle phases of several controllers (synchro waiting phase).

For detailed information, please read the CVI controller manual.

1.3.1.3. 24v CVI Outputs – Channel 1

24v CVI Outputs - Channel 1						
	Bit Nb	Description	TWINCVI / MODCVI Asynchronous	TWINCVI / MODCVI Synchronous	CVI II (Synchronous)	CPU MULTICVI (Synchronous)
LSB	00	Cycle Echo 01	✓	✓	✓	✓
	01	Cycle Echo 02	✓	✓	✓	✓
	02	Cycle Echo 04	✓	✓	✓	✓
	03	Cycle Echo 08	✓	✓	✓	✓
	04	Cycle Echo 16	✓	✓	✓	✓
	05	Accept Report	✓	✓	✓	✓
	06	Reject Report	✓	✓	✓	✓
	07	Number of Cycles OK	✓	✓	✓	✓
MSB	08	In Cycle	✓	✓	✓	✓
	09	Ready	✓	✓	✓	✓
	10	---	✓	✓	✓	✓
	11	---	✓	✓	✓	✓
	12	Run Reverse Detected	✓	-	✓	-
	13	---	✓	✓	✓	✓
	14	Synchro out	✓	✓	✓	✓
	15	---	✓	✓	✓	✓

1.3.1.4. 24v CVI Outputs – Channel 2

24v CVI Outputs - Channel 2						
	Bit Nb	Description	TWINCVI / MODCVI Asynchronous	TWINCVI / MODCVI Synchronous	CVI II (Synchronous)	CPU MULTICVI (Synchronous)
LSB	00	Accept Spindle 01	*	✓	✓	-
	01	Accept Spindle 02	*	✓	-	-
	02	Reject Spindle 01	*	✓	✓	-
	03	Reject Spindle 02	*	✓	-	-
	04	---	*	✓	✓	✓
	05	---	*	✓	✓	✓
	06	---	*	✓	✓	✓
	07	---	*	✓	✓	✓
MSB	08	---	*	✓	✓	✓
	09	---	*	✓	✓	✓
	10	---	*	✓	✓	✓
	11	---	*	✓	✓	✓
	12	---	*	✓	✓	✓
	13	---	*	✓	✓	✓
	14	---	*	✓	✓	✓
	15	---	*	✓	✓	✓

*: for asynchronous TWINCVI & MODCVI, the 24v CVI outputs definitions on channel 2 are identical to channel 1.

1.3.1.5. 24v CVI Inputs – Channel 1

24v CVI Inputs - Channel 1						
	Bit Nb	Description	TWINCVI / MODCVI Asynchronous	TWINCVI / MODCVI Synchronous	CVI II (Synchronous)	CPU MULTICVI (Synchronous)
LSB	00	Cycle 01	✓	✓	✓	✓
	01	Cycle 02	✓	✓	✓	✓
	02	Cycle 04	✓	✓	✓	✓
	03	Cycle 08	✓	✓	✓	✓
	04	Cycle 16	✓	✓	✓	✓
	05	Start Cycle	✓	✓	✓	✓
	06	Direction	✓	✓	✓	✓
	07	Report Request (or Ack.)	✓	✓	✓	✓
MSB	08	Emergency Stop	✓	✓	✓	✓
	09	Reset	✓	✓	✓	✓
	10	Error Acknowledgement	✓	✓	✓	✓
	11	Spindle Validation	✓	✓	✓	-
	12	Synchro In	✓	✓	✓	✓
	13	Spindle External Stop	✓	✓	✓	-
	14					
	15					

1.3.1.6. 24v CVI Inputs – Channel 2

24v CVI Inputs - Channel 2						
	Bit Nb	Description	TWINCVI / MODCVI Asynchronous	TWINCVI / MODCVI Synchronous	CVI II (Synchronous)	CPU MULTICVI (Synchronous)
LSB	00	---	*	✓	✓	✓
	01	---	*	✓	✓	✓
	02	---	*	✓	✓	✓
	03	---	*	✓	✓	✓
	04	---	*	✓	✓	✓
	05	---	*	✓	✓	✓
	06	---	*	✓	✓	✓
	07	---	*	✓	✓	✓
MSB	08	---	*	✓	✓	✓
	09	---	*	✓	✓	✓
	10	---	*	✓	✓	✓
	11	Spindle Validation	✓	✓	-	-
	12	---	*	✓	✓	✓
	13	Spindle External Stop	✓	✓	-	-
	14					
	15					

*: for asynchronous TWINCVI & MODCVI, the 24v CVI inputs definition on channel 2 are identical to channel 1.

