

DSC FIELDBUS MODULES

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INTRODUCTION

This technical sheet describes the operation of the fieldbus modules of the DSC series: MBP (PROFIBUS DP-V1); MBD (DeviceNet); MBC (CANOpen); MBEC (ETHERCAT); MBEI (ETHERNET/IP); MBEI2B (ETHERNET/IP-2 PORT); MBEP (PROFINET); MBEP2 (PROFINET I/O - 2 PORT); MBEM (Modbus TCP); MBMR (Modbus RTU); MBU (USB).

ELECTRICAL CONNECTIONS

Each module is provided with four connectors:

- 1) 5 way connector MSC --> to the system DSC
- 2) USB miniB connect --> to the PC
- 3) BUS connector --> to the fieldbus (not present on MBU)
- 4) Front terminal --> power supply

TERMINAL BLOCK (SIDE A - TOP)	
TERMINAL	SIGNAL
1	+24VDC \pm 20%
2	-
3	-
4	GND

Table 1

- Install safety units in an enclosure with a protection class of at least IP54.
- The supply voltage to the units must be 24Vdc \pm 20% (PELV, in compliance with the standard EN 60204-1).
- Do not use DSC to supply external devices.
- The same ground connection (0VDC) must be used for all system components.

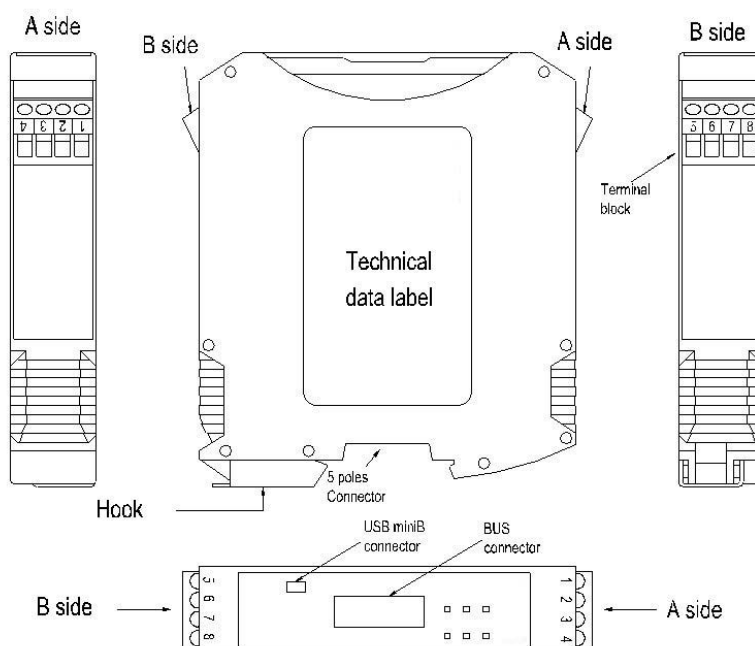


Figure 1

PROTOCOL DATA PACKAGE COMPOSITION

The bus module exports the system status and the status and diagnostic elements of all I/Os configured on the DSC and enables 8 single fieldbus inputs to be imported.

The input and output memory maps are described in the tables at page 3.

The input map is made up by a single byte representing the fieldbus inputs.

The output map is made up by a status byte, a variable number of bytes for the DSC input status, a byte representing the copy of the fieldbus inputs, a variable number of bytes to represent the probes status, a variable number of bytes to represent the DSC OSSD status, two bytes to represent the DSC diagnostics.

The system status is shown as one byte in which the bit 0 indicates whether the DSC is online/offline and bit 1 indicates the presence of diagnostic elements.

Each input and each output (OSSD) configured on the DSC system is associated with two information elements: *status* and *diagnostic*.

Status is a binary value, 0 or 1; diagnostic is a code indicating the condition of the I/O, and indicates a problem on the I/O.

Each module with inputs has a number of bits corresponding to the number of physical inputs that are present; thus modules M1, MI8, MI8O2 are associated with 1 byte (8 bit) and module MI16, MI12T8 with 2 bytes (16 bit) for the inputs status.

All *safety outputs are summarized in 1 or 2 bytes*.

The inputs location varies according to the type of modules that are installed, in the following order: **M1, MI8O2, MI16, MI8, and MI12T8**. If several modules of the same type are installed the order follows the node number.

The byte that represents the state of the inputs fieldbus input from the PLC is taken over from PLC to allow feedback to the PLC program. The status of the probe is represented with 2 bytes.

The safety outputs are represented with 1 or 2 bytes.

Diagnostic elements are in the form of 2 bytes which indicate the number of the I/O with the problem and the value of the diagnostic element. If there is more than one diagnostic element, the relative values alternate every 500ms.

Each set of information:

- input status,
- input diagnostics,
- fieldbus input status,
- probe status,
- safety output status,
- safety output diagnostics

can be enabled/disabled in order to control the information and thus the number of bytes exported to the fieldbus.

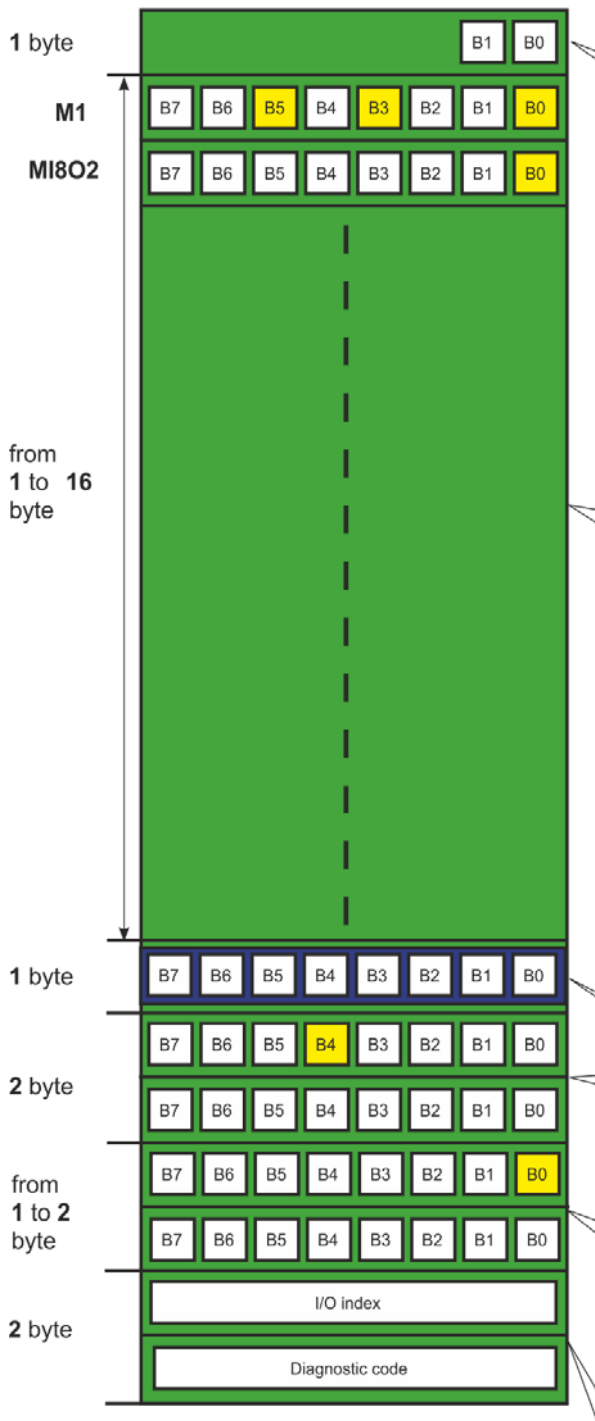
- The definition of the footprint in the input and output is shown from the point of view of the DSC. (Output PLC).
- For the fieldbuses in which the mapping position is mandatory (i.e. PROFIBUS) the input byte must be mapped before the output bytes.

