GS33910060800

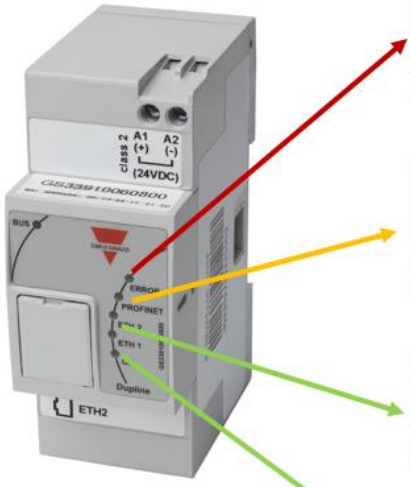
GS33900000800

Profinet gateway start-up and mini-webserver guide

Basic notions about Carlo Gavazzi's Profinet Gateway

The GS3391 0060 800 is a Profinet gateway with slave function.
The module has a 2-port Ethernet switch RJ45 for connection to Profinet.
The module has to be mounted in association with the master generator GS3390 0000 800: up to 7 master generators can be connected to one gateway.
In this guide we will describe the mini-webserver as useful instrument to be used to check the communication between Dupline and Profinet. The installation of a Profinet network will not be discussed.

First of all it is needed to check that the installation and settings of the devices has been carried correctly.

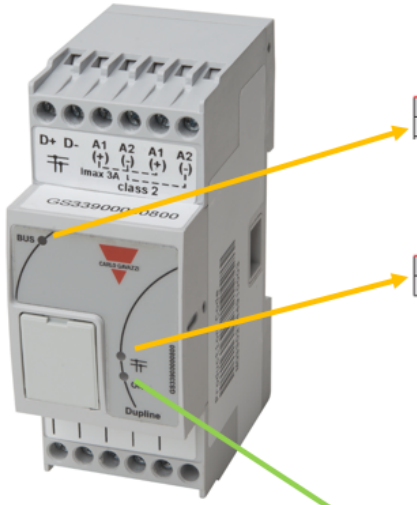


LED status	Description	Comments (*)
ON	Fatal event	Major internal error
1 flash	Station name error	Station name not set
2 flashes	IP address error	IP address not set
3 flashes	Configuration error	Expected Identification differs from Real Identification

LED status	Description	Comments (*)
OFF	Offline	No power, No connection with IO controller
ON	Online (RUN)	Connection with IO Controller established, IO Controller in RUN state
1 flash	Online (STOP)	Connection with IO Controller established, IO Controller in STOP state or IO data bad, IRT synchronization not finished
Blinking	Blink	Used by engineering tools to identify the node on the network

Name	Colour	Behaviour
ETH1:RJ45 Link1	Green	ON: Cable connected, OFF: Cable disconnected
EHT1: RJ45 Activity1	Yellow	Flashing: communication
ETH2:RJ45 Link2	Green	ON: Cable connected, OFF: Cable disconnected
EHT2: RJ45 Activity2	Yellow	Flashing: communication

Name	Colour	Behaviour
Power supply	Green	ON: Supply ON, OFF: Supply OFF



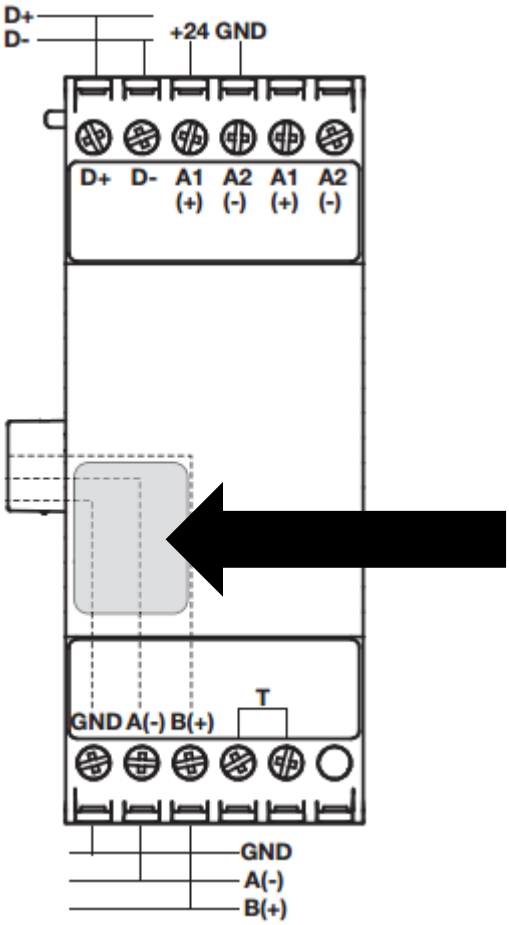
Name	Colour	Behaviour
HS-BUS	Yellow	ON: Bus OK, OFF: Bus not OK

