

FIELDBUS

User manual

Module	Part number
CC-Link	6159275980
DeviceNet	6159275990
EtherNet IP	6159275940
Modbus TCP	6159276150
Profibus	6159275950
ProfiNet (1 port)	6159275960
ProfiNet (2 ports)	6159275970
ProfiNet IRT (2 ports)	6159270700

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Original instructions

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1 - OVERVIEW

1.1 - Read before starting

- Before starting using CVI CONFIG, check that Desoutter hardware and software have been installed, tested and validated as described in the manuals available at <https://www.desouttertools.com/resource-centre>.

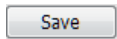
1.2 - Description

The purpose of Fieldbus is to share reliable data between the system and the PLC. Generally, the PLC is the master and the systems are slaves (i.e. the PLC is in charge of writing or reading data in the system memory when needed).

To communicate on Fieldbus, the system has to be equipped with a dedicated Fieldbus module. To establish the communication, the system and the PLC must agree about the data they exchange. The user must define exactly the same settings on both sides. Use CVI MONITOR to check that your programming is correct.

2 - CONFIGURATION

- In this section, modifications are not being automatically saved.



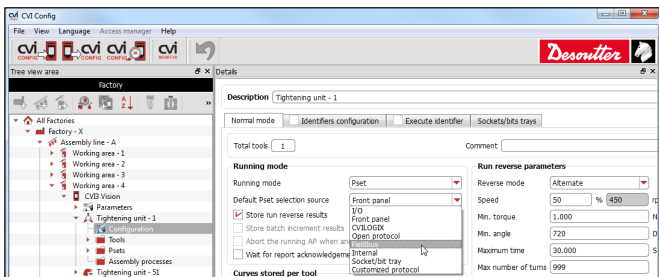
- Save the configurations by pressing this icon.



- Refer to "Appendix - Fieldbus" to get more information about the variables and the modules description.

2.1 - Setting Fieldbus as the process source

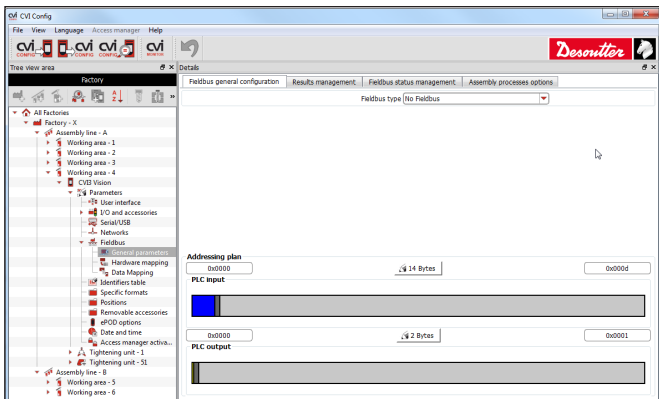
- Go to the tree view and select the product.
- Select the tightening unit which drives the tool.



- In the box "Running mode", select Pset or Assembly Process.
- In the box "Default Pset selection source", select "Fieldbus".

2.2 - Programming

- Go to the tree view and select the product.
- Click "Parameters / Fieldbus".



- Select the type of Fieldbus according to the module installed in the system.
- Configure then the communication parameters between the PLC and the system.



- For further information, contact your Desoutter representative for support.

Endianness

By default, the system expresses all binary values in Big-Endian endianness. For example, the representation in the memory of the 32 bits value 0x11223344 is:

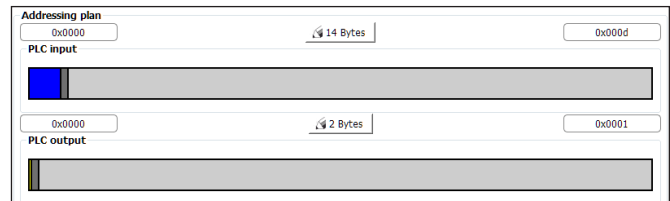
Address	0	1	2	3
Value	0x11	0x22	0x33	0x44

The PLC can have different representation of binary values in its memory. To allow the system to cope with this different configuration, the user can choose different formats of binary representation (examples for value 0x11223344).

Setting	Address			
	0	1	2	3
No-used (ABCD ABCD)	0x11	0x22	0x33	0x44
Swap reverse only (ABCD DCBA)	0x44	0x33	0x22	0x11
Swap word only (ABCD BADC)	0x22	0x11	0x44	0x33
Swap reverse / word (ABCD CDAB)	0x33	0x44	0x11	0x22

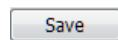
Addressing plan

- Set the size of data exchanged between PLC and the system.



In this example:

- 14 bytes of data (from address 0x0 to address 0xD included) are defined for data coming from the system to PLC.
- 2 bytes of data (from address 0x0 to address 0x1 included) are defined for data coming from PLC to the system.

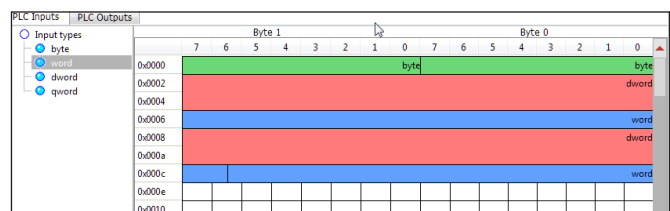


- Save the configuration by pressing this icon.

2.2.1 - Hardware mapping

- This part will help you to organize read and write zones (n items of bytes / words / dwords / qwords)

PLC inputs

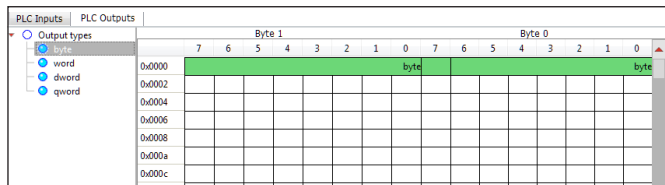


- Drag and drop the items from the left to the right.

In this example, the PLC can read (PLC inputs) 14 bytes organized as follows:

A byte	8 bits	at address 0
A byte	8 bits	at address 1
A double word	32 bits	at address 2
A word	16 bits	at address 6
A double word	32 bits	at address 8
A word	16 bits	at address 12

PLC outputs



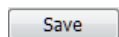
- Drag and drop the items from the left to the right.

In this mapping, the PLC can write (PLC outputs) 2 bytes organized as follows:

A byte	8 bits	at address 0
A byte	8 bits	at address 1



- Check that the settings are the same on PLC and system.



- Save the configuration by pressing this icon.

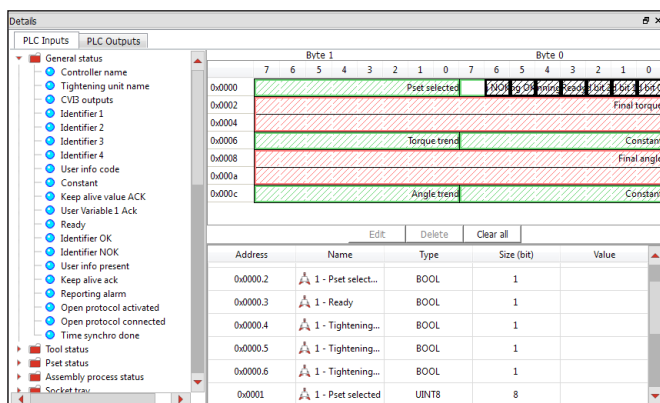
2.2.2 - Data mapping

- Once the hardware mapping has been defined, click "Data mapping".



- Note that hardware and data mappings can be different. The rule is to put a variable wherever a hardware item is present.

PLC inputs

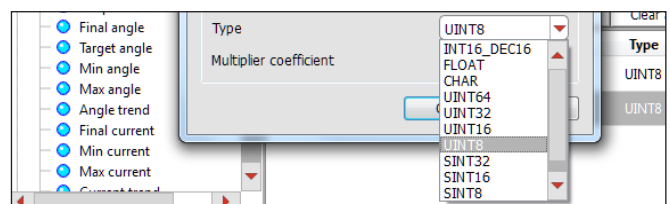


- Drag and drop the items from the left to the right to associate a variable to an address (e.g Pset selected, final torque, final angle).

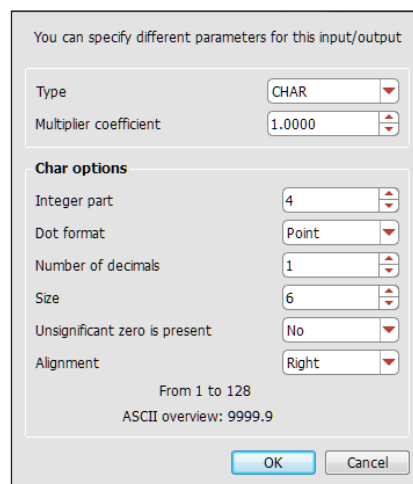
The default configuration is:

Address	Name	Description	Format	Size (bit)
0.0	Pset selected bit 0	Refer to Appendix - I/O events	BOOL	1
0.1	Pset selected bit 1		BOOL	1
0.2	Pset selected bit 2		BOOL	1
0.3	Ready		BOOL	1
0.4	Tightening running		BOOL	1
0.5	Tightening OK		BOOL	1
0.6	Tightening NOK		BOOL	1
1	Pset selected	ID of Pset currently selected	UINT8	8
2	Final torque	Final torque (last step)	FLOAT	32
6	Constant	Constant value	UINT8	8
7	Torque trend	Torque trend (last step) 0 = no result 1 = min 2 = max 3 = OK	UINT8	8
8	Final Angle Target	Final angle (last step)	FLOAT	32
12	Constant	Constant value	UINT8	8
13	Angle trend	Angle trend (last step) 0 = no result 1 = min 2 = max 3 = OK	UINT8	8

- Select the format of each variable.



If you choose "Char", extra parameters are necessary to set the ASCII string.



The "Size" is automatically computed. However, you can put a value to truncate value in memory.

You can also define a "multiplier coefficient". This coefficient is a value which is multiplied with the variable before being copied in memory. For example, you set "Multiplier Coefficient" to 10 ; then if the variable is equal to 2 then PLC will read 20 (=2x10).

PLC outputs

The principle is the same for the outputs.

Details

PLC Inputs PLC Outputs

General commands

- Pset commands
 - Pset selection
 - Pset selection bit 0
 - Pset selection bit 1
 - Pset selection bit 2
 - Pset selection bit 3
 - Pset selection bit 4
 - Pset selection bit 5
 - Pset selection bit 6
 - Pset selection bit 7
 - Select previous Pset
 - Select next Pset
 - External stop abort PSet
 - External stop to next step
 - Synchro in
- Assembly process commands
- Socket tray
- Customized protocol commands
- CVILOGM inputs
- Tool commands
- AP external inputs
- Open Protocol external inputs
- PLC external outputs

Byte 1 Byte 0

0x0000 7 6 5 4 3 2 1 0 7 6 5 4 3 2 1 0

Pset selection 0x00 0x00 0x00 0x00

Edit Delete Clear all

Address	Name	Type	Size (bit)	Value
0x0000.2	1 - Pset selecti...	BOOL	1	
0x0000.4	1 - Error ackn...	BOOL	1	
0x0000.5	1 - Start/stop t...	BOOL	1	
0x0000.6	1 - Reverse dir...	BOOL	1	
0x0000.7	1 - Reset	BOOL	1	
0x0001	1 - Pset selecti...	UINT8	8	



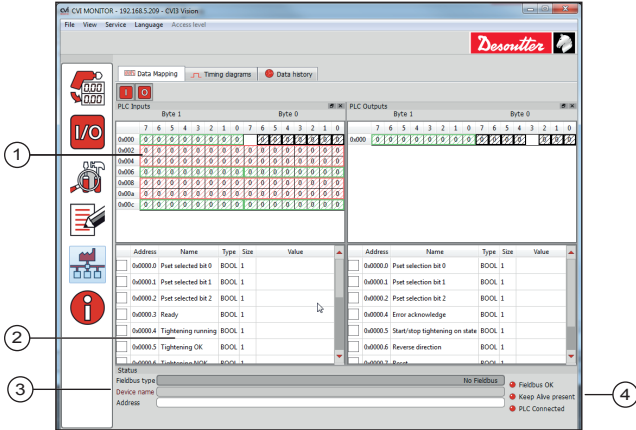
Fieldbus diagnostic

2.3 - How to diagnostic your programming

This section will help you to analyze the exchanges made between the PLC and the system via Fieldbus.