Footprint in input



Fieldbus input

Footprint in output



System status (1 byte)
 B0=0: DSC offline
 B0=1: DSC online
 B1=0: No diagnostic present (diagnostic OK)
 B1=1: Diagnostic present

Input status (1 to 16 bytes)
 Every module with physical inputs will use the correspondent number of bits:
 • modules M1, MI8, MI8O2, MV0, MV1 and MV2 will use 1 byte
 • modules MI16 and MI12T8 will use 2 bytes
 The position of the bytes in the subsection follows the order: M1 – MI8O2 – MI16 – MI8 – MI12T8 – MV2 – MV1 – MV0. If two modules of the same type are present in the system the order will follow the node number.
 In the example the **1st byte – Module M1**:
 • bit 0 is used for the ESPE functional block status. In the schematic this block uses 3 physical inputs so it occupies 3 bits (0, 1 and 2)
 • bit 3 is used for the E-STOP functional block. It uses 2 physical inputs so it occupies 2 bits (3 and 4)
 • bit 5 is used for the functional block E-GATE. It uses 2 physical inputs so it occupies 2 bits (5 and 6)
 • bit 7 is free
 The **2nd byte – Module MI8O2**:
 • bit 0 is used for the E-GATE functional block. It uses 2 physical inputs so it occupies 2 bits (0 and 1)

Inbound footprint feedback (1 byte)
 This is the copy of the inbound footprint used for feedback to the PLC

Probe status (2 bytes)
 Each bit is used for the status of the probe(s) in the MSD schematic. In the example the probe is assigned to bit 4. A maximum of 16 probes can be used.

OSSD status (1 or 2 bytes)
 Each bit is used for the OSSD status. The position of bits follow the order: M1 – MI8O2 – MO2 – MO4 – MOR4 – MOR4S8. In the example there is only the OSSD1 mapped on bit 0.

Diagnostic (2 bytes)
 Every input or OSSD functional block has a diagnostic code associated to it.
 The system will export on the fieldbus 2 bytes:
 • the I/O index
 • the diagnostic code of the I/O

NOTE: I/O indexes and diagnostic codes are referred in the manual Mosaic Fieldbus module.
 When the I/O is in a OK status the I/O index byte value is zero and the Diagnostic code value is 0x80 (Diagnostic OK).

➔ If the DSC system includes a fieldbus module, the DSDesigner report will include a table with the I/O index for all the inputs, fieldbus input, probe and safety outputs in the electric circuit.

The subsections **Input status** and **OSSD status** size depends on which modules are in the DSC system. By adding modules with physical inputs or with OSSDs the size of each subsection will grow accordingly.

For example, a DSC system **with an M1** (8 inputs and 2 OSSDs) has:

- the subsection Input status size is 1 byte in which the 8 bits are used for the 8 physical inputs;
- the subsection OSSD status size is 1 byte in which the first 2 bits are used for the OSSD status.

By adding an **M1802** module:

- the subsection Input status size will grow to 2 bytes;
- the subsection OSSD status size will stay at 1 byte, but the number of used bits will grow to 4.

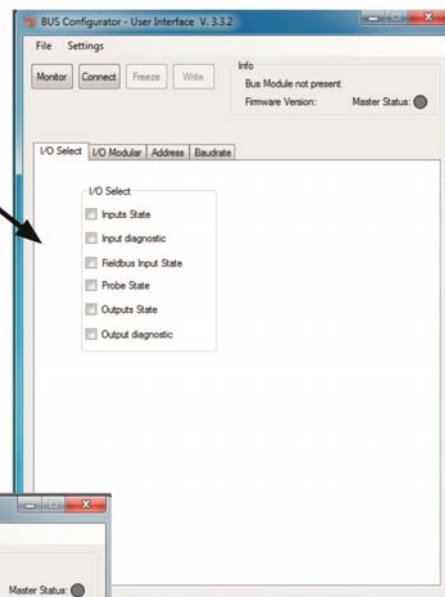
The maximum number of physical inputs in a DSC system is 128 so the maximum size of the Input status subsection is 16 bytes (128/8).

The maximum number of OSSDs in a DSC system is 16 so the maximum size of the OSSD status subsection is 2 bytes (16/8).

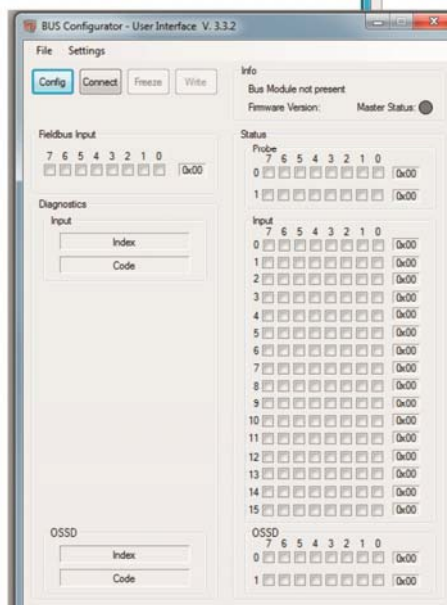
Footprint configuration

The inbound footprint and the outbound footprint can be configured using the **Bus configurator – User interface software**.

Whit this software the user can choose which subsection must be exported in the filedbus, changing the size of each footprint and the size of the PLC physical memory.



The **Monitor** button allows the user to see a graphical presentation of the footprint and the value of each byte in it.