1.3.2. CVI - Selected Cycle (Cycle Echo)

This word indicates the number of the selected cycle in the CVI station.
The selected cycle echo range is between 0 & 250 (0 = no cycle selected).

1.3.3. CVI - Fieldbus Inputs & 24v Inputs Mask

The same inputs functions executed by the 24V CVI inputs can be used with fieldbus.
However, not all of the inputs functions are available depending on type of fieldbus.

1.3.3.1. Fieldbus CVI Inputs - Channel 1

Fieldbus CVI Inputs - Channel 1						
	Bit Nb	Description	TWINCVI / MODCVI Asynchronous	TWINCVI / MODCVI Synchronous	CVI II (Synchronous)	CPU MULTICVI (Synchronous)
LSB	00	Cycle 01	✓	✓	✓	✓
	01	Cycle 02	✓	✓	✓	✓
	02	Cycle 04	✓	✓	✓	✓
	03	Cycle 08	✓	✓	✓	✓
	04	Cycle 16	✓	✓	✓	✓
	05	Start Cycle	✓	✓	✓	✓
	06	Direction	✓	✓	✓	✓
MSB	07	Report Request (or Ack.)	✓	✓	✓	✓
	08	Emergency Stop	✓	✓	✓	✓
	09	Reset	✓	✓	✓	✓
	10	Error Acknowledgement	✓	✓	✓	✓
	11	Spindle Validation	✓	✓	✓	-
	12	Synchro In	✓	✓	✓	✓
	13	Spindle External Stop	✓	✓	✓	-
	14					
	15					

1.3.3.2. Fieldbus CVI Inputs - Channel 2

Fieldbus CVI Inputs - Channel 2						
	Bit Nb	Description	TWINCVI / MODCVI Asynchronous	TWINCVI / MODCVI Synchronous	CVI II (Synchronous)	CPU MULTICVI (Synchronous)
LSB	00	---	*	✓	✓	✓
	01	---	*	✓	✓	✓
	02	---	*	✓	✓	✓
	03	---	*	✓	✓	✓
	04	---	*	✓	✓	✓
	05	---	*	✓	✓	✓
	06	---	*	✓	✓	✓
MSB	07	---	*	✓	✓	✓
	08	---	*	✓	✓	✓
	09	---	*	✓	✓	✓
	10	---	*	✓	✓	✓
	11	Spindle Validation	✓	✓	-	-
	12	---	*	✓	✓	✓
	13	Spindle External Stop	✓	✓	-	-
	14					
	15					

*: for asynchronous TWINCVI & MODCVI, the 24v CVI inputs definition on channel 2 are identical to channel 1.



1.3.3.3. 24v CVI Inputs Mask - Channel 1 & 2

When a CVI input can be accessed by the fieldbus and a 24 V input, an “OR” function is executed by default between the fieldbus input and the 24 V input.

Masks are used to disable the functions of 24v CVI inputs.

Example: To control the “Cycle start” only over the fieldbus and disable this function by the 24V input, the bit n°5 of the CVI 24v input mask must be set to 1.
Value to write in 24v CVI Inputs Mask = $0x0020$ (hexa) = 32 (deci) = 00100000 (bin).

1.3.4. CVI - Cycle Selection

The Cycle number selection is only taken into consideration by the CVI if the “Source of cycle number” is set to “PLC” in the controller station parameters.

The cycle number selection range is between 1 & 250 (0 = no cycle selection).