2.3.1 - Data mapping

The following screen shows the data mapping stored in the system.



- 1 Reading of the data mapping (bit format)
 - 2 Reading of the variables values
 - 3 Information about the Fieldbus module
 - 4 Communication status
- Click this button to display or hide the PLC inputs mapping.
 - Click this button to display or hide the PLC outputs mapping.

Information about the Fieldbus module

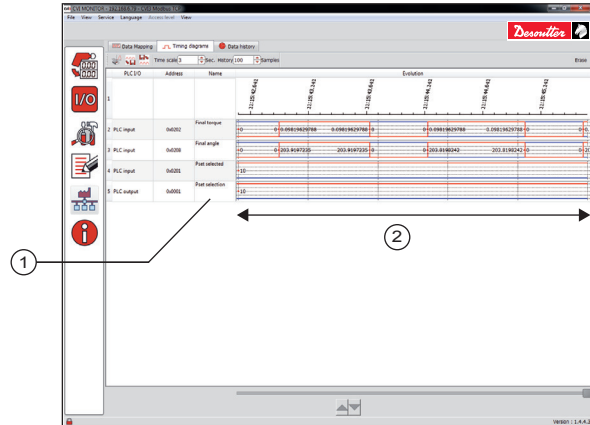
Fieldbus type	This is the type of Fieldbus module installed in the system.
Device name	Both fields depend on the type of Fieldbus module installed in the system.
Device address	Both fields depend on the type of Fieldbus module installed in the system.

Communication status

- Communication is "on".
- Communication is "off".

2.3.2 - Timing diagrams

The following screen shows the exchanged data in real-time. The graph is refreshed each time a variable value changes. The variables shown here have been selected in the "Data mapping" screen.



- 1 List of variables
- 2 Time scale in seconds (3 by default)



- Click this icon to print the timing diagrams



- Click this icon to export to a .xml file



- Click this icon to import from a .xml file

History

- Enter a value "x" in samples (100 by default). The x last variables change states will be stored in memory and the oldest results are overwritten by the last ones.

2.3.3 - Data history

Each row shows the state of the variables at a given time. History is updated at each variable change.

1 - DATA MAPPING TYPES AND VARIABLES

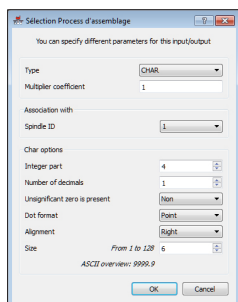
1.1 - Data type

- Choose the type of the data representation in memory:

Format	Description	Size (bytes)
Float	Floating point (IEE754)	4
Char	ASCII string	1..128
Uint32	Unsigned 32 bits	4
Uint16	Unsigned 16 bits	2
Uint8	Unsigned 8 bits	1
Sint32	Signed 32 bits	4
Sint16	Signed 16 bits	2
Sint8	Signed 8 bits	1
Bool	Boolean	1
INT16 DEC16	Integer part on 16 bits + decimal part on 16 bits.	4

1.2 - Char (ASCII string)

If you choose "Char", extra parameters are necessary to set the ASCII string:



The "Size" is automatically computed. However, you can put a value to truncate value in memory.

1.3 - Alignment

The floating point and integer values are first converted into a chain of characters and then aligned according to the selected option within the total size of the field.

Examples (green background denoting effective field length)

Value	Configuration						Data in PLC memory				
	Integer part	Dot format	Number of decimals	Size	Insignificant zero	Alignment					
4	4	No	0	4	No	Right			4		
4	4	No	0	4	No	Center			4		
4	4	No	0	4	No	Left	4				
4	2	Point	1	6	No	Right			4	.	0
4	2	Point	1	6	No	Center			4	.	0
4	2	Point	1	6	No	Left	4	.	0		
4	4	No	0	4	Yes	Right	0	0	0	4	
4	4	No	0	4	Yes	Center	0	0	0	4	
4	4	No	0	4	Yes	Left	0	0	0	4	
4	2	No	0	4	Yes	Right			0	4	
4	2	No	0	4	Yes	Center	0	4			
4	2	No	0	4	Yes	Left	0	4			

- Note that in case of centering if the resulting string of characters cannot be centered perfectly, more spaces are added on the left side of the string.

1.4 - Saturation

If the value exceeds the capacity of representation by the output string, then the maximal representable value is used instead.

Examples (alignment always "Right", green background denoting effective field length)

Value	Configuration				Data in PLC memory					
	Integer part	Dot format	Number of decimals	Size						
10000	4	No	0	4	9	9	9	9		
-10000	4	No	0	4	-	9	9	9		
99,99	4	No	0	4			9	9		
-99,99	4	No	0	4			-	9	9	
100	2	Dot	2	6		9	9	.	9	9
-100	3	Dot	2	6		-	9	9	.	9
-100	2	Dot	2	6			-	9	.	9
100	1	Dot	1	3	9	.	9			
-100	1	Dot	1	3	-	.	9			
10	1	No	0	1	9					
-1	1	No	0	1	0					

• Note that the "insignificant zeroes present" option has no impact on the maximal representable value.

1.5 - UINT32 UINT16 UINT8

Data are represented as unsigned integer binary. If value exceeds the capacity of selected type, then the maximal value of the specified type is used. Negative can not be represented.

Examples:

Value	Data in PLC memory		
	UINT8	UINT16	UINT32
99,99	99 (0x63)	99 (0x0063)	99 (0x00000063)
-99,99	0 (0x00)	0 (0x0000)	0 (0x0000000000)
999,9	255 (0xFF)	999 (0x03E7)	999 (0x000003E7)
9999	255 (0xFF)	9999 (0x270F)	9999 (0x0000270F)
9999,9	255 (0xFF)	9999 (0x270F)	9999 (0x0000270F)
99999	255 (0xFF)	65535 (0xFFFF)	99999 (0x0001869F)

1.6 - SINT32 SINT16 DINT8

Data are represented as signed integer binary. If value exceeds the capacity of selected type, then the maximal value of the specified type is used.

Examples:

Value	Data in PLC memory		
	INT8	SINT16	SINT32
99,99	99 (0x63)	99 (0x0063)	99 (0x00000063)
-99,99	-99 (0x9D)	-99 (0xFF9D)	-99 (0xFFFF9D)
999,9	127 (0x7F)	999 (0x03E7)	999 (0x000003E7)
9999	127 (0x7F)	9999 (0x270F)	9999 (0x0000270F)
9999,9	127 (0x7F)	9999 (0x270F)	9999 (0x0000270F)
99999	127 (0x7F)	16383 (0x7FFF)	99999 (0x0001869F)

1.7 - BOOL

Data are represented as a boolean using 1 byte (8 bits) signed integer binary. If value is equal to zero, then value seen by PLC is 0, otherwise value is 1. Negative values cannot be represented using this type.

Examples:

Value	Data in PLC memory
0	0
99,99	1
-99,99	0
999,9	1
9999	1
9999,9	1
99999	1

1.8 - INT16 DEC16

In this format, the integer is expressed in binary format in 16 bits and decimal part in the remaining 16 bits. The total number of digits is 4 and maximum number of digits is 2 which can be summarized as follows:

Digits for integer part	Digits for decimal part
1	2
2	2
3	1
4	0

Negative values cannot be represented using this format.

Examples:

Value	Data in PLC memory		
	Integer part	Decimal part	Complete value
99,99	99 (0x63)	99 (0x63)	0x00630063
-99,99	0	0 (0x0)	0x00000000
999,9	999 (0x03E7)	9 (0x9)	0x03E70009
9999	9999 (0x270F)	0 (0x0)	0x270F0000
9999,9	9999 (0x270F)	0 (0x0)	0x270F0000

1.9 - Multiplier coefficient

This coefficient is a value which is multiplied with the variable before being copied in memory. For example, you set "Multiplier Coefficient" to 10 ; then if the variable is equal to 2 then PLC will read 20 (=2x10).

1.10 - Inputs variables

Inputs variables are data coming from the system and sent to the PLC.

Name	Description	ASCII values	Numerical values or binary format	Reset condition	Set condition
General Status					
System name	System name			Never	System start or new configuration
Tightening unit name	Tightening Unit name			Never	System start or new configuration
Outputs	State of the 8 outputs				
"Identifier %1 ... Identifier %4"	Identifier #1 stored in result.			Tight start	Result received
User info code	"Info, error or warning" value displayed			Error, warning or info displayed.	"List of error and warning empty."
Constant	Used to set a constant read by the PLC.				
Keep alive value ack.	Mirror of "Keep Alive" value in PLC output.			System start	New value in Keep Alive Value
User Variable 1 ack.	Mirror of User Variable 1 in PLC output			System start	New value in User Variable 1
User variable 2 ack.	Mirror of User Variable 2 in PLC output			System start	New value in User Variable 2
Identifier echo	Last accepted identifier			System start	New value in User Variable 2
User info code on tightening unit	"Info, error or warning" value displayed (per Tightening Unit)			Error, warning or info displayed.	List of error and warning empty
Tool Status					
Tool model	Tool model connected (e.g. EAD50-900)	-	-	Tool disconnection	Tool connection
Tool serial number	Tool serial number	-	-	Tool disconnection	Tool connection
Tool max torque	Tool maximum torque in TU units	-	-	Tool disconnection	Tool connection
Tool max speed	Tool maximum speed in rpm	-	-	Tool disconnection	Tool connection
Spindle comment	Comment written in tool memory.	-	-	Tool disconnection	Tool connection
Tool calibration value 1	Calibration value for tool sensor 1	-	-	Tool disconnection	Tool connection
Tool calibration value 2	Calibration value for tool sensor 2	-	-	Tool disconnection	Tool connection