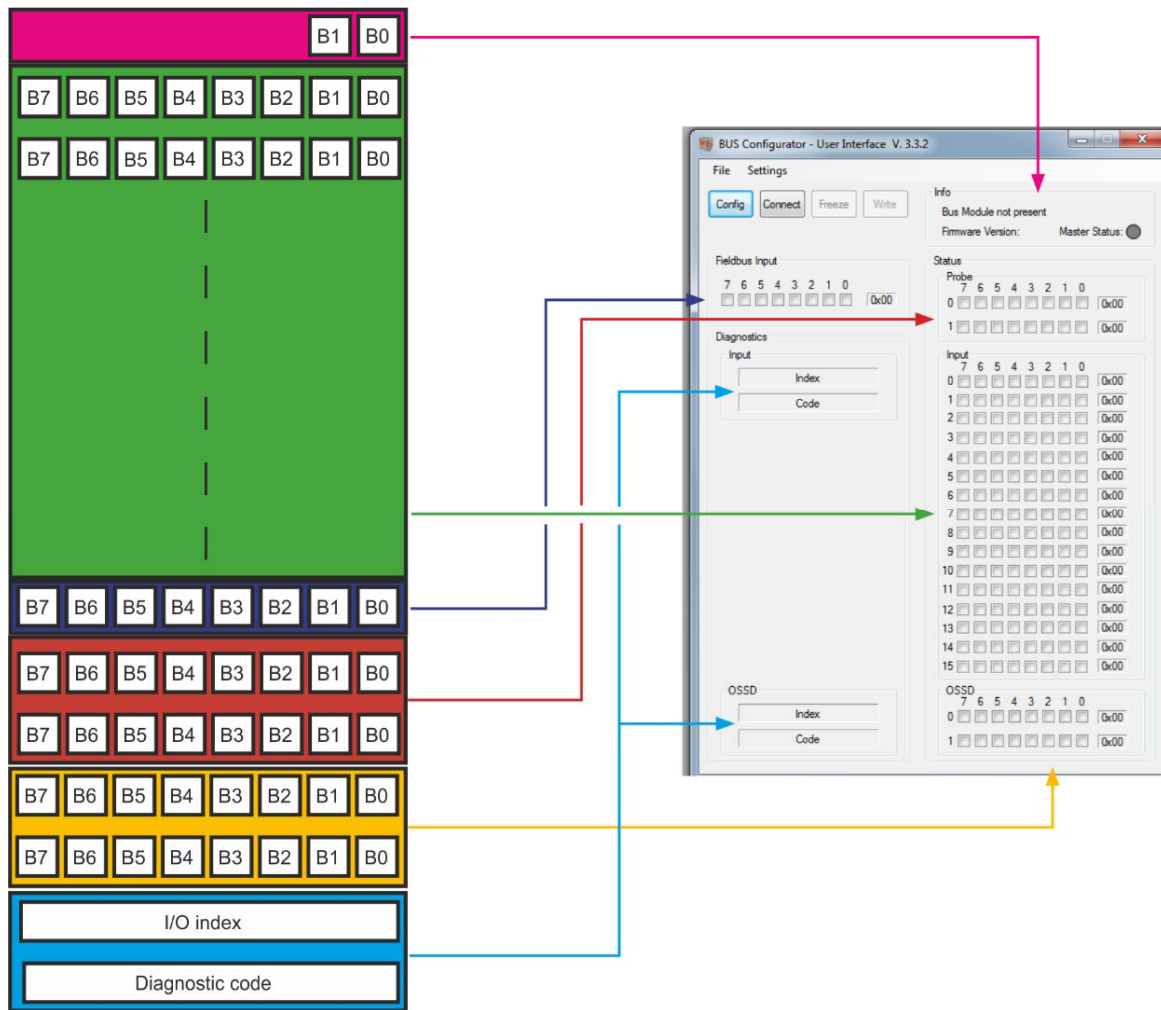


Figure 1 – Footprint on bus configurator

MV MODULES INPUT STATUS (page 4)

All status occupy 4 bits: 0 to 3 or 4 to 7 in the "State Inputs" Footprint in the Output. The content of the bits is given below.

(Verify on instruction manual of the DSD software the meaning of the conditions specified in the table; sect. SPEED CONTROL FUNCTION BLOCKS).

STAND STILL			
Encoder / Encoder + proxy		Proxy	
Code	Meaning	Code	Meaning
0	>standstill + CCW	0	>standstill
2	>standstill + CW	3	<standstill
3	<standstill + CCW		
5	<standstill + CW		

WINDOW SPEED CONTROL			
Encoder / Encoder + proxy		Proxy	
Code	Meaning	Code	Meaning
0	out of window + CCW	0	out of window
1	in window + CCW	1	in window
2	out of window + CW		
3	in window + CW		

SPEED CONTROL			
Encoder / Encoder + proxy		Proxy	
Code	Meaning	Code	Meaning
0	>overspeed + CCW	0	>overspeed
1	<overspeed + CCW	1	<overspeed
2	>overspeed + CW		
3	<overspeed + CW		

STAND STILL AND SPEED CONTROL			
Encoder / Encoder + proxy		Proxy	
Code	Meaning	Code	Meaning
0	>standstill >overspeed + CCW	0	>standstill >overspeed
1	>standstill >overspeed + CCW	1	>standstill <overspeed
2	>standstill >overspeed + CW	4	<standstill <overspeed
3	>standstill <overspeed + CW		
4	<standstill <overspeed + CCW		
6	<standstill <overspeed + CW		

DIAGNOSTICS

Each input and each safety output is associated with a relative diagnostic code. When the I/O is connected correctly, the diagnostic code is OK and is not exported to the fieldbus; if there is a problem on the I/O, the system exports 2 bytes to the fieldbus with:

- the index of the I/O in question
- the relative diagnostic code

The "I/O index" field

This field indicates the number used to identify the I/O with a diagnostic code other than OK. Possible values for this field are shown in Table 2.

TYPE OF SIGNAL	I/O INDEX
Input	1-128
Output	192-255

Table 2

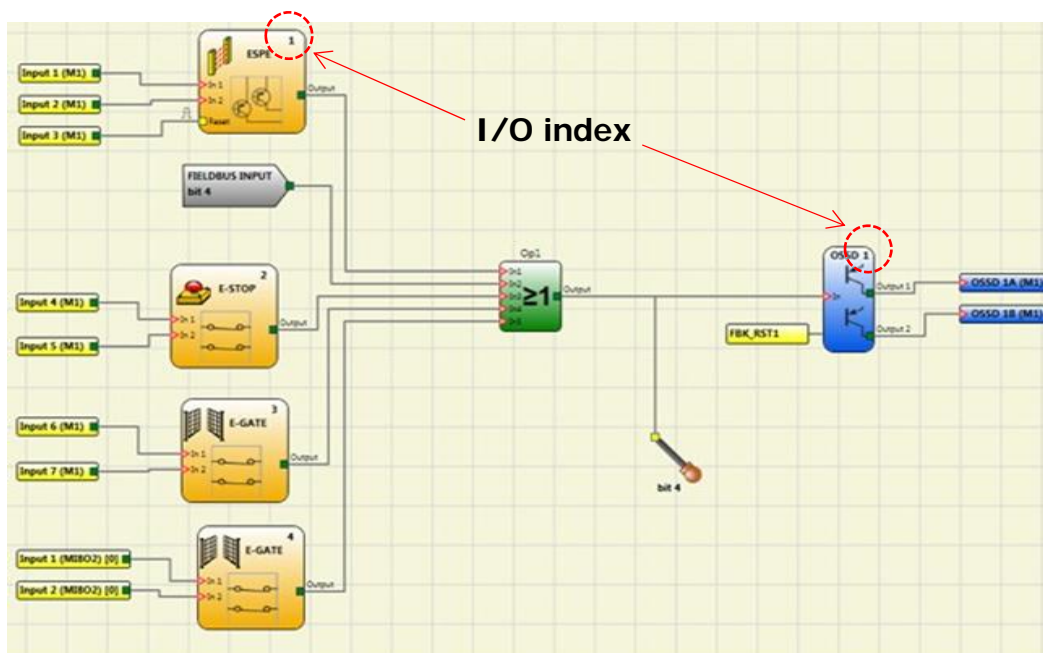


Figure 2- Index of I/O

The "Diagnostic code" field

The "Diagnostic code" field indicates the diagnostics for the I/O. Possible values for this field are shown in Tables 4, 5 and 6.

Input diagnostics		
128 (0x80)	Input diagnostics OK	-
1	Not moved from zero	Both switches have to go to rest condition
2	Concurrent failed	Both switches have to change state simultaneously
3	Concurrent failed hand1	Wrong connection on one side of a two-hands switch
4	Concurrent failed hand2	Wrong connection on one side of a two-hands switch
7	Switch inconsistent	The selector should not have more than one input set
8	Switch disconnected	The selector should have at least one input set
10	OUT_TEST error	OUT_TEST diagnostics present on this input
11	Second input KO	Redundancy check failed on input
12	OUT_TEST diagnostics OK	
13	Output connected to other inputs	Test output not connected to the right input
14	Output OK but input connected to 24VDC	Stucked input
15	Short circuit between photocell test and photocell input	Photocell response time too low
16	No response from photocell	The test signal on the photocell emitter is not seen on the receiver
17	Short circuit between photocells	The test signal is present on two different photocells
18	MAT disconnected	Wrong mat connection
19	Output inconsistent with feedback	The test signal on input is present on more than one OUT_TEST
20	Connection incorrect	The test signal is present on more than one input
21	Output stuck	The test signal on the input is not present on the OUT_TEST
22	Second OUT_TEST KO	Redundancy check failed on OUT_TEST
23	MV2 proximity missing.	Proximity does not present / Proxy not working
24	MV2 encoder missing.	This encoder / Encoder unpowered
25	MV2 encoder Proximity missing.	Device connected incorrectly
26	MV2 Proximity1, Proximity2 missing.	Both proxy must be connected
27	MV2 encoder1 encoder2 missing.	Both encoder must be connected
28	MV2 error congruence frequencies.	redundancy check failed on the measure.
29	MV2 encoder supply missing.	Encoder not properly fed
133 (0x85) ¹	TWO-HAND concurrent failed	Two-hands switch has to change state simultaneously
134 (0x86) ²	Not started	Start test failed
137 (0x89) ³	Waiting for restart	The input has manual reset and has not been restarted