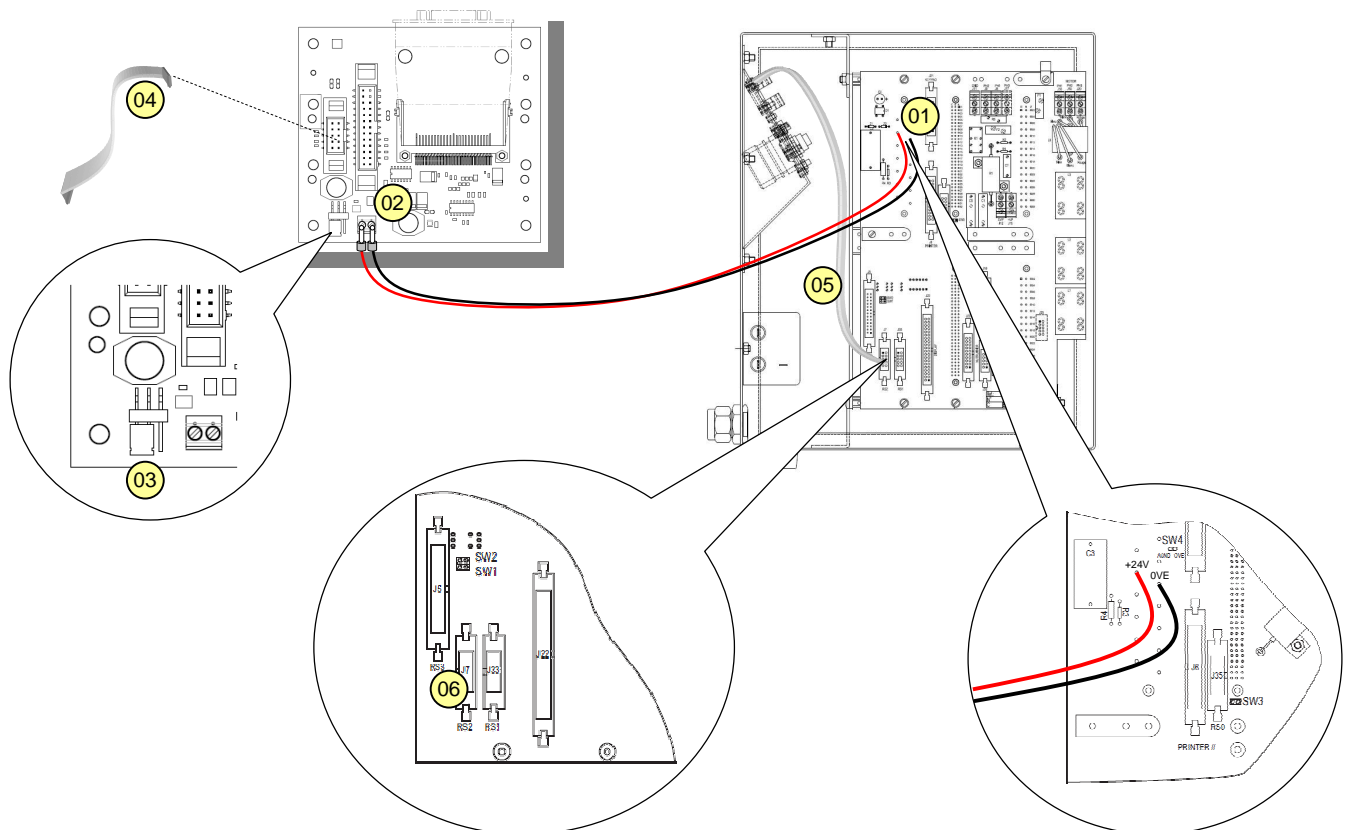
2. Appendix

2.1. Alternative Fieldbus Module connection via RSPC

Be careful, by choosing RSPC for communication with fieldbus module, it is no more possible to use RSPC serial port for CVIPC 2000 PC Transfer. You will have to use Ethernet Socket 1.

2.1.1. Hardware installation Procedure

The procedure is the identical as described above. But large 26 points flat cable is replaced with thin 10 points flat cable, power supply is taken from CVI back panel by soldering 2 wires and the jumper configuration on adaptation board has to be changed.



- 01 – Solder the 2 red and black wires on CVI back panel power supply (24v & 0VE).
- 02 – Tighten the 2 red and black wires on the Adaption Board power supply connector.
- 03 – Change the Adaption Board power supply Jumper to position (2-3).
- 04 – Install the thin 10pts flat cable on the Adaption board.
- 05 – Disconnect the existing flat cable plugged on CVI RS2 (J7) connector (from RSPC connector).
- 06 – Plug the thin 10pts flat cable from Adaption Board on the CVI RS2 (J7) connector.

2.1.2. CVI controller parameters

Verify that the CVI controller firmware version is 6.x minimum.

2.1.2.1. Adaptation board communication parameters

From CVI control screen:

- Press Esc.
- Select Parameters.
- Select Peripherals.
- Select Serial Ports.
- On **RSPC** serial port parameters, select:
 - o **AB C-COM**
 - o RS232
 - o 115200
 - o 8 data bit
 - o 1 stop bit
 - o None parity
- Press F10.

```
SERIAL PORTS
RSPC
+ AB C-COM
+ RS232
+ 115200
+ 8 data bits
+ 1 stop bit
+ none
Slave number : 0
[ F10 ] Valid. [ F10 ] Selection
```

The CVI controller automatically reboots.