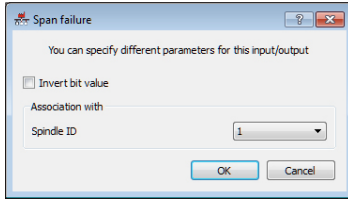
Name	Description	ASCII values	Numerical values or binary format	Reset condition	Set condition
Pset Status					
Pset selected	ID of Pset currently selected				
Tightening result	Tightening result	"A" = accepted "R" = rejected"	"0 = no result 1 = accepted 2 = rejected"	Tight start	Result received
Final torque	Final torque in N.m. (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.			Tight start	Result received
Torque trend	Torque trend (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.	"" "" "<" ">" "=""	"0 = no result 1 = min 2 = max 3 = accepted"	Tight start	Result received
Min. torque	Min torque (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.			Tight start	Result received
Target torque	Target torque (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.			Tight start	Result received
Max torque	Max torque (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.			Tight start	Result received
Final angle	Final angle in degrees (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.			Tight start	Result received
Angle trend	Angle trend (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.	"" "" "<" ">" "=""	"0 = no result 1 = min 2 = max 3 = accepted"	Tight start	Result received
Min. angle	Min angle in degrees (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.			Tight start	Result received
Target angle	Target angle in degrees (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.			Tight start	Result received
Max. angle	Max angle in degrees (last step); if used with additional transducer this value concerns the value of the transducer in charge of control.			Tight start	Result received
Final current	Final current in Amps (last step)			Tight start	Result received
Current trend	Current trend (last step)	"" "" "<" ">" "=""	"0 = no result 1 = min 2 = max 3 = accepted"	Tight start	Result received
Min current	Min current in Amps (last step)			Tight start	Result received
Max. current	Max current in Amps (last step)			Tight start	Result received
Final current %	Current in %			Tight start	Result received
Min. current %	Current in %			Tight start	Result received
Max. current %	Current in %			Tight start	Result received
Rundown speed	Rundown speed in rpm			Tight start	Result received
Downshift speed	Downshift speed in rpm			Tight start	Result received
Downshift torque	Downshift torque threshold			Tight start	Result received
Angle threshold	Threshold (in TU units) used to start angle measure.			Tight start	Result received
Torque offset	Torque offset applied			Tight start	Result received
Final torque without offset	Real torque applied to the joint without considering torque offset			Tight start	Result received

Name	Description	ASCII values	Numerical values or binary format	Reset condition	Set condition
Min torque rate in N.m/° (setting)	Min torque rate in N.m/° (setting)			Tight start	Result received
Target torque rate in N.m/° (setting)	Target torque rate in N.m/° (setting)			Tight start	Result received
Max. torque rate in N.m/° (setting)	Max torque rate in N.m/° (setting)			Tight start	Result received
Final (result) torque rate in N.m/°	Final (result) torque rate in N.m/°			Tight start	Result received
Torque rate trend	Torque rate trend	<pre> "" "" ""<"" "">"" ""= "" </pre>	"0 = no result 1 = min 2 = max 3 = accepted"	Tight start	Result received
Yield ratio in %	Yield ratio in % of N.m/°(setting)			Tight start	Result received
Min prevailing in N.m	Min prevailing in N.m			Tight start	Result received
Max prevailing in N.m	Max prevailing in N.m			Tight start	Result received
Min prevailing in N.m (setting)	Min prevailing in N.m (setting)			Tight start	Result received
Max prevailing in N.m (setting)	Max prevailing in N.m (setting)			Tight start	Result received
Final prevailing in N.m	Final (result) prevailing in N.m			Tight start	Result received
Prevailing trend	Prevailing trend	<pre> "" "" ""<"" "">"" ""= "" </pre>	"0 = no result 1 = min 2 = max 3 = accepted"	Tight start	Result received
Result type	Type of the result.		"0 : no result 1 : tightening 2 : run-reverse"	Tight start	Result received
Final torque (monitoring transducer)	Final torque (monitoring) in N.m. (last step)			Tight start	Result received
Torque trend (monitoring transducer)	Torque trend (monitoring) (last step)	<pre> "" "" ""<"" "">"" ""= "" </pre>	"0 = no result 1 = min 2 = max 3 = accepted"	Tight start	Result received
Final angle (monitoring transducer)	Final angle (monitoring) in degrees (last step)			Tight start	Result received
Angle trend (monitoring transducer)	Angle trend (monitoring) (last step)	<pre> "" "" ""<"" "">"" ""= "" </pre>	"0 = no result 1 = min 2 = max 3 = accepted"	Tight start	Result received
Result ID	Result ID			Tight start	Result received
Step number	Last executed step number			Tight start	Result received
Pulses number	Number of pulses done during tightening			Tight start	Result received
2nd Part Angle 1	Usually matching the angle reached during rundown phase				
2nd Part Angle 2	Final angle				
Current step number done	Current step number done				
Pulse trend (last step)	Pulse trend (last step)	<pre> "" "" ""<"" "">"" ""= "" </pre>	"0 = no result 1 = min 2 = max 3 = accepted"	Tight start	Result received
Nb pulses min	Pulse monitoring				
Nb pulses max	Pulse monitoring				
Final overall angle in degrees (last step)	Final overall angle in degrees (last step)				
Tightening step type	Tightening step type				

Name	Description	ASCII values	Numerical values or binary format	Reset condition	Set condition
Assembly Process Status					
AP selected	Id of Assembly process currently selected				
Batch size	Batch size (related to assembly process)			Tight start	Result received
Batch count	Batch count (related to assembly process)			Tight start	Result received
Batch remaining	Batch remaining (related to assembly process)			Tight start	Result received
Socket tray					
Socket lifted	Socket lifted. If a socket is left on CVI II socket tray then sockets on eBUS socket tray are not considered.			Never	Socket lifted
Socket lifted as bit	Socket lifted, each bit is encoding one socket (Socket tray must be in external mode). If a socket is left on CVI II socket tray then sockets on eBUS socket tray are not considered.			Never	Socket lifted
Socket Lifted and its address	Socket Lifted and its address (keep last address in case no sockets are lifted)	"DDLLL DD : deviceID LLL : lifted socket (255 if more than 1 socket)."	"Byte0 = DeviceID Byte1 = lifted socket position (255 if more than 1 socket)."	Never	Socket lifted
Customized protocol Status					
Q_PRG	Selected program number				
IIO_INO	"IIO : number of OK on 4 bits INO : number of OK on 4 bits"				
TSC	Place for status code				
Q_PI1	Ack workpiece-ID				
Q_FNR	Receiving tightening case number				
Q_TNR	Receiving tightening location number				
ECL	Error class				
ERC	Error code				
VEN	System brand code				
TYP	System type code	-	-	-	-
CVILOGIX outputs					
"CVILOGIX %1 CVILOGIX %100"	CVILOGIX variable (1 to 100)	-	-	-	-

1.11 - Events in PLC input

All output events can be associated to PLC inputs in Fieldbus.
For each event, you can choose to invert or not the signal.



1.12 - Outputs variables

Name	Description
General commands	
Inputs	State of the 8 system inputs that can be forced by the PLC.
Identifier	Identifier (e.g. VIN number) which can be used to start an assembly process
Keep alive value	Value that will be copied in Keep Alive Value Ack. Value change can be used as heartbeat management.
User variable 1	A variable freely settable by user. No treatment is made on this value. This value is copied in User Variable 1 Ack.
User variable 2	A variable freely settable by user. No treatment is made on this value. This value is copied in User Variable 2 Ack.
Date synchro data	"Date synchronisation data. Format is YYYYMMDD in ASCII."
Time synchro data	"Time synchronisation data. Format is HHMMSS in ASCII"
Pset commands	
Pset selection	ID of Pset expected by PLC
Assembly Process commands	
AP selection	"Id of Assembly process expected by PLC. If the Assembly process #0 is requested, then the current assembly process is aborted. The system behavior can be adapted by using the "Assembly process" panel in general configuration"
Socket tray	
Socket green led as bit	Control green led of socket trays. In binary each bit is encoding one socket. In ASCII each digit is encoding one socket. Socket tray must be in external mode.
Socket red led as bit	Control red led of socket trays. In binary each bit is encoding one socket. In ASCII each digit is encoding one socket. Socket tray must be in external mode.
Customized protocol Status	
PRG	Tightening program number in range 1-255.
SIO_MNO	"SIO : number of OK on 4 bits MNO : max number of NOK on 4 bits"
CIO_CNO	"CIO : class for OK tightenings on 4 bits CNO : class for NOK tightenings on 4 bits"

Name	Description
PRT	Model description.
PI1	Unique workpiece ID
STC_VAR	"STC : XML 2.0 VAR : XML 2.1"
FNR	Tightening case number
TNR	Tightening location number
WID	Workpiece carrier-ID
PNR	Profinet XML version
CVILOGIX inputs	
"CVILOGIX %1 ... CVILOGIX %100"	CVILOGIX variable (1 to 100)

1.13 - Events in PLC output

All input events described in the user manual can be associated to PLC output in Fieldbus. For each event you can choose to invert or not the signal. Note that you can associate up to 4 input events to a unique bit in PLC output. This allows you to set several events at the same time.

1.14 - Bypass between PLC and IO

For some reasons, you may want to directly control inputs/ outputs by PLC without any treatment on it.

External input/output bits are dedicated to this usage.

Example: to read a physical input in PLC memory.

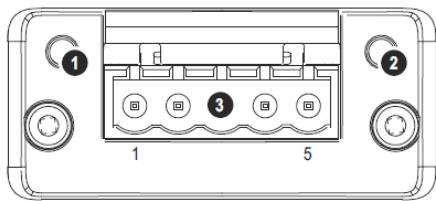
- First, associate a input to an "External inputs PLC bit" in "I/O and accessories" panel:
- Secondly, associate the "external PLC bit" to the PLC Inputs.

You can now read in PLC the state of the physical input.

The principle is the same for the outputs.

2 - MODULES DETAILED DESCRIPTION

2.1 - DeviceNet



#	Item
1	Network Status LED
2	Module Status LED
3	DeviceNet Connector

Network Status

State	Indication
Off	Not online / No power
Green	On-line, one or more connections are established
Flashing Green (1 Hz)	On-line, no connections established
Red	Critical link failure
Flashing Red (1 Hz)	One or more connections timed-out
Alternating Red/Green	Self test

Module Status

State	Indication
Off	No power
Green	Operating in normal condition
Flashing Green (1 Hz)	Missing or incomplete configuration, device needs commissioning
Red	Unrecoverable Fault(s)
Flashing Red (1 Hz)	Recoverable Fault(s)
Alternating Red/Green	Self test

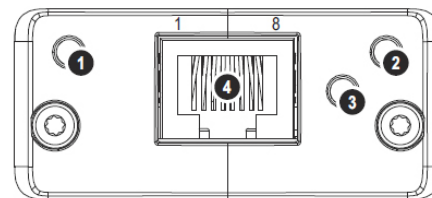
DeviceNet Connector

This connector provides DeviceNet connectivity.

Pin	Signal	Description
1	V-	Negative bus supply voltage *
2	CAN L	CAN low bus line
3	SHIELD	Cable shield
4	CAN H	CAN high bus line
5	V+	Positive bus supply voltage *

* DeviceNet bus power. For more information, refer to DeviceNet "Technical Specification".

2.2 - Ethernet/IP



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

Network Status LED



A test sequence is performed on this LED during startup.

LED State	Description
Off	No power or no IP address
Green	On-line, one or more connections established (CIP Class 1 or 3)
Green, flashing	On-line, no connections established
Red	Duplicate IP address, FATAL error
Red, flashing	One or more connections timed out (CIP Class 1 or 3)

Module Status LED



A test sequence is performed on this LED during startup.

LED State	Description
Off	No power
Green	Controlled by a Scanner in Run state
Green, flashing	Not configured, or Scanner in Idle state
Red	Major fault (EXCEPTION-state, FATAL error etc.)
Red, flashing	Recoverable fault(s)

LINK/Activity LED

LED State	Description
Off	No link, no activity
Green	Link established
Green, flickering	Activity

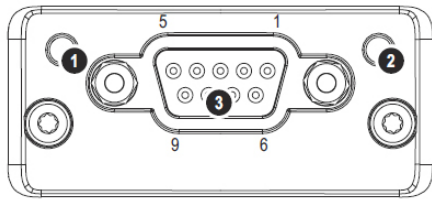
Ethernet Interface

The Ethernet interface supports 10/100Mbit, full or half duplex operation.