Table 3

OSSD Diagnostics		
0	OSSD diagnostics ok	
1	Enable Missing	
2	Waiting for restart OSSD	
3	Feedback K1/K2 missing	
4	Waiting for other micro	Redundancy check failed on OSSD
5	OSSD power supply missing	
6	Exceeded maximum time restart	
7	Feedback K1 K2 external not congruous CAT2	Applicable to MOR4 e MOR4S8 modules configured in CAT2

Table 4

➔ If there are diagnostics for more than one I/O, the **I/O index** and **diagnostic code** signals are sent in turn every 500ms.

¹ The diagnostic 133, 134 and 137 do not provide visual error message on the LED DSC
² The diagnostic 133, 134 and 137 do not provide visual error message on the LED DSC
³ The diagnostic 133, 134 and 137 do not provide visual error message on the LED DSC

SIGNALS AND PINOUT

MEANING	LED					
	ON	RUN	IN FAIL	EXT FAIL	LED1	LED2
	GREEN	GREEN	RED	RED	RED/GREEN	RED/GREEN
Startup - Initial test	ON	ON	ON	ON	ON	ON
Waiting for configuration from M1	ON	blinking	OFF	OFF	OFF	OFF
Received configuration from M1	ON	ON	OFF	OFF	see the modules tables	

Table 1 – Initial/ dynamic view.

Module DSC-MBC

<p>DB9 – male (front view)</p>	Pin	Signal
	1	-
	2	CAN_L
	3	CAN_GND
	4	-
	5	CAN_SHIELD
	6	-
	7	CAN_H
	8	-
	9	-
Housing	CAN_SHIELD	

LED OPR		
STATUS	INDICATION	DESCRIPTION
GREEN	OPERATIONAL	OPERATIONAL status
GREEN blinking slow	PRE-OPERATIONAL	PRE-OPERATIONAL status
GREEN 1 flash	STOPPED	STOPPED status
GREEN blinking fast	Autobaud	Baud rate detection
RED	EXCEPTION	EXCEPTION status
LED ERR		
STATUS	INDICATION	DESCRIPTION
OFF	-	Normal operation
RED 1 flash	Warning level	A bus error counter has reached the warning level
RED blinking fast	LSS	LSS service operative
RED 2 flashes	Event Control	Detected <i>Node Guarding</i> (NMT master or slave) or <i>Heartbeat</i> (Consumer)
RED	Lack of BUS	BUS not working

Module DSC-MBD

	Pin	Signal	Description
	1	V-	Negative BUS power supply
	2	CAN_L	CAN low bus line
	3	SHIELD	Cable shield
	4	CAN_H	CAN high bus line
5	V+	Positive BUS power supply	

(front view)

LED NET		
STATUS	INDICATION	DESCRIPTION
GREEN	On-line connected	1 or more connections established
GREEN blinking (1Hz)	On-line non connected	No connection established
RED	Critical connection error	MBD unable to communicate
RED blinking (1Hz)	Time-out of 1 or more connection	One or more I/O device in time-out
GREEN/RED alternate	TEST	MBD in Test
LED STS		
STATUS	INDICATION	DESCRIPTION
GREEN	-	Normal operation
GREEN blinking (1Hz)	Pending	Configuration incomplete, MBD waiting for activation
RED	Fatal error	One or more unrecoverable errors detected
RED blinking (1Hz)	Error	One or more recoverable errors detected
GREEN/RED alternate	TEST	MBD in Test

Module DSC-MBP

<p>DB9 – female (front view)</p>	Pin	Signal	Description
	1	-	-
	2	-	-
	3	B-line	Positive RxD/TxD, RS485 level
	4	RTS	Request to send
	5	GND Bus	0VDC (isolated)
	6	5V	+5VDC (isolated/short circuit protected)
	7	-	-
	8	A-line	Negative RxD/TxD, RS485 level
	9	-	-
Housing	Cable shield	Internally connected to the Anybus protective earth via cable shield filters according to the PROFIBUS standard.	

LED MODE		
STATUS	INDICATION	DESCRIPTION
GREEN	On-line	data exchange
GREEN blinking	On-line	CLEAR
RED blinking (1 flash)	Parameterization error	rif. IEC 61158-6
RED blinking (2 flashes)	PROFIBUS configuration error	configuration data MASTER or MBP wrong
LED STS		
STATUS	INDICATION	DESCRIPTION
OFF	MBP not initialized	Status SETUP o NW_INIT
GREEN	Initialized	End of initialization NW_INIT
GREEN blinking	Initialized with diagnostic active	EXTENDED DIAGNOSTIC bit set
RED	Exception error	EXCEPTION status

Module DSC-MBEC

LED STS		
STATUS	INDICATES	DESCRIPTION
OFF	INIT	INIT or no power
Green	OPERATIONAL	OPERATIONAL state
Green blinking	PRE-OPERATIONAL	PRE-OPERATIONAL state
Green blinking (1 flash)	SAFE-OPERATIONAL	SAFE-OPERATIONAL state
Red	(Fatal Event)	System locked
LED ERR		
STATUS	INDICATES	DESCRIPTION
OFF	No error	No error or no power
RED blinking (1 flash)	Configuration not valid	Status change requested by master not possible
RED blinking (2 flashes)	Watchdog timeout	Synch manager watchdog timeout
Red	Controller fault	Anybus module in EXCEPTION state

Module DSC-MBEI

LED NET		
STATE	INDICATES/DESCRIPTION	
OFF	No power or no IP address	
GREEN	On-line, connected	
GREEN blinking	On-line, not connected	
RED	Duplicate IP address	
RED blinking	Connection timeout	
LED STS		
STATE	INDICATES	DESCRIPTION
OFF	No power	-
GREEN	RUN state	-
GREEN blinking	Not configured	-
RED	Fatal error	One or more non-recoverable errors detected
RED blinking	Error	One or more recoverable errors detected

Module DSC-MBEI2B

LED NET		
STATE	STATE	
OFF	No power or no IP address	
GREEN	On-line, connected	
GREEN blinking	On-line, not connected	
RED	Duplicate IP address	
RED blinking	Connection timeout	
LED STS		
STATE	STATE	STATE
OFF	No power	-
GREEN	RUN state	-
GREEN blinking	Not configured	-
RED	Fatal error	One or more non-recoverable errors detected
RED blinking	Error	One or more recoverable errors detected

Module DSC-MBEP

LED NET		
STATE	INDICATES	DESCRIPTION
OFF	Offline	<ul style="list-style-type: none"> No power Connection with IO controller not present
GREEN	Online (Run)	<ul style="list-style-type: none"> Established connection with IO controller IO controller in RUN state
GREEN blinking	Online (Stop)	<ul style="list-style-type: none"> Established connection with IO Controller IO Controller in STOP state
LED STS		
STATE	INDICATES	DESCRIPTION
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 blinking (1 flash)	Diagnostic event (s)	Diagnostic event (s) present
GREEN blinking (2 flashes)	Blink	Used to identify the network node
RED	Exception	Module in EXCEPTION state
RED blinking (1 flash)	Configuration error	Identification error
RED blinking (2 flashes)	IP address error	IP address not configured
RED blinking (3 flash)	Station name error	Station name not configured
RED blinking (4 flashes)	Internal error	Module has encountered a major internal error