2.1.2.2. PLC parameters

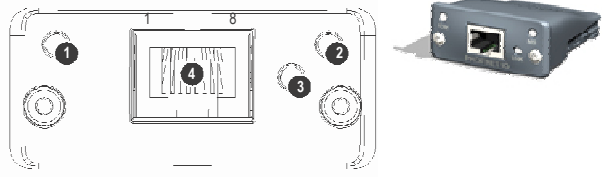
From CVI control screen:

- Press Esc.
- Select Parameters.
- Select Peripherals.
- Select PLC.
- On PLC LINK on FIELDBUS BOARD, enter:
 - o Module IP address
 - o Ethernet gateway
 - o Subnet Mask
- Press F10.

```
PLC
PLC LINK on FIELDBUS BOARD
PROFINET IO
IP address 192.168.5 .186
Ethernet aa 0 : 0 : 0 : 0
Subnet mask 255.255.254.0
[ F10 ] Fieldbus board information
[ F10 ] Cancel [ F10 ] Valid.
```


2.2. Modules Details

2.2.1. Profinet IO Module

#	Item	
1	Network Status LED	
2	Module Status LED	
3	Link/Activity LED	
4	Ethernet Interface	

Network Status LED

Note: A test sequence is performed on this LED during startup.

LED State	Description	Comments
Off	Offline	- No power - No connection with PLC
Green	Online (RUN)	- Connection with PLC established - PLC in RUN state
Green, flashing	Online (STOP)	- Connection with PLC established - PLC in STOP state

Module Status LED

Note: A test sequence is performed on this LED during startup.

LED State	Description	Comments
Off	Not Initialized	No power - or - Module in 'SETUP' or 'INIT' state
Green	Normal Operation	Module has shifted from the 'INIT' state
Green, 1 flash	Diagnostic Event(s)	Diagnostic event(s) present
Green, 2 flashes	Blink	Used by engineering tools to identify the node on the network
Red	Exception Error	Module in state 'EXCEPTION'
Red, 1 flash	Configuration Error	Expected Identification differs from Real Identification
Red, 2 flashes	IP Address Error	IP address not set
Red, 3 flashes	Station Name Error	Station Name not set
Red, 4 flashes	Internal Error	Module has encountered a major internal error

LINK/Activity LED

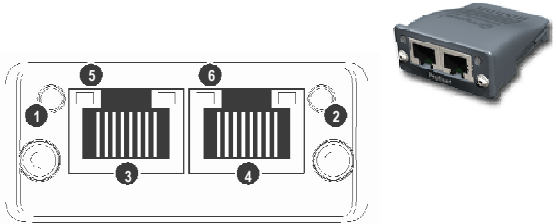
LED State	Description	Comments
Off	No Link	No link, no communication present
Green	Link	Ethernet link established, no communication present
Green, flickering	Activity	Ethernet link established, communication present

Ethernet Interface

The ethernet interface operates at 100Mbit, full duplex, with auto-negotiation enabled as default.

2.2.2. Profinet IO 2 ports Module

#	Item
1	Network Status LED
2	Module Status LED
3	Ethernet (port 1)
4	Ethernet (port 2)
5	Link/Activity LED (port 1)
6	Link/Activity LED (port 2)



Network Status LED

Note: A test sequence is performed on this LED during startup.

LED State	Description	Comments
Off	Offline	- No power - No connection with PLC
Green	Online (RUN)	- Connection with PLC established - PLC in RUN state
Green, flashing	Online (STOP)	- Connection with PLC established - PLC in STOP state

Module Status LED

Note: A test sequence is performed on this LED during startup.

LED State	Description	Comments
Off	Not Initialized	No power - or - Module in 'SETUP' or 'INIT' state
Green	Normal Operation	Module has shifted from the 'INIT' state
Green, 1 flash	Diagnostic Event(s)	Diagnostic event(s) present
Green, 2 flashes	Blink	Used by engineering tools to identify the node on the network
Red	Exception Error	Module in state 'EXCEPTION'
Red, 1 flash	Configuration Error	Expected Identification differs from Real Identification
Red, 2 flashes	IP Address Error	IP address not set
Red, 3 flashes	Station Name Error	Station Name not set
Red, 4 flashes	Internal Error	Module has encountered a major internal error

LINK/Activity LED

LED State	Description	Comments
Off	No Link	No link, no communication present
Green	Link	Ethernet link established, no communication present
Green, flickering	Activity	Ethernet link established, communication present

Ethernet Interface

The ethernet interface operates at 100Mbit, full duplex, as required by PROFINET.