Ethernet IP module characteristics

Speed	10 and 100Mbps/s supported
Duplex	Half and full supported
EDS file release	2.2
WebServer	Internal webserver in module allowing setting connection parameters (IP address).

2.3 - Profibus



#	Item
1	Operation Mode
2	Status
3	PROFIBUS Connector

Operation Mode

State	Indication
Off	Not online / No power
Green	On-line, data exchange
Flashing Green	On-line, clear
Flashing Red (1 flash)	Parametrization error
Flashing Red (2 flashes)	PROFIBUS Configuration error

Status

State	Indication	Comments
Off	No power or not initialized	state = 'SETUP' or 'NW INIT'
Green	Initialized	module has left the 'NW INIT' state
Flashing Green	Initialized, diagnostic event(s) present	Extended diagnostic bit is set
Red	Exception error	state = 'EXCEPTION'

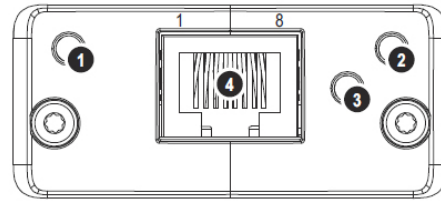
PROFIBUS Connector (DB9F)

Pin	Signal	Description
1	-	-
2	-	-
3	B Line	Positive RxD/TxD, RS485 level
4	RTS	Request to send
5	GND Bus	ground (isolated)
6	+5V Bus Output *	+5V termination power (isolated, short-circuit protected)
7	-	-
8	A Line	Negative RxD/TxD, RS485 level
9	-	-
Housing	Cable Shield	Internally connected to the protective earth via cable shield filters according to the PROFIBUS standard.

* The current drawn from this pin will affect the total power consumption. To simplify development, the output supplies up to 60mA when operated in room temperature (20 - 22 degrees Celsius), which is sufficient to power e.g. master

simulators etc. During normal operating conditions (or higher temperatures), i.e. in an industrial environment, the specified max. current for this output is 10mA.

2.4 - Profinet 1 port



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

Network Status LED



A test sequence is performed on this LED during startup.

LED State	Description	Comments
Off	Offline	- No power - No connection 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



A test sequence is performed on this LED during startup.

LED State	Description	Comments
Off	Not Initialized	No power - or - Module in 'SETUP' or 'NW INIT' state
Green	Normal Operation	Module has shifted from the 'NW 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

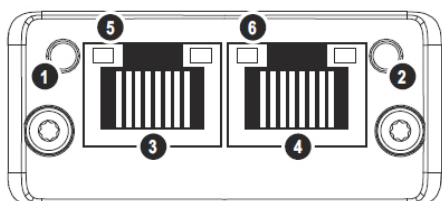
LINK/Activity LED

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.

2.5 - Profinet 2 ports




#	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

 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

 A test sequence is performed on this LED during startup.

LED State	Description	Comments
Off	Not Initialized	No power - or - Module in 'SETUP' or 'NW INIT' state
Green	Normal Operation	Module has shifted from the 'NW 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'

LED State	Description	Comments
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

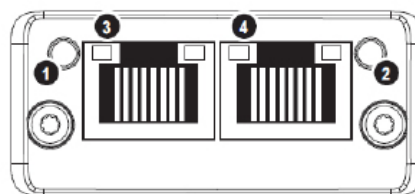
LINK/Activity LED

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.

2.6 - Profinet IRT



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

Network Status LED

 A test sequence is performed on this LED during startup.

LED State	Description	Comments
Off	Offline	- No power - No connection with I/O
Green	Online (RUN)	- Connection with I/O established - IO in RUN state
Green, 1 flash	Online (STOP)	- Connection with I/O established - I/O in STOP state or - I/O data wrong - IRT synchronization not finished
Green, blinking	Blink	Used by engineering tools to identify the system on the network
Red	Fatal event	Major internal error (this indication is combined with a red module status LED)

LED State	Description	Comments
Red, 1 flash	Station Name error	Station Name not set
Red, 2 flashes	IP address error	IP address not set
Red, 3 flashes	Configuration error	Expected Identification differs from Real Identification

Module Status LED



A test sequence is performed on this LED during startup.

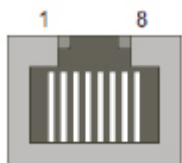
LED State	Description	Comments
Off	Not Initialized	No power - or - Module in 'SETUP' or 'NW INIT' state
Green	Normal Operation	Module has shifted from the 'NW INIT' state
Green, 1 flash	Diagnostic Event(s)	Diagnostic event(s) present
Red	Exception Error	Device in state 'EXCEPTION'
	Fatal event	Major internal error (this indication is combined with a red network status LED)
Alternating Red/Green	Firmware update	<ul style="list-style-type: none"> Do NOT power off the module. Turning the module off during this phase could cause permanent damage.

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

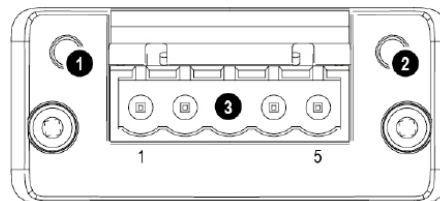
Ethernet Interface

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



Pin no.	Description
1, 2, 4, 5	Connected to chassis ground over serial RC circuit
3	RD-
6	RD+
7	TD-
8	TD+
Housing	Cable shield

2.7 - CC-Link



#	Item
1	Run LED
2	Error LED
3	CC-Link interface

Run LED



A test sequence is performed on this LED during startup.

LED State	Description
Off	No network participation, timeout status (no power)
Green	Participating, normal operation
Red	Major fault (FATAL error)

Error LED

LED State	Description
Off	No error detected (no power)
Red	Major fault (Exception or FATAL event)
Red, flickering	CRC error (temporary flickering)
Red, flashing	Station Number or Baud rate has changed since startup (flashing)

CC-Link Interface

Pin	Signal	Description
1	DA	Positive RS485 RxD/TxD
2	DB	Negative RS485 RxD/TxD
3	DG	Signal Ground
4	SLD	Cable Shield
5	FG	Protective Earth

APPENDIX - IO EVENTS

1 - I/O EVENTS - LOGICAL INPUT

1.1 - General commands

Name	Description	Status
Start stop Tightening on state	<p>Initiates a fastening cycle if:</p> <ul style="list-style-type: none"> - the ""Spindle validation forward"" is active and required by the tightening unit, - a Pset is selected. <p>A rising edge must be detected to initiate a tightening, that is the change in the state of the tool from off to on as the trigger is released, then pressed again must be detected. For the tightening to proceed, this input must remain active. If this input becomes inactive at any time during the tightening, the tightening will be aborted and the tool will stop running. At the end of tightening, a tightening can began only if signal falls and then rise. After power-up, even if this signal is active, an edge is necessary to start tightening."</p>	State
Toggle start stop tightening on edge	<p>This input is enabled for fixed tools only (tools without trigger). Initiates or ends a fastening cycle.</p> <p>A cycle can be initiated only if:</p> <ul style="list-style-type: none"> - the ""Spindle validation forward"" is active and required by the tightening unit - the Pset is selected. <p>If no tightening is currently executed, a rising edge will initiate a tightening. A falling edge has no effect on the tightening to proceed. If a tightening is in execution, a rising edge will stop it."</p>	Rising edge
Reverse direction	<p>When activated, the tool green & red lights are flashing to indicate that the tightening unit reverse direction is selected. This signal status is not controlled during a tightening but only when tool is not running.</p>	State
Error acknowledge	<p>Enables the "Reject lockout" function. When locked out, the tool cannot run until this input is reset.</p>	Rising edge
Reset	<p>When input reset raises (and there is no cycle running):</p> <ul style="list-style-type: none"> - defaults are acknowledged - batch counter of current Assembly Process is reset - reports lights on controller and tool are set off - result on display is erased but the last 5 result values on Vision display stay readable - in Pset mode, Pset selected remains unchanged. In AP mode, AP is aborted. - ready output stay on - echo identifier is reset <p>When input reset raises (and there is cycle running):</p> <ul style="list-style-type: none"> - tightening is immediately stopped - defaults are acknowledged - batch counter of current Assembly Process is reset - at tightening end, there is no report generated. - at tightening end, it is impossible to start a new tight, reset input must be released first. - in Pset mode, Pset selected remains unchanged. <p>In AP mode, AP is aborted.</p> <ul style="list-style-type: none"> - ready output stay on - echo identifier is reset 	State

Name	Description	Status
Reset only status	When input reset raises (and there is cycle running): - tightening is immediately stopped Resets only: - Tightening OK/NOK - Spindle OK/NOK - Pset finished - Pset finished no timeout - Batch OK/NOK/Finished The Assembly Process is not aborted. Result values (angle, torque) are still present in Fieldbus. LEDs on tool and system are not affected.	State
Ack error message	Acknowledge error message displayed on HMI.	Rising edge
Force Pset mode	Forces the Tightening unit to switch in Pset mode in order to temporary run Psets (nothing saved). When AP mode + input state high, then switch to Pset mode. When Temporary Pset mode + input state low, then switch to AP mode. Switching on the system power with the input set will switch to Pset mode. Other cases do nothing."	State
Ack result	Acknowledges the current result. The tool is then unlocked and can tight again. Formerly dedicated to Fieldbus only, this behaviour is now also available for IOs and OpenProtocol	Rising edge
Keep alive	Input used to check that the controller is still alive. State of this input is copied to "Keep alive ack" output. This input is also used by a PLC to inform the controller that Fieldbus communication is working.	State
Time Synchro Trigger	Execute date & time synchronisation from Fieldbus (SYN in VVXML Protocol)	Rising edge
Enable access manager	Enable/disable access manager	State
Lock display	Lock/unlock the controller display.	State
Restart controller	Reboots the controller. Everything must be done by software before using this input	Rising edge
Reset identifiers	Erase all ongoing accepted identifiers fields from system/tool memory in order to guarantee a correct traceability	Rising edge

1.2 - Tool commands

Name	Description	Status
Tool validation forward	Enables the tool to run the selected Pset. Note: the forward and reverse validation can be done by setting both validations on the same input. When the validation signal falls down, the tool stops.	State
Tool validation reverse	Enables the tool run reverse. Note: the forward and reverse validation can be done by setting both validations on the same input. When the validation signal falls down, the tool stops.	State
Reset tool locks	Reset tool locks, only the none safety tool locks will be affected	Rising edge
Tool stop	Stops the tool.	Rising edge
Tool blue light ctrl by IO	1 = tool blue light is controlled by IO 0 = tool blue light is managed by the controller	State
Tool blue light	If "tool blue light ctrl by IO" is set to 1 (see upward) then: 1 = tool blue light is set to on 0 = tool blue light is set to off	State
Tool green light ctrl by IO	1 = tool green light is controlled by IO 0 = tool green light is managed by the controller	State
Tool green light	If "tool green light ctrl by IO" is set to 1 (see upward) then: 1 = tool green light is set to on 0 = tool green light is set to off	State
Tool red light ctrl by IO	1 = tool red light is controlled by IO 0 = tool red light is managed by the controller	State

Name	Description	Status
Tool red light	If "tool red light ctrl by IO" is set to 1 (see upward) then: 1 = tool red light is set to on 0 = tool red light is set to off	State
Tool yellow light ctrl by IO	1 = tool yellow light is controlled by IO 0 = tool yellow light is managed by the controller	State
Tool yellow light	If "tool yellow light ctrl by IO" is set to 1 (see upward) then: 1 = tool yellow light is set to on 0 = tool yellow light is set to off	State
Tool white light ctrl by IO	1 = tool white light is controlled by IO 0 = tool white light is managed by the controller	State
Tool white light	If "tool white light ctrl by IO" is set to 1 (see upward) then: 1 = tool white light is set to on 0 = tool white light is set to off	State
Reset of redundancy error	Resets only redundancy error	State