Module DSC-MBEP2

LED NET		
STATE	INDICATES	DESCRIPTION
OFF	Offline	<ul style="list-style-type: none"> No power Connection with IO controller not present
GREEN	Online (Run)	<ul style="list-style-type: none"> Established connection with IO controller IO controller in RUN state
GREEN blinking	Online (stop)	<ul style="list-style-type: none"> Established connection with IO Controller IO Controller in STOP state
LED STS		
STATE	INDICATES	DESCRIPTION
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 blinking (1 flash)	Diagnostic event (s)	Diagnostic event (s) present
GREEN blinking (2 flashes)	Blink	Used to identify the network node
RED	Exception	Module in EXCEPTION state
RED blinking (1 flash)	Configuration error	Identification error
RED blinking (2 flashes)	IP address error	IP address not configured
RED blinking (3 flash)	Station name error	Station name not configured
RED blinking (4 flashes)	Internal error	Module has encountered a major internal error

Module DSC-MBEM

LED NET		
STATE	INDICATES/DESCRIPTION	
OFF	No power or no IP address	
GREEN	Module is in Process Active or Idle state	
GREEN blinking	Waiting for connections	
RED	Duplicate IP address, or FATAL event	
RED blinking	Process Active Timeout	
LED STS		
STATE	INDICATES	DESCRIPTION
OFF	No power	-
GREEN	RUN	Normal operation
RED	Fatal error	<ul style="list-style-type: none"> Major fault; module in state EXCEPTION (or fatal event)
RED blinking	Error	<ul style="list-style-type: none"> Minor fault in diagnostic object IP conflict

Module DSC-MBMR

<p>DB9 – female (front view)</p>	Pin	Direction	Signal	Description
	Housing	-	PE	Protective Earth
	1	-	GND	Bus polarization 0VDC (isolated)
	2	OUT	5V	Bus polarization +5VDC (isolated)
	3	IN	PMC	Connect to pin 2 for RS-232 / Leave unconnected for RS-485
	4	-	-	-
	5	Bidirectional	B-line	RS-485 B-line
	6	-	-	-
	7	IN	Rx	RS-232 Data Receive
	8	OUT	Tx	RS-232 Data Transmit
9	Bidirectional	A-line	RS-485 A-line	

LED COM		
STATE	INDICATES	DESCRIPTION
OFF	No power or no data exchange	-
YELLOW	Frame Reception or Transmission	Data exchange
RED	Fatal Error	One or more non-recoverable errors detected
LED STS		
STATE	INDICATES	DESCRIPTION
OFF	Initializing or no power	-
GREEN	Module initialized	Module initialized – no error
RED	Fatal Error	One or more non-recoverable errors detected
RED blinking (1 flash)	Communication fault or configuration error	<ul style="list-style-type: none"> Invalid setting in Network Configuration Object Setting in Network Configuration Object has been changed during operation
RED blinking (2 flashes)	Application diagnostic available	-

Module DSC-MBU

LED CONNECT		
STATE	INDICATES	DESCRIPTION
Green	USB connected	Module connected to Pc via USB
OFF	USB not connected	Module not connected

MEANING	FAULT DIAGNOSIS					
	LED				LED1	LED2
	ON	RUN	IN FAIL	EXT FAIL		
	GREEN	GREEN	RED	RED	RED/GREEN	RED/GREEN
Internal fault microcontroller	ON	OFF	2 flashes*	OFF	see the modules tables	
Internal board fault	ON	OFF	3 flashes*	OFF		
Configurazione Error	ON	OFF	5 flashes*	OFF		
BUS communication Error	ON	OFF	5 flashes*	OFF		
BUS communication interruption	ON	OFF	ON	OFF		
Detected an identical module	ON	OFF	5 flashes*	5 flashes		

* The LED frequency of flashing is: ON for 300ms and OFF for 400ms, with an interval between two sequences of 1s.

EXAMPLES OF DIAGNOSTICS

Example 1

In the example shown in Figure 3, Input 1 (connected to module M1) is tested with the M1-T1 test signal. During wiring, the 24Vdc is connected to input 1 instead of the M1-T1 test signal.

- The I/O index and Diagnostic code fields assume the following values: 1 - 20 to indicate the diagnostics on input 1 of module M1 (*Connection error*).

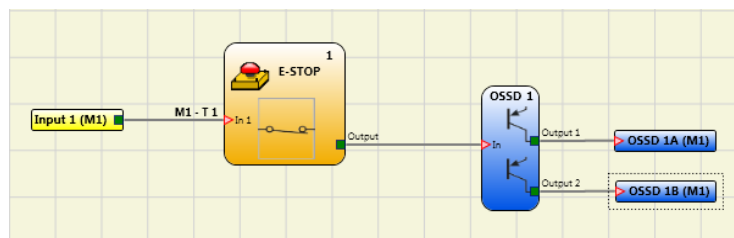


Figure 3

Example 2

In this example, the I/O index corresponds to the logical block and not to the physical terminal on module M1.

In Figure 4 for example, the two-hand element connected to the Input 1 and Input 2 physical terminals corresponds to I/O index No. 1 and the emergency stop connected to the Input 3 and Input 4 terminals corresponds to I/O index No. 2.

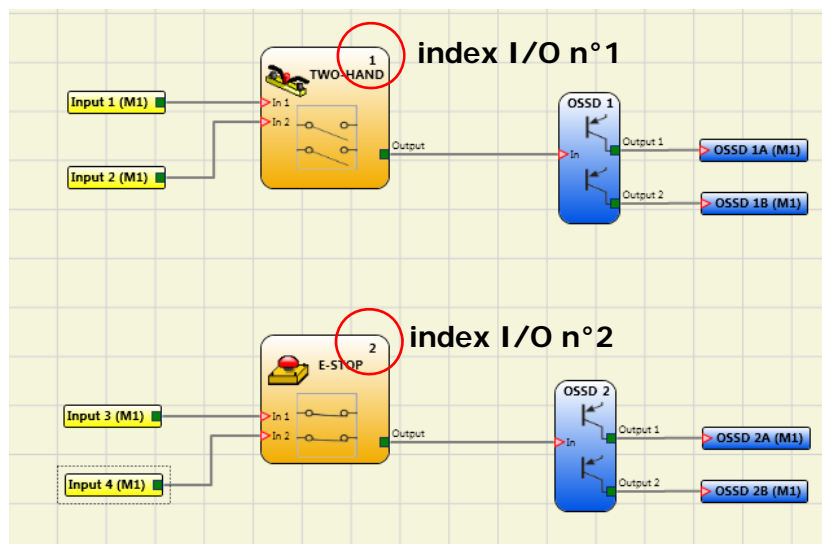


Figure 4

Example 3

The example in Figure 5 is similar to example 1, except in this case Input1 is connected to module MI16 and is tested with the MI16-T1 test signal.

During wiring, the 24Vdc is connected to input 1 instead of the MI16-T1 test signal.

Input 1 has diagnostic code 10 (OUT_TEST error) and OUT_TEST MI16-T1 has diagnostic code 8 (Connection error).

- The I/O index and Diagnostic code fields assume the following values: **1 - 20** to indicate the diagnostics on input 1 of module MI16.