1.3 - Pset commands

Name	Description	Status
Pset select bit (0..7)	Used to select Psets. These inputs must be in the desired state BEFORE the activation of the cycle start input. If the selected Pset is zero, there is no Pset selected.	State
Select previous Pset	Select lower number Pset.	Rising edge
Select next Pset	Select higher number Pset.	Rising edge
External stop abort Pset	This input is used with proximity detectors to end immediately Pset running. The user can choose which state or transition will stop the Pset: No, Rising, Falling, Change, High, Low. When a Pset is aborted with this input, the Pset result is NOK.	"rising edge or state
External stop to next step	This input is used with proximity detectors to end the running step. The user can choose which state or transition will stop the Pset : No, Rising, Falling, Change, High, Low. The user can also choose the step result when the stop request occurs: OK, NOK, Monitoring (Monitoring means that the result is computed depending on monitoring requested).	"rising edge or state
Synchro in	Step synchronisation input. The step starts when a transition to 0 is detected.	State
External tool inputs bit (0..9)	Indicates that these inputs can be used by external tool (to generate OK/NOK report for example)	State

1.4 - Assembly Process commands

Name	Description	Status
Assembly process selection bit (0-7)	Used to select an Assembly process. These inputs must be in the desired state BEFORE the activation of the assembly process start input.	Rising edge
Abort assembly process (tightening unit)	The "Abort assembly process" input stops the Assembly process being processed. The Assembly process is finished. The Assembly process result is memorized as "aborted" and "AP aborted" and "AP NOK" events are set.	Rising edge
Batch-1	The "Batch-1" input allows the operator to select the previous operation of a batch whatever the result of the next operation. The batch counter is decremented. The action is recorded OK or NOK according to the result and "Batch-1 event" is set.	Rising edge
Batch+1	In case you cannot complete the current operation of a batch, jump to the next one by using the external input "Batch+1". The action is declared as NOK and "Batch+1" event is set.	Rising edge
Restart batch	Restarts the current batch of the current Assembly Process step. The "Restart batch" event is set.	Rising edge
Reset number of retries	Reset the number of retries counter. If the max counter has been reached the tool is unlocked	Rising edge

1.5 - External input

Name	Description	Status
External in AP bit (0..49)	Inputs used in Assembly process in start conditions or in assembly actions sense input	Rising edge
External In PLC bit (0..9)	Indicates this input can be used by an PLC via Fieldbus (like a remote I/O). For PLC side, it is an input.	State
External In Open Protocol 1-8	Inputs used in Open Protocol. They can be monitored from the Open Protocol client by subscription. These inputs are named "External monitored 1..8" in Open Protocol specification.	State

1.6 - Socket tray

Name	Description	Status
Socket lifted bit (0..4)	Used with CVI II controllers only: 24V socket trays (BSD). Informs which socket has been lifted.	State

1.7 - Customized Protocol commands

Name	Description	Status
PFCS End Of Cycle	Input used in PFCS Chrysler to flush the result FIFO when the operator has completed the work	Rising edge
SAS	Starts tightening job	State
RST	Resets any running tightening job	State
LSN	Disables reverse	State
TOL	Tool validation	State
STR	Tool start	State
EDZ	Resets results	State
XMS	Synchronous XML	State
XMA	XML activated	State

1.8 - CVILOGIX

Name	Description	Status
External In CVILOGIX bit (0..100)	Indicates that this input can be used by an internal CVILOGIX application	State
CVILOGIX validation	Enables CVILOGIX to lock/unlock the tool.	State

2 - I/O EVENTS - LOGICAL OUTPUT

2.1 - General status

Name	Description	Raising condition Falling condition
Ready	The system is free of any internal issue that could prevent it from being fully operative. Communication between system and tool is OK.	No error in system nor in tool Quick stop activated Error coming from the system
Identifier OK	Identifier received (e.g. barcode) matches masks (stays during 0,5 s at active level).	Identifier received and identified 0,5 s after rising
Identifier NOK	Identifier received (e.g. barcode) does not match masks (stays during 0,5 s at active level).	Identifier received but not identified 0,5 s after rising
User info present	User info (Info, Warning or Error) is present.	User info present on screen No user info on screen
Keep alive ack	This output is the copy of the "Keep alive" input. It can be used by the PLC to check the system is still running.	When "Keep alive" input raises. When "Keep alive" input falls.
Fieldbus Fault	No Fieldbus. The "Fieldbus fault" is on as long as the Fieldbus communication is not established. It switches off automatically when the communication works again.	Communication lost and/or keep alive missing. Fieldbus communication established and keep alive present
Reporting Alarm	When working with ToolsNet or CVINet: FIFO Threshold Alarm reached. Results are stored in the system memory and are erased when sent to ToolsNet or CVINet. This way the system memory will never be full. A full system memory induces result losses and traceability error. To detect communication issues with ToolsNet or CVINet, the software measures the fill in rate (%) of the memory. When the rate overpasses the target threshold, the Reporting alarm will switch on; maintenance operators are then able to solve the issue before losing results."	FIFO Threshold Alarm reached FIFO under threshold alarm.
Open Protocol activated	Open Protocol is activated in configuration	Protocol is enabled Protocol is disabled
Open Protocol connected	Open Protocol is connected to the Tightening Unit	At least 1 peer connected No peer is connected
Time synchro done	Time synchronisation completed successfully using Fieldbus data (Q_SYN in VWXML)	-
Emergency stop	Emergency stop is activated.	Emergency stop activated Emergency stop deactivated
TU running	This indicates that the fastening operation has actually started: at least one involved tool is running. The signal switches off as soon as the fastening operation is finished (all reports sent).	Pset is started. The fastening operation is finished (all reports sent)

2.2 - Tool status

Name	Description	Raising condition Falling condition
Tool ready	The tool is ready: - communication between system and tool is ok - a valid Pset has to be selected - the tightening strategy must cope with the tool"	Tool connected AND valid Pset. Tool disconnection, Pset selection.
Tool not locked forward	There is no tool lock in forward direction.	Tool unlocked in forward direction New lock in forward direction
Tool not locked reverse	There is no tool lock in reverse direction.	Tool unlocked in reverse direction New lock in reverse direction
Tool running	The tool is running (CW or CCW, tightening or loosening).	Tool starts to run. Turns off when the tool stops.
Tool direction	Indicates if the tool is in tightening mode. Active: tightening mode Inactive: run reverse mode Note: independent if tool is running or not.	Entering tightening mode. Entering run reverse mode.
Tool tightening	Tool is running in tightening mode. Pset threshold is not taken into account.	Tool start in tightening mode. Tool stops.
Tool middle course trigger	Reflects the raw state of tool middle course start trigger, independently from the "Tightening Unit" state.	Middle course of main trigger is reached. Main trigger is completely released.
Tool main start trigger	Reflects the raw state of tool main course start trigger, independently from the "Tightening Unit" state.	Trigger is pushed. Trigger is released
Tool reverse trigger	Reflects the raw state of tool reverse trigger, independently from the "Tightening Unit" state. (reverse or forward).	Trigger is pushed. Trigger is released
Tool push start or front start trigger	Reflects the raw state of tool push start or front start trigger, independently from the "Tightening Unit" state.	Trigger is pushed. Trigger is released
Manual reverse in progress	The operator has selected the reverse direction on the tool and is running the tool.	Manual runreverse selected and trigger pushed. Stay on as long as the operator is running the tool
Fastener loosened	There is a fixed minimum torque value to declare that the fastener was "loosened".	Run reverse Result generation. New start (tool trigger or external start)
Tube nut open	Indicates that the tube nut is open. The tool can be removed from the assembly.	- Tool running
Tool maintenance alarm	Reflects the different tool maintenance alarm state with or condition.	Tool maintenance alarm 1 or 2 is active. No tool maintenance alarm is active.
Invalid spindle settings	Tool characteristics does not match Pset parameters (e.g. negative jog times or contradictions, torque over the maximum tool torque range, speed over the maximum tool speed, maximum tool torque range, etc...)	Pset selection or tool connection. Tool disconnection or new Pset selected.
Span failure	When starting a tightening, before running the tool, the system checks the torque span. "Span failure" indicates that the span drifts by $\pm 3\%$ or more, causing a tool lockout. This fault can be due to the torque transducer or the tool electronics. The only solution is to replace the tool.	Span failure detection. Disconnecting tool or new check without fault.
Offset failure	Indicates the offset (0 point) drifts by 50 % of full scale or more. This error exists when, at the beginning of the Pset, the torque transducer is seen to have 50 % or more of full-scale torque prior to even starting the motor. With an "Offset failure", the system cannot adequately compensate for this transducer error and, therefore, will not allow a tightening operation to occur. The only solution is to replace the tool.	Offset failure detection Disconnecting tool or new check without fault.
Motor over temperature	Indicates that the temperature of the tool motor windings has exceeded the temperature threshold. An error message remains.	Temperature threshold: - 100°C for fixtured tools - 60°C for portable tools The signal turns off as soon as the temperature returns below the threshold (minus hysteresis = 10°C).

Name	Description	Raising condition Falling condition
Angle measurement fault	Drive detected angle sensor fault. It can be an angle sensor fault, a tool electronic fault or a combination of both. The communication is tested permanently. As soon as the fault disappears, the signal turns off.	Angle fault detection. Disconnecting tool
No tool connected	Indicates that the system is not detecting the tool. Systems are designed to work with a range of fastening tools. The tools have an Intelligent tool Interface (ITI) board which is continuously sending status information to the system. If the system requests status information from the tool and gets no response, the system software turns on the "No tool connected" output. This output resets immediately upon successful communication with a tool.	No tool connected or tool not recognized Tool connected and recognized.
Redundancy error	Redundancy error in case of operational control transducer and faulty monitoring transducer.	Result generation Use of "reset of redundancy error" input, change of tool free of this error

2.3 - Pset status

Name	Description	Raising condition Falling condition
Pset selected bits (0..7)	Echoes the binary "Pset select bit 0 to 7" input if the corresponding Pset exists, echoes 0 if the Pset does not exist or if there is no Pset selected.	New Pset selected New Pset selected
Tightening running (old cycle declared)	This indicates that the fastening operation has actually started: the tool is running and the torque is over the Pset start torque threshold. The signal switches off as soon as the fastening operation is finished (all reports sent).	Torque reach the cycle start threshold. The fastening operation is finished (all reports sent)
Tightening finished	Indicates that a Pset report is available.	Result generation. New start (tool trigger or external start) or reset input
Tightening OK	Indicates that the fastening operation (for a specific Tightening Unit) ends correctly and that all controlled and monitored tightening parameters are within tolerances.	Result generation. New start (tool trigger or external start) or reset input
Tightening NOK	Indicates that the fastening operation (for a specific Tightening Unit) has failed.	Result generation. New start (tool trigger or external start) or reset input
Spindle OK	Indicates that the fastening operation (for a specific tool) ends correctly and that all controlled and monitored tightening parameters are within tolerances.	Result generation. New start (tool trigger or external start) or reset input
Spindle NOK	Indicates that the fastening operation (for a specific tool) has failed.	Result generation. New start (tool trigger or external start) or reset input
Angle low	Indicates a low angle reject. The angle must meet or exceed this value for a correct Pset. When the angle stays below this value, it becomes a "Low angle reject" and this output is turned on. Stays on until a new fastening operation starts.	Result generation. New start (tool trigger or external start) or reset input
Angle OK	Indicates a correct angle. The angle is inside the limits declared in the step.	Result generation. New start (tool trigger or external start) or reset input
Angle high	Indicates a high angle reject. The angle must stay below this value to be a correct Pset. When the angle meets or exceeds this value, it becomes a "High angle reject". The tool will stop when this limit is reached and this output is turned on. Stays on until a new fastening operation starts.	Result generation. New start (tool trigger or external start) or reset input

Name	Description	Raising condition Falling condition
Torque low	Indicates the peak torque low reject. If the torque stays below the "Peak torque low limit" and results in a "Reject" Pset. This can happen when a Pset is prematurely finished, a thread strips out or when the Pset is automatically finished due to other error conditions, such as a High angle fault or when a Pset Time Monitor expires and causes the Pset to be terminated. Stays on until a new fastening operation starts.	Result generation. New start (tool trigger or external start) or reset input
Torque OK	Indicates a correct torque. Torque is in inside limits declared in the step.	Result generation. New start (tool trigger or external start) or reset input
Torque high	Indicates the peak torque high reject. When the torque meets or exceeds this value, this output is turned on and the result is NOK. If a <code>Peak Torque High</code> error persists, it may be advisable to slow down the tool speed or replace the tool with one of lesser capacity. A second variable that can cause errors is a badly chattering joint. Chatter is the squawking noise you hear on some fasteners at the end of the fastening operation. Chatter is induced by slip-stick and actually causes the fastener to momentarily stop rotating, then crack loose and re-start turning. This condition can cause a <code>Peak Torque High</code> condition. Stays on as long as a new fastening operation starts.	Result generation. New start (tool trigger or external start) or reset input
Yellow report on tightening system	This output reflects the state of the system yellow light.	System yellow light is on New fastening operation starts
Green report on tightening system	This output reflects the state of the system green light.	System green light is on New fastening operation starts
Red report on tightening system	This output reflects the state of the system red light.	System red light is on New fastening operation starts
Lock on reject	Indicates that a tool is locked out because of an incorrect tightening operation. The system will not continue to run the tool depending on "lock on reject option " : - until the ""Error Acknowledge"" input is activated - until a run reverse operation - until a loosening operation	Tightening finished with bad result and option "lock on reject" activated. Input "Error acknowledge" activated or runreverse operation or loosening operation.,
Remove fastener	Indicates that the fastening operation resulted in a torque that exceeded the "Remove Fastener" setpoint. When correctly set, this means that the torque for any reason becomes very high. There is a risk that the fastening operation is not reliable: disassemble the joint and check parts.	Result generation. New start (tool trigger or external start) or reset input
Tightening finished without timeout	Indicates that a Pset report is available and the source stop is not overall timeout.	Result generation. New start (tool trigger or external start) or reset input
Overall time reached	Max overall time has been reached during tightening	Result generation. New start (tool trigger or external start) or reset input
Synchro out	Synchro output : set to 1 when running step starts, reset to 0 when a synchro step is reached.	Start of running step. Synchro step reached
Invalid parameter set selected	Indicates the Pset is disabled (has not been set). For example, if 3 Psets are used, Psets 1, 2 and 3 are enabled. If, however, any Pset other than 1, 2 or 3 is selected, the Pset is invalid and this output is turned on. It is possible for an Assembly process to select invalid Psets.	Pset unselection Pset selection

2.4 - Assembly Process status

Name	Description	Raising condition Falling condition
Assembly Process selected bits (0..7)	Indicates the Assembly Operation per tightening unit currently selected (Bit 0..7).	New AP selected. AP aborted New AP selected. AP aborted
Assembly process running	Indicates the assembly operation is being processed. The signal is on as long as the assembly operation is running. The signal falls down when the assembly operation is finished.	Assembly process start. Assembly process finished or aborted.
Assembly process finished	Indicates when an assembly operation is completed.	Assembly process finished. A new Assembly Process start or reset input
Assembly process OK	Indicates when an assembly operation is completed with no rejects. The signal stays on as long as a new Assembly process starts.	Assembly process finished and OK. A new Assembly Process start or reset input
Assembly process NOK	Indicates when an Assembly process reject occurs. Stay on as long as a new Assembly process starts.	Assembly process finished and NOK or aborted. A new Assembly Process start or reset input
Assembly process aborted	When an Assembly process has been aborted, "Assembly process aborted" is activated. Stays on as long as a new Assembly process starts.	Assembly process aborted. A new Assembly Process start or reset input
Current batch count bit (0..6)	Bit indicator of current batch count	Batch count increment When batch is finished, new start (tool trigger or external start) or reset input or new AP selection
Remaining batch count bit (0-6)	Bit indicator of the number of remaining bolts in the batch	Batch count increment When batch is finished, new start (tool trigger or external start) or reset input or new AP selection
Batch running	A batch process is underway. The output is set to 1 before the first tightening operation.	A batch operation is enabled Batch is finished or reset input
Batch finished	Indicates when the batch count equals the batch size and the batch is declared completed. It is used together with "Batch OK" to indicate the status of a batch.	Batch is finished. New start (tool trigger or external start) or reset input
Batch OK	Such as when the batch gets aborted...or in the case rejects are included as part of the batch count (managed by Assembly Process).	Batch is finished and NOK. A new AP has been selected. New start (tool trigger or external start) or reset input
Batch NOK	Such as when the batch gets aborted...or in the case rejects are included as part of the batch count (managed by Assembly Process).	Batch is finished and NOK. A new AP has been selected. New start (tool trigger or external start) or reset input
Max retries reached	Indicates when max number of retries is reached.	Max number of retries is reached. Max number of retries is reset.

2.5 - External output

Name	Description	Raising condition Falling condition
External Out AP bit	Outputs that can be set or reset within an Assembly process	Depending of AP behavior Depending of AP behavior
External Out PLC bit (0..9)	Indicates this output is controlled by a PLC via Fieldbus (like a remote I/O). On PLC side, it is an output.	Depending on PLC behavior Depending on PLC behavior
External Out OP bit (0..9)	Outputs dedicated to Open Protocol.	Depending on OP behavior Depending on OP behavior

2.6 - Socket tray

Name	Description	Raising condition Falling condition
Socket selectable (0..4)	24 V socket trays (BSD). Informs which socket can be taken by the operator.	A new socket has to be taken by the user. No socket to be taken by the user.

2.7 - Customized Protocol Status

Name	Description	Raising condition Falling condition
Customer Protocol activated	A customer Protocol has been activated in configuration	Protocol is enabled Protocol is disabled
Customer Protocol connected	The activated customer Protocol is connected	Protocol is connected Protocol is disconnected
Customer Protocol reporting alarm	The activated customer Protocol has declared an alarm about result reporting of this Tightening unit.	Alarm is raised Alarm is cleared
Q_SAS	ACK start tightening job	-
RDY	System ready	-
Q_LSN	Reverse disabled	-
WGZ	Tool disabled	-
Q_EDZ	Result and reports reset	-
Q_XMS	XML data transfer completed	-
EIO	Result OK	-
ENO	Result NOK	-
FSCIO	Group status OK	-
FSCNIO	Group status NOK	-

2.8 - CVILOGIX

Name	Description	Raising condition Falling condition
External Out CVILOGIX bit (0..100)	Indicates that this output can be used by an internal CVILOGIX application	-

2.9 - Miscellaneous

Name	Description	Raising condition Falling condition
ON	On state, used to set level "1" to physical outputs.	At system startup. Never falls
OFF	Off state, used to set level "0" to physical outputs.	At system startup. Never falls

APPENDIX - USER INFOS CODES

1 - LIST OF USER INFOS RELATED TO THE SYSTEM

Type	Colour	Description	Action
Information	White	For information only.	No action is required.
Warning	Orange	The tool is locked.	Click the message to clear (acknowledge) the message and unlock the tool.
Error	Red	The tool is locked.	The issue has to be solved to unlock the tool and clear the error message.

Number	Description	Procedure
I001	Tubenut open	1- Tubenut tool is detected as open.
I002	Tool connected	1- The tool is connected and correctly recognized by the system.
I003	No tool connected	1- The tool has been disconnected. 2- If the tool is not physically disconnected, check the tool cable.
I015	Tool lock on reject	1- The tool is locked forward after a NOK. 2- Unlock the tool in function of the "lock on reject option" selection i.e. by reversing, loosening or input.
I016	Tool lock by Open Protocol	1- Tool has been locked by Open Protocol. 2- Unlock the tool by sending an "Enable tool" message via Open Protocol.
I017	Loosening prohibited	1- Loosening is prohibited. 2- The loosening is disabled in the Assembly action. 3- The batch count type OK + NOK is used.
I021	Maximum retries reached	1- The maximum number of retries has been reached. 2- The tool is locked. 3- The running Assembly Process has to be aborted.
I022	Lock wait socket	1- The tool is locked. Put all sockets back and lift the correct sockets combination.
I024	Loosening prohibited XML	1- Loosening is disabled by VWXML protocol.
I025	Tightening prohibited XML	1- Tightening is prohibited by VWXML protocol.
I040	Tool over speed	1- Motor speed exceeds 130% of its maximum value. 2- Check tool parameters (wrong motor tune parameters). 3- Contact your Desoutter representative for support.
I042	Tool locked by GeoPositioning system	1- Tool has been locked by GeoPositioning system. 2- Unlock the tool by moving the tool in its defined area.
I043	Tubenut maintenance	1- Tubenut settings need to be reconfigured. 2- Contact your Desoutter representative for procedure.
I044	GeoTracking/Positioning learning mode ongoing	1- GeoTracking/Positioning learning mode.
I049	Access denied	No procedure.
I050	Tool detection for pairing	No procedure.
I051	ePOD connected	ePOD connected.
I052	Incorrect network parameters	Incorrect network parameters
I053	No Tightening Unit available	No Tightening Unit available
I054	Pairing success	No procedure.
I055	eDOCK already present on system	No procedure.
I056	ePOD disconnected	ePOD disconnected
I057	Pairing error	No procedure.
I058	Tool locked by GeoTracking system	1- Tool has been locked by GeoTracking system. 2- Unlock the tool by moving the tool in its defined area.
I059	New tool detected	No procedure.