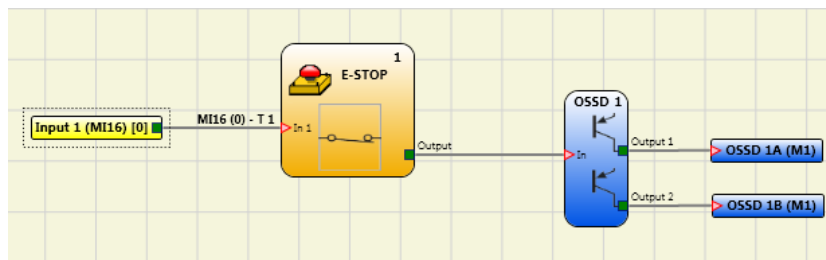


Figure 5

In the example shown in Figure 6 the manual reset function is enabled on OSSD 1. The pushbutton connected to input 1 is pressed without sending a reset command.

- The I/O index and Diagnostics code fields assume the following values: **192 - 2**
- to indicate the diagnostics on OSSD 1A/1B (*Table 2: 192 = first output*).
- to indicate the diagnostic code (*Table 4: 2 = Waiting for OSSD to restart*).

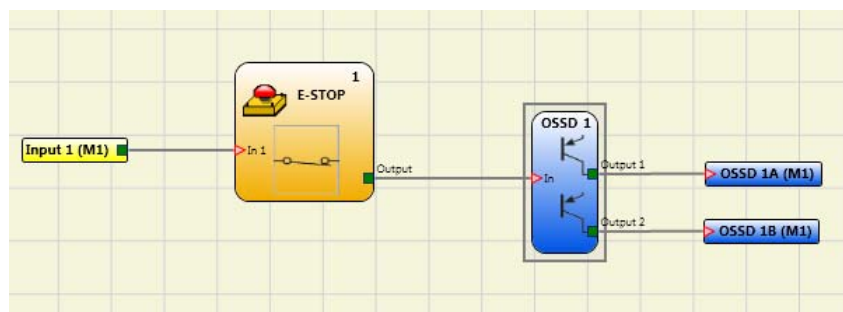


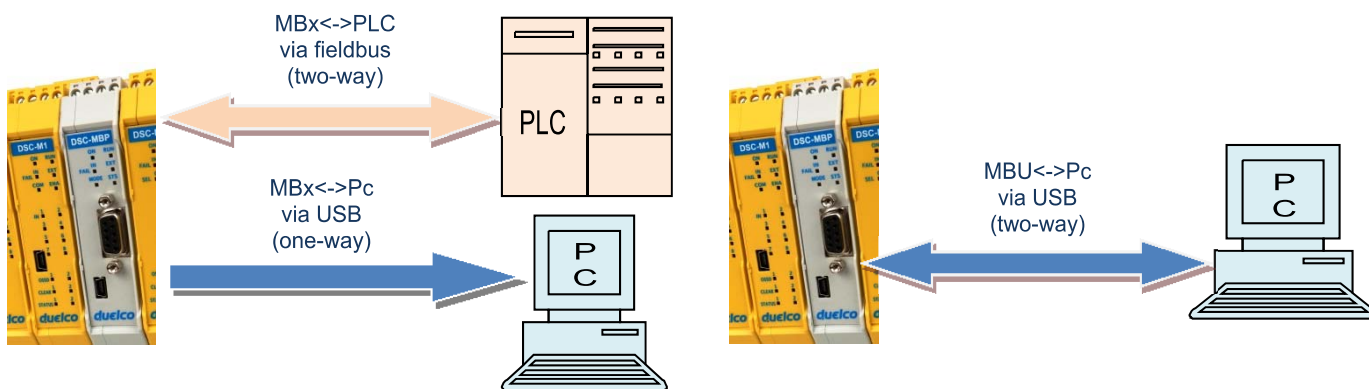
Figure 6

BUS CONFIGURATOR USER INTERFACE

The bus module is configured using the USB miniB interface on the front panel and "BUS CONFIGURATOR" SW installed on the DSDESIGNER CD ROM disk.

This SW can be used for configuration/communication of the DSC system with a PC (using an MBU module) or to display data transmitted via bus (via connection to the USB port of a bus module).
The diagram below is helpful for understanding possible connections:

EXAMPLES OF CONNECTION



M1 MBx (bus)

M1 MBU (USB)

It is important to note that the BUS CONFIGURATOR behaves differently, depending on whether communication is with an MBx module or an MBU module:

- MBx MODULE: THE SOFTWARE ONLY ALLOWS DATA TRANSMITTED VIA BUS TO BE DISPLAYED.
- MBU MODULE: THE SOFTWARE ALLOWS TWO-WAY DATA TRANSMISSION MBU↔PC (in this case the programmer can set the Fieldbus input directly via computer).

The data sets to be transmitted, any modular I/Os, the Fieldbus input, the address of the module in the fieldbus network and, where applicable, the baud rate are all settable parameters.
The address field range depends on the type of fieldbus that is installed.

Graphic interface

➔ Module configuration must be performed with the system switched off (outputs OFF).

You can query module configuration at any time while the module is in use. To configure the MBx module, proceed as follows:

1. connect the module to the 24VDC±20% power supply via the terminal block;
2. connect the USB cable to the PC and to the MBx (or MBU) module;
3. click on the "**BUS CONFIGURATOR – USER INTERFACE**" desktop icon.

The configuration window shown at the side is displayed (Figure 7).

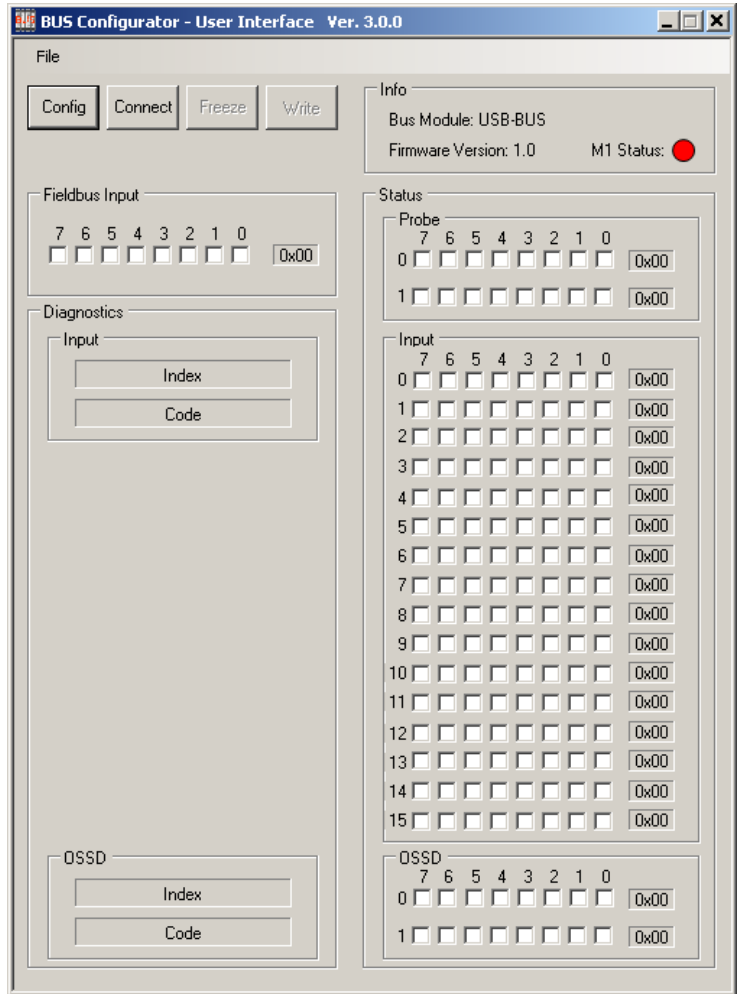


Figure 7

4. Press the "CONNECT" key.

The program recognises that a bus module is connected (Figure 8); the fieldbus model, firmware version and Master M1 status are displayed:

- green=M1 active (RUN);
- red=M1 not active (e.g. communication with Designer).