Number	Description	Procedure
I060	Tool synchro ongoing	No procedure.
I061	ExBC connection conflict	1- Two ExBC are configured with the same network settings. 2- Verify communication ports and IP addresses.
I100	Cable ID invalid parameter	1- Invalid tool cable parameter. 2- Check that the tool cable is Desoutter certified. 3- Contact your Desoutter representative for support.
I101	Cable ID not detected	1- Tool cable communication error. 2- Check that the tool cable is Desoutter certified. 3- Contact your Desoutter representative for support.
I102	Cable ID not certified	1- Tool cable authentication error. 2- Check that the tool cable is Desoutter certified. 3- Contact your Desoutter representative for support.
I199	Console activated	1- The serial console is activated. 2- Warning: this console is dedicated to debug purposes only and should not be used in production.
I202	Fieldbus lost	1- Fieldbus connection with PLC is lost. - no heartbeat is received from PLC. - the cable is broken or disconnected. - the PLC is offline or not powered. 2- Check the Fieldbus configuration.
I204	Tool not validated	1- Tool locked by I/O. 2- Check I/O settings: "Tool validation" must be active to unlock the tool.
I207	Assembly done	1- Assembly Process is done, the tool is locked. 2- Select a new Assembly Process to unlock the tool.
I208	Invalid run reverse parameter	1- Invalid Run Reverse setting: torque or speed are greater than tool characteristics or loosening strategy is not supported. 2- Check Pset settings with the current tool characteristics. 3- Reduce the maximum number of turns.
I209	Pset invalid parameters	1 - Software internal error. 2 - Pset is corrupted. Try to transfer it again to the system. 3 - If the error persists, contact your Desoutter representative for support.
I215	Current calibration error	1- Current calibration failed. 2- Try once again. 3- If the problem occurs again, contact your Desoutter representative for support.
I225	Error angle	1- Tool communication error. 2- Check tool and cable connections. 3- If the problem occurs again, contact your Desoutter representative for support.
I226	Error torque	1- Tool communication error. Check tool and cable connections. 2- Try once again. 3- If the problem occurs again, contact your Desoutter representative for support.
I234	Fieldbus mismatch	1-The Fieldbus module declared in configuration is not the same than the module connected to the system.
I237	Invalid data	1- The Fieldbus mapping has too many items.
I238	Invalid address	1- The device address affected to Fieldbus is invalid.
I239	Invalid communication settings	1- Fieldbus communication settings are invalid.
I241	CVINET FIFO alarm	1- CVINET FIFO has reached the alarm threshold, the connection is lost. 2- Check the Ethernet cable. 3- Check the Ethernet configuration. 4- Check that CVINET is running correctly.
I242	ToolsNet FIFO alarm	1- ToolsNet FIFO has reached the alarm threshold, the connection is lost. 2- Check the Ethernet cable. 3- Check the Ethernet configuration. 4- Check that ToolsNet is running correctly.

Number	Description	Procedure
I244	Accessory disconnected	1- The accessory at the given address has been disconnected from the eBUS of the system. 2- Check the accessory cable.
I245	Wait report acknowledge	1- Acknowledge report with its corresponding input.
I254	Drive communication error	1- Error detected in drive communication. 2- Restart the system. 3- If the problem occurs again, contact your Desoutter representative for support.
I259	Reset input active	1- "Reset" input is active. 2- The tightening unit will unlock when input switches to "Inactive".
I261	Locked by IPM	1- IPM protocol has locked the system. 2- Check the connection with the IPM gateway. 3- Check the IPM configuration in the system.
I262	Open Protocol connection lost	1- Open Protocol connection has been lost.
I263	Socket tray conflict	1- For this tightening unit, do not associate more than one socket combination to a Pset.
I264	Too many steps	1- Connect an ePOD3 to the system to enable more steps per Pset.
I266	Message:	Incoming message received with dynamic text.
I269	Pset modified	No procedure.
I271	External tool Pset selected	1- Tool is locked because of "External tool Pset" selection.
I275	Invalid eCompass Pset	1- Check tool is compatible with gyroscope (eCompass). 2- Else use a tool compatible with gyroscope. 3- Else edit your Pset to remove gyroscope settings.
I310	Identifier OK:	1- An identifier has been received and accepted. 2- The identifier is matching an Assembly Process start condition.
I311	Identifier NOK:	1- An identifier has been received. 2- The identifier does not match any Assembly Process start condition.
I312	Access expired	1- The access rights on the USB key cannot be read. 2- Unplug the key and insert it again. 3- If the issue is persistent, the access right file is probably corrupt. 4- Contact your "CVI Key" administrator.
I313	Access invalid	1- The access rights on the USB key cannot be read. 2- Unplug the key and insert it again. 3- If the issue is persistent, the access right file is probably corrupt. 4- Contact your "CVI Key" administrator.
I314	CVIKey plugged	No procedure.
I315	CVIKey unplugged	No procedure.
I316	Barcode lost	No procedure.
I400	Default network configuration	1- Network configuration has been set to default.
I401	Network configuration error	1- Network configuration failed. 2- Check your settings. 3- If the problem occurs again, contact your Desoutter representative for support.
I500	CVILOGIX user info	Message generated by CVILOGIX program.
I503	CVILOGIX	1- Tool has been locked by CVILOGIX. 2- Check the CVILOGIX program status. 3- Check an ePOD is plugged to the system.
I700	eWallet plugged	eWallet plugged
I701	eWallet unplugged	1- eWallet unplugged. 2- Try unplugging the key and insert it again. 3- If the problem occurs again, contact your Desoutter representative for support.
I702	RIM unplugged	RIM unplugged
I703	RIM unplugged	RIM unplugged
I888	System software updated	No procedure.

Number	Description	Procedure
I889	Device software updated	No procedure.
I891	System started	No procedure.
I899	Downgrade not allowed	1- Software downgrade is not allowed for this version. 2- Check the software image version on your USB key. 3- If the problem occurs again, contact your Desoutter representative for support.
I900	Software update failed	1- Software upgrade failed. 2- Do not remove the USB key and restart the system. 3- If the problem occurs again, contact your Desoutter representative for support.
I901	Software not found	1- The software upgrade failed: software image invalid. 2- Check your USB key: it must have only one image at the root directory.
I902	Software invalid	1- The software upgrade failed: software image invalid. 2- Remove and copy again your software image. 3- Try another USB key. 4- Contact your Desoutter representative for more information.
I903	Software updater missing	1- The software updater is not available or damaged. 2- Contact your Desoutter representative for more information.
I904	Backup disabled	1- The "Save parameters" utility is not available. 2- Contact your Desoutter representative for more information.
I905	USB key full	1- Your USB key is full, all data were not saved. 2- Delete your old backup files and try again.
I906	Save parameters failed	1- An error occurred during backup: data were not saved. 2- Check the available space on your key, delete files and try again. 3- If the problem occurs again, contact your Desoutter representative for support.
I907	Wrong USB port	1- Your USB device is plugged to the wrong port. 2- If your device is a USB key, plug it to the USB front port. 3- If your device is a USB barcode reader or keyboard, plug it to the bottom USB ports.
I908	Too HID device	1- Too many USB devices (barcode reader or keyboard) are plugged to the system. 2- Remove all devices and plug them again to the bottom USB ports only.
I909	HID device error	1- Your USB device is not supported by the system. 2- Only USB barcode reader and USB keyboard are supported. 3- If the problem occurs again, contact your Desoutter representative for support.
I910	Save program error	1- Plug an USB key to the front panel. 2- Check available space on your USB key, delete some old backup and try again.
I911	Load program error	1- Plug an USB key to the front panel. 2- The .zip file was not found: check that it is in the correct directory.
I912	Backup failed	1- Check the ePOD connection. 2- Contact your Desoutter representative for support.
I913	Restore failed	1- Check the ePOD connection. 2- Contact your Desoutter representative for support.
I914	Maintenance ongoing.	Maintenance ongoing.
I917	Accessory configuration error	1- The accessory configuration is not correct. 2- Check type of elements and events associated.
I920	System reset	ePOD automatic backup must be configured again.
I921	Pset execution not authorized	1- Check used features allowance. 2- Contact your Desoutter representative for support.

Number	Description	Procedure
I923	Additional transducer offset failure	<ol style="list-style-type: none"> 1- Offset value from additional torque sensor is outside bounds. 2- Restart the tool with no mechanical constraints. 3- If the problem occurs again, contact your Desoutter representative for support.
I924	Tool calibration required	<ol style="list-style-type: none"> 1- Perform a calibration of the tool.
W041	Unauthorized tool	<ol style="list-style-type: none"> 1- The tool connected to the system is not authorized. 2- Maximum number of battery tools reached or tightening unit associated does not exist anymore. 3- Check the ePOD/RIM connection and capacity.
W201	Replace RTC battery.	<ol style="list-style-type: none"> 1- The "Real Time Clock" backup battery needs to be replaced.
W214	Short circuit	<ol style="list-style-type: none"> 1- Serial peripheral default. 2- Disconnect and reconnect. 3- Check the serial peripheral.
W219	Trig. safety failure	<ol style="list-style-type: none"> 1- Drive hardware failure. 2- Safety issue. 3- Contact your Desoutter representative for support.
W220	Hardware trip	<ol style="list-style-type: none"> 1- Drive hardware failure. 2- Safety issue. 3- Contact your Desoutter representative for support.
W229	Drive PWM error	<ol style="list-style-type: none"> 1- Software failure. 2- Restart the system. 3- If the problem occurs again, contact your Desoutter representative for support.
W246	Synchro I/O problem	<ol style="list-style-type: none"> 1- Error detected on synchronisation input. 2- Check the configuration of I/O. 3- Check the synchronisation cable.
W250	Pset corrupted	<ol style="list-style-type: none"> 1- Pset is not defined correctly. 2- Check the Pset.
W253	Incorrect tool Id	<ol style="list-style-type: none"> 1- Pset is not defined correctly. 2- One tool declared in the Pset is not part of the tightening unit. 3- Check the Pset.
W257	Remote start error	<ol style="list-style-type: none"> 1- Verify the tool trigger is correctly pushed.
W258	Calibration need Pset mode	<ol style="list-style-type: none"> 1- For tool calibration, the tightening unit has to be in "Pset" mode. 2- Change the tightening unit mode into "Pset" mode.
W276	Database error	<ol style="list-style-type: none"> 1- It was not possible to access the database. 2- Try to clear the database. 3- If problem persists, contact your Desoutter representative for support.
W726	Desoutter Protocol: demo mode expired	<ol style="list-style-type: none"> 1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
W727	Desoutter MIDs not authorized	<ol style="list-style-type: none"> 1 - This feature is configured but not active. 2 - To activate it with UV, go to the "Feature management" menu.
W735	Ford Protocol: demo mode expired	<ol style="list-style-type: none"> 1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
W736	Ford Protocol not active	<ol style="list-style-type: none"> 1 - This feature is configured but not active. 2 - To activate it with UV, go to the "Feature management" menu.
W741	CVILOGIX: demo mode expired	<ol style="list-style-type: none"> 1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
W742	CVILOGIX not active	<ol style="list-style-type: none"> 1 - This feature is configured but not active. 2 - To activate it with UV, go to the "Feature management" menu.

Number	Description	Procedure
W743	Up to 50 Pset: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
W744	Up to 250 Pset: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
W745	Up to 50 AP: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
W746	Up to 250 AP: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
W501	CVILOGIX user info	Message generated by CVILOGIX program.
W600	System disconnected	1- The system is disconnected. 2- Check the network cable.
W601	Result not OK	Result not OK.
W925	RIM update in progress	1-Wait until the RIM update is finished.
W926	Inconsistencies RIM information	1- Perform a firmware upgrade to fix the information in the RIM.
E006	Rotor locked	1- Replace the tool. 2- The damaged tool needs maintenance.
E013	Bad tool ground	1- Phase-phase or phase to ground short-circuit. 2- Disconnect the tool. Contact your Desoutter representative for support.
E014	Torque power default	1- The torque sensor is not correctly supplied. 2- The tool needs maintenance. If the problem occurs again, contact your Desoutter representative for support.
E019	Tool communication error	1- Tool communication error. 2- Check tool and cable connections. If the problem occurs again, contact your Desoutter representative for support.
E020	Tool LED error	1- Tool LEDs are not correctly supplied. 2- Disconnect and reconnect the tool. If the problem occurs again, contact your Desoutter representative for support.
E023	Unsupported tool	1- The tool connected to the system is not supported. 2- Contact your Desoutter representative for support.
E200	Quick stop !	1- The quick stop has been activated. 2- Check the Phoenix connector.
E213	Drive connection lost	1- Connection with the drive has been lost. 2- Reboot the system. 3- If the issue remains, contact your Desoutter representative for support.
E217	Drive disabled	1- Drive disabled by external source. 2- Contact your Desoutter representative for support.
E218	Drive power failure	1- Drive hardware failure. 2- Safety issue. Contact your Desoutter representative for support.
E221	Drive check error	1- Drive hardware failure. 2- Safety issue. Contact your Desoutter representative for support.
E222	System too hot	1- Heatsink too warm. 2- Let the system cool down.
E230	DC bus high	1- Maximum current exceeded. DC-bus voltage high. 2- Contact your Desoutter representative for support.
E231	DC bus too low	1- Power failure. DC-bus voltage low. 2- Contact your Desoutter representative for support.
E232	Error ID Fieldbus	1- The Fieldbus module plugged to the system is not an authorized Desoutter module. 2- Contact your Desoutter representative for more information.