Figure 8

Once the module is connected it is recognised and you can configure the parameters by selecting the different cards shown in figures 9 to 11 (**CONFIG key- figure ↗**); press the **WRITE** key to send the configuration data to the module.

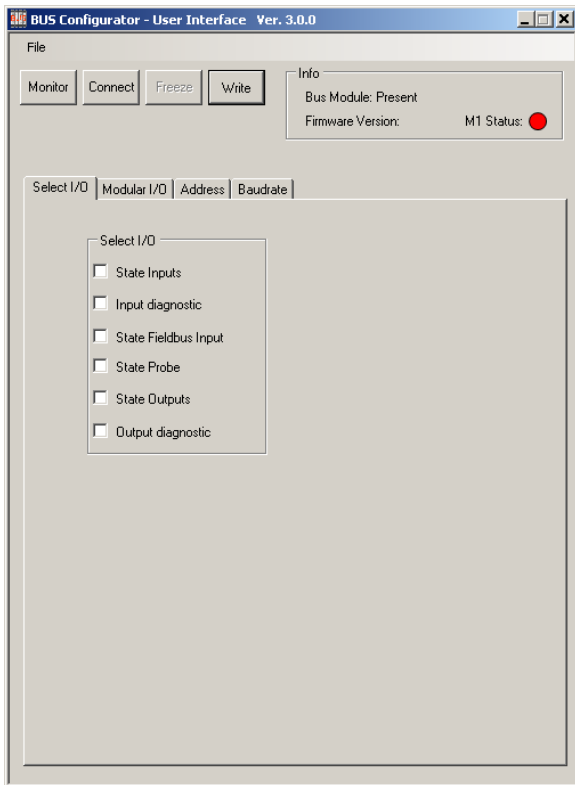


Figure 9 - I/O selection

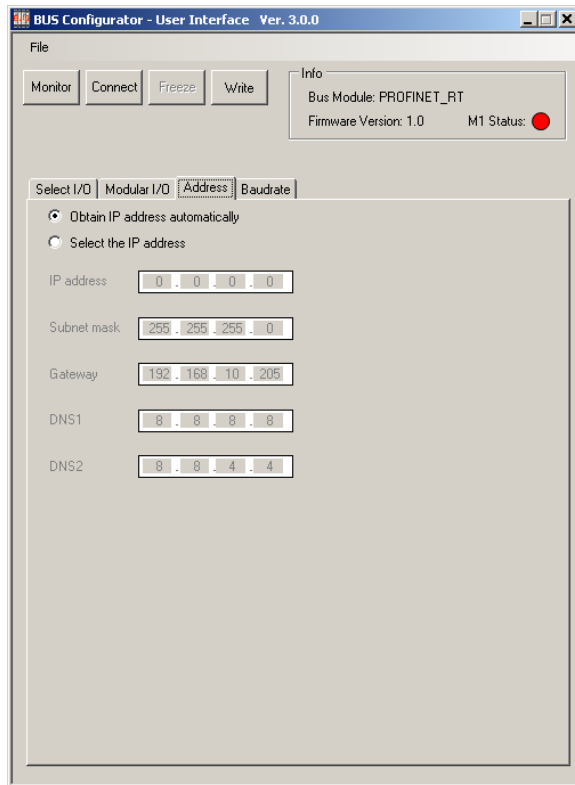


Figure 10 - Address

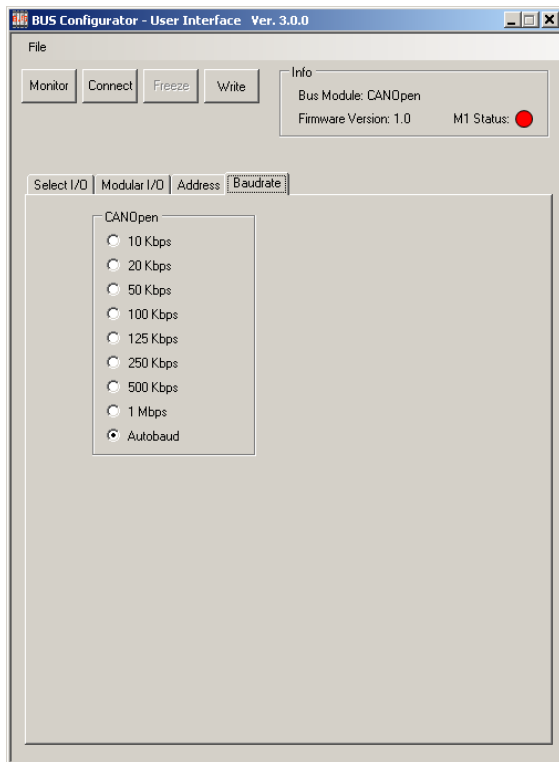


Figure 11 - Baud rate

	ADDRESS	BAUDRATE	DATA SETS
MBC	127	AUTO	input status, fieldbus input status, probe status, output status
MBD	63	AUTO	input status, fieldbus input status, probe status, output status
MBP	126	N/A	input status, fieldbus input status, probe status, output status
MBEC	0	N/A	input status, fieldbus input status, probe status, output status
MBEI	0.0.0.0	AUTO	input status, fieldbus input status, probe status, output status
MBEP	0.0.0.0	N/A	input status, fieldbus input status, probe status, output status

Table 5 - Default values

After setting the parameters, click on the "MONITOR" key.

- As soon as the bus module receives the data, the configurator enters the **dynamic status screen** condition.
- The input and output status and relative diagnostics (displayed cyclically if one or more incorrect events occur) are illustrated in Figure 12 and Figure 13.
- The Fieldbus input whose logical status can be changed freely by the programmer (with the MBU module only) or via the fieldbus are illustrated in Figure 14.

Input/output status

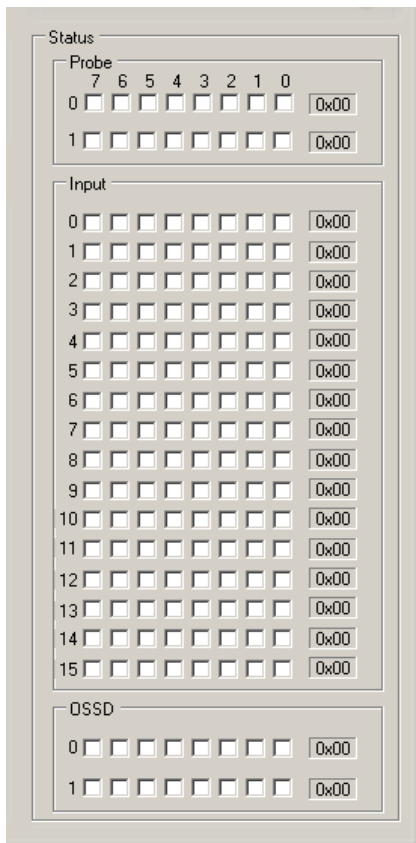


Figure 12

Input/output diagnostics

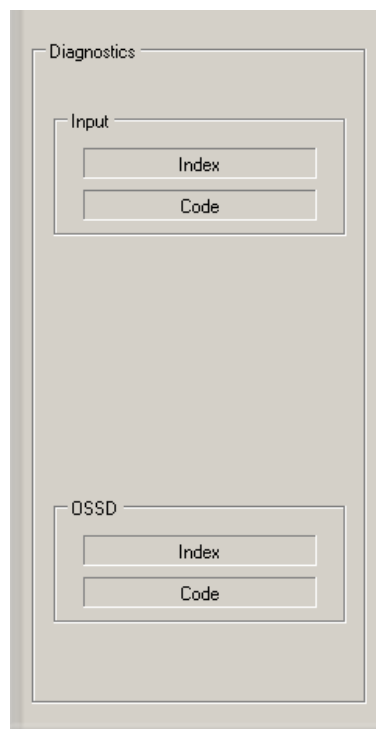


Figure 13

Fieldbus input (MBU only)



Figure 14

PLEASE REFER TO THE EXAMPLE IN Figure 15 AND Figure 16 SHOWING A PROJECT CREATED USING DESIGNER AND HOW THIS IS PRESENTED BY THE CONFIGURATOR TO SEE HOW THE PARAMETERS ARE SHOWN.

EXAMPLES OF DSD CONFIGURATION AS PRESENTED BY THE BUS CONFIGURATOR

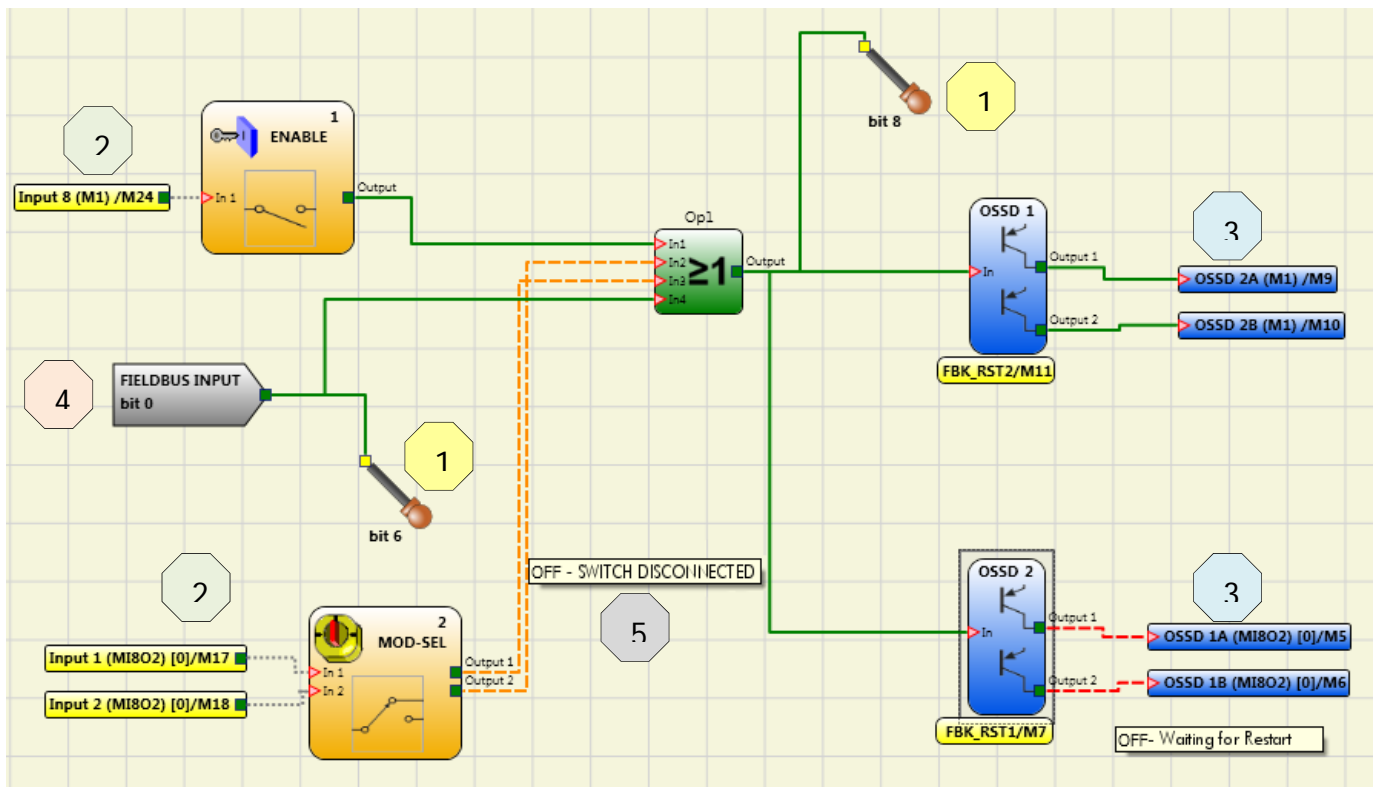
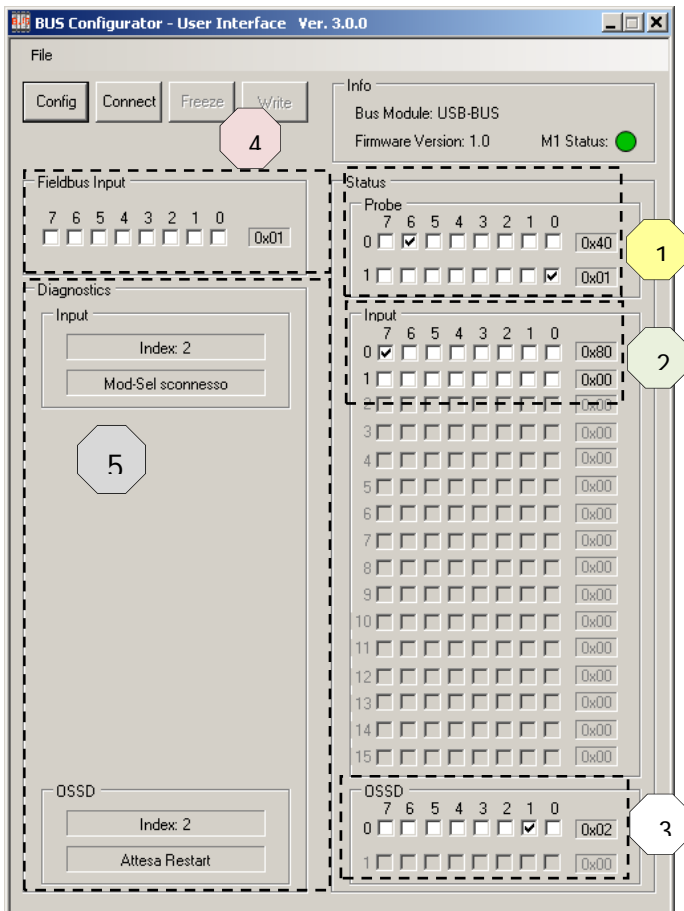


Figure 15 – Example of project on DSD



- Input 1 ENABLE is connected to terminal 8 on M1. Its status (zero or one) is shown on bit 7 of byte 0 reserved for inputs.
- Input 2 MOD-SEL is connected to screws 1 and 2 on MI8O2 with diagnostics indicating Mod-sel disconnected. Its status is shown on the pair of bits 0 and 1 of byte 1 reserved for inputs. Diagnostics are shown in the section reserved for input diagnostics with the index field showing 2 and the relative diagnostics.
- The probes on bit 6 and bit 8 are green and the relative bits on the screen are checked. Bit 8 is shown as bit 0 of the second byte.
- OSSD 1 is ON and connected to the second pair of M1 outputs. Its status is shown on bit 1 of byte 0 reserved for outputs.
- OSSD 2 is OFF with diagnostics indicating wait for Restart and is connected to the second pair of MI8O2 outputs. Its status is shown on bit 3 of byte 0 reserved for outputs. Diagnostics are shown in the section reserved for OSSD diagnostics with the index field showing 2 and the relative diagnostics.
- In the Virtual Input section, bit 0 has been selected and the fieldbus input bit 0 is green in the DSD project.

Figure 16