Number	Description	Procedure
E233	CVINET FIFO full	<ol style="list-style-type: none"> 1- CVINET FIFO is full, the connection has been lost. 2- Check the Ethernet cable. 3- Check the Ethernet configuration. 4- Check that CVINET is running correctly.
E236	ToolsNet FIFO full	<ol style="list-style-type: none"> 1- ToolsNet FIFO is full, the connection has been lost. 2- Check the Ethernet cable. 3- Check the Ethernet configuration. 4- Check that ToolsNet is running correctly.
E240	XML not authorized	<ol style="list-style-type: none"> 1- The selected XML protocol is not authorized. 2- Check the ePOD characteristics.
E243	PFCS not authorized	<ol style="list-style-type: none"> 1- The selected PFCS protocol is not authorized. 2- Check the ePOD characteristics.
E247	XML version conflict	<ol style="list-style-type: none"> 1- Conflict detected in Audi / VW XML protocol version. 2- Check the coherence of the version between the system and master PC/PLC.
E248	SAS order failed	<ol style="list-style-type: none"> 1- Fieldbus SAS order has failed. 2- Check the value of RRGI, SIO, etc.
E249	XML PRG 0	<ol style="list-style-type: none"> 1- The PRG value 0 has been set by Fieldbus.
E255	Drive choke too hot	<ol style="list-style-type: none"> 1- Power electronics too warm. 2- Let the system cool down.
E256	Motor too hot	<ol style="list-style-type: none"> 1- Tool is locked because the maximum motor temperature has been reached. 2- Tool will remain locked until the motor temperature comes back to its normal value.
E260	IPM not authorized	<ol style="list-style-type: none"> 1- The selected IPM protocol is not authorized. 2- Check the ePOD characteristics.
E265	Socket(s) usable with more than one tightening unit	<ol style="list-style-type: none"> 1- Reconfigure sockets combination to resolve conflicts.
E268	CVINET incompatible	<ol style="list-style-type: none"> 1- Update CVINET WEB software.
E277	Half DC bus voltage out of range	<ol style="list-style-type: none"> 1- Half DC-bus voltage is out of range. 2- Switch off the system. Wait at least 30 seconds. Switch on the system and try again. 3- If the problem occurs again, change the drive and try again. 4- Contact your Desoutter representative for support.
E278	Pre-loaded BUS capacitors failure	<ol style="list-style-type: none"> 1- Bus capacitors are not correctly pre-loaded. 2- Switch off the system. Wait at least 30 seconds. Switch on the system. 3- If the problem occurs again, change the drive and try again. 4- Contact your Desoutter representative for support.
E280	Result not stored	<ol style="list-style-type: none"> 1- It was not possible to persist the tightening result on ePOD. 2- Switch off the system. Wait at least 30 seconds. Switch on the system. 3- Contact your Desoutter representative for support.
E502	CVILOGIX user info	Message generated by CVILOGIX program.
E704	Missing UV	<ol style="list-style-type: none"> 1- The UV amount of the configuration is greater than the number of UVs available in the RIM. 2- Allocate UVs to this RIM. 3- Contact your Desoutter representative for more information.
E705	Missing demo UV	<ol style="list-style-type: none"> 1- The demo UV amount of the configuration is greater than the number of demo UVs available in the RIM. 2- Allocate demo UVs to this RIM. 3- Contact your Desoutter representative for more information.
E706	Missing UV/demo UV	<ol style="list-style-type: none"> 1- The demo UV amount of the configuration is greater than the number of demo UVs available in the RIM. 2- Allocate demo UVs to this RIM. 3- Contact your Desoutter representative for more information.

Number	Description	Procedure
E711	Tightening Unit: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E712	Tightening Unit not active	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.
E717	Up to 50 Pset: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E718	Up to 250 Pset: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E719	Up to 50 AP: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E720	Up to 250 AP: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E721	Up to 50 Pset: not active	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.
E722	Up to 250 Pset: not active	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.
E723	Up to 50 AP: not active	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.
E724	Up to 250 AP: not active	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.
E729	PFCS: demo expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E730	PFCS not active	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.
E732	VWXML: demo expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E733	VWXML not active	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.
E738	IPM: demo expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E739	IPM not active	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.
E890	Device Software Error	-
E915	Inconsistent version	1- Firmware version of all systems must be identical. 2- Update the systems firmware.
E916	Workgroup not authorized	1- Connect an ePOD3 to the primary system.
E918	Emergency stop !	1- The emergency stop has been activated. 2- Check the M8 connector.
E919	Additional transducer error	1- The additional transducer maximum torque is lower than the embedded transducer maximum torque. 2- The Pset uses an additional transducer not installed on the tool.
E927	Corrupted RIM information	1- It is not possible to use this RIM. 2- Contact your Desoutter representative for support.
E928	Tracking System communication failed	1- Tracking System communication failed.

Number	Description	Procedure
E935	1 Working Space: demo expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E936	1 Working Space: not authorized	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.
E941	E-Lit WI-FI: demo mode expired	1 - The demo period for this feature was 90 days. 2 - This demo period is now elapsed. 3 - To continue to use it you need to activate it with UV.
E942	E-Lit WI-FI: not authorized	1 - This feature is configured but not active. 2 - To activate it with UV, go to the "feature management" menu.

2 - LIST OF USER INFOS RELATED TO THE TOOLS

Type	Colour	Description	Action
Information	White	For information only.	No action is required.
Warning	Orange	The tool is locked.	Click the message to clear (acknowledge) the message and unlock the tool.
Error	Red	The tool is locked.	The issue has to be solved to unlock the tool and clear the error message.

Number	Description	Procedure
I004	Span failure	1- Span value from torque sensor is outside bounds. 2- Try once again to start the tool with no mechanical constraints. If the problem occurs again, contact your Desoutter representative for support.
I005	Offset failure	1- Offset value from torque sensor is outside bounds. 2- Try once again to start the tool with no mechanical constraints. If the problem occurs again, contact your Desoutter representative for support.
I026	Tool maintenance alarm n1	1- The tool tightening counter has been reached.
I027	Tool maintenance alarm n2	1- The tool tightening counter has been reached.
I038	Tool logs	1- Unexpected tool software exception. 2- Log file has been generated by the tool. 3- Contact your Desoutter representative for support.
I046	Abnormal battery current	1- Abnormal battery current consumption. Check the Pset settings. 2- This error can be due to wrong speed settings.
I063	Battery pack removed	1- Battery pack removed from the tool detected. 2- After few seconds, the tool will shutdown
I065	External start ignored	1- External start detected but ignored. 2- Check tool and external start configuration.
I103	Invalid rotary selector direction	1- Change the direction of the rotary selector. 2- Verify that the rotary selector is in correct position or not damaged.
I205	Torque settings	1- Invalid Torque setting: torque is greater than tool characteristics. 2- Check Pset settings with the tool characteristics.
I206	Speed settings	1- Invalid speed setting: speed is greater than tool characteristics. 2- Check Pset settings with the tool maximum speed.
I210	Invalid Pset selected	1- The selected Pset does not match the Pset selectable in the Assembly Process.

Number	Description	Procedure
I211	Invalid trigger configuration	1- The tool connected to the system is not equipped with the trigger required by the trigger configuration. 2- Adjust your trigger configuration to the tool or change the tool according to the trigger configuration.
I224	IGBT too hot	1- Power electronics too warm. 2- Let the system cool down.
I251	No Pset selected	1- No Pset selected. 2- Select a Pset.
I270	Time settings	1-Invalid Time setting 2-Check Pset settings with correct time value settings
W010	Tool calibration expired	1- The tool calibration date has expired. 2- A tool calibration needs to be done to ensure the measurement accuracy.
W028	Battery tool version error	1 - Battery tool version and system version are not compatible.
W030	The battery is low.	1- The battery is low. 2- Recharge the battery.
W033	Tool time error	1- The tool time is not set correctly. The tightening results will not be time stamped. 2- Connect the tool to the system to set date and time.
W036	Tool memory full	1- The tool memory is full. 2- Connect the tool to the system to empty the memory.
W062	Overload of torque	1- Overload of the torque (could be a rehit). 2- Check the tool cable is not damaged.
W212	Result not stored	1- It is not possible to store the tightening result in the system. 2- Contact your Desoutter representative for support.
W216	Current high	1- Maximum current exceeded. 2- Contact your Desoutter representative for support.
W267	Result transfer error	Result transfer error.
E007	Motor too hot	1- Tool is locked because the maximum motor temperature has been reached. 2- Tool will remain locked until the motor temperature comes back to its normal value.
E008	Tool angle fault	1- Problem detected with the tool angle sensor. 2- The tool needs maintenance.
E009	Tool invalid parameters	1- Check the tool compatibility. 2- The tool memory cannot be read or is invalid. 3- The tool needs maintenance. If the problem occurs again, contact your Desoutter representative for support.
E012	Tool EEPROM error	1- The tool memory cannot be read or is invalid. 2- The tool needs maintenance. If the problem occurs again, contact your Desoutter representative for support.
E018	Torque out of range !	1- The target torque value is above the tool maximum torque. 2- Check Pset settings with tool characteristics.
E029	The battery is empty.	1- The battery back is discharged. The tool cannot tighten. 2- Recharge the battery pack.
E031	Battery error	1- Abnormal battery voltage. The tool cannot tighten. 2- Recharge the battery pack. If the problem occurs again, replace the battery pack.
E032	Tool display error	1- Board display malfunction. 2- Contact your Desoutter representative for support.
E034	Tool memory error	1- The tool memory does not work properly. 2- Contact your Desoutter representative for support.
E035	Tool memory locked	1- The tool memory is locked to protect old data from rewriting. 2- Connect the tool to the computer via eDOCK to retrieve old data.
E037	Tool trigger error	1- The tool trigger does not work properly. 2- Check and clean the trigger. If the problem occurs again, contact your Desoutter representative for support.

Number	Description	Procedure
E045	Abnormal battery voltage	<ol style="list-style-type: none"> 1- Check the battery pack. 2- This error can be due to charger malfunction or end of life battery.
E047	Battery is too low.	<ol style="list-style-type: none"> 1- Check the battery pack. 2- If the problem occurs again, replace the battery pack.
E048	Battery type not allowed	<ol style="list-style-type: none"> 1- Battery type not allowed. 2- Replace the battery pack or your configuration.
E223	Drive init error	<ol style="list-style-type: none"> 1- Software failure. 2- Restart the system. 3- If the problem occurs again, contact your Desoutter representative for support.
E227	Motor stalled	<ol style="list-style-type: none"> 1- Motor stalled (could be missing phase, wrong motor tune or power electronics failure) 2- Try once again. 3- If the problem occurs again, contact your Desoutter representative for support.
E228	Drive error	<ol style="list-style-type: none"> 1- Software failure. 2- Restart the system. 3- If the problem occurs again, contact your Desoutter representative for support.

More Than Productivity