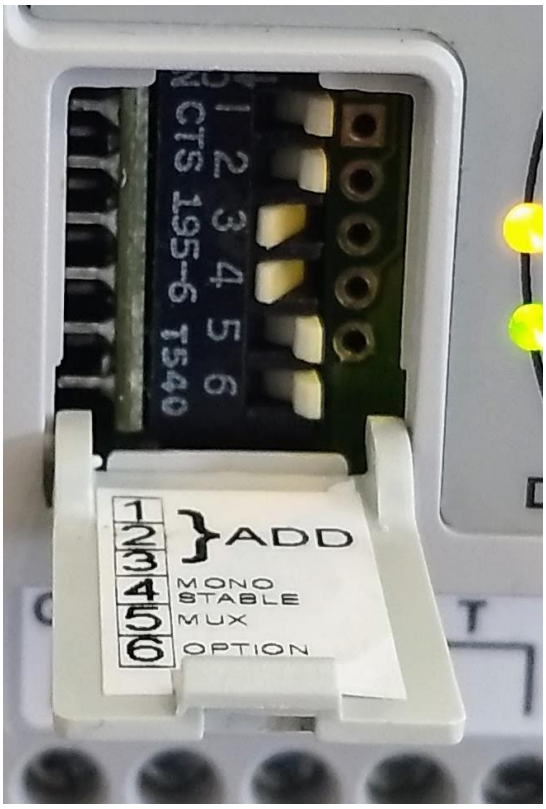
Name	Colour	Behaviour
Dupline	Yellow	Steady ON: Dupline bus OK

Name	Colour	Behaviour
Power supply	Green	ON: Supply ON, OFF: Supply OFF

The communication can be checked by looking at the LEDs of channel generators and Profinet gateway.
Note: the gateway's functionality on Dupline side can be checked without connecting it to a Profinet network. In this case, the "ERROR" LED will be flashing red and the "PROFINET" LED will be always OFF.

The channel generators GS33900000800 must be correctly set by the built-in DIP switches.





Switch 1-2-3 Device address: every MCG has its address.

DS1	DS2	DS3	Address
Off	Off	On	1
Off	On	Off	2
Off	On	On	3
On	Off	Off	4
On	Off	On	5
On	On	Off	6
On	On	On	7

Switch 4 Monostable / Split I/O mode: if ON monostable mode is selected

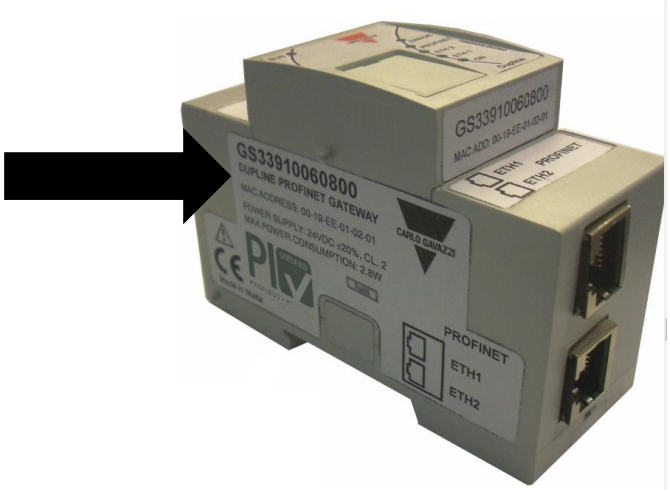
Switch 5 Mux Analogue mode: if ON Mux Analogue mode is selected

Switch 6 Extended digital output mode: if ON more digital output are available (See Datasheet)

In the example picture, DIP switches 3 and 4 are ON, so the MCG has address 1 and it is working in monostable mode.

MINI-WEBSERVER

The GS3391 0060 800 starts by default in DHCP mode as per Profinet standards.
By Profinet PLCs it is possible to search for it on the network and it is possible to know the IP address that the Profinet Master has given to it.
If a Profinet network is not available, it is possible to reach the Profinet gateway by scanning the network.
Using a IP scanner software (https://www.advanced-ip-scanner.com/) installed in your PC and looking for the MAC ADDRESS of the GS3391 0060 800.



Advanced IP Scanner

File Actions Settings View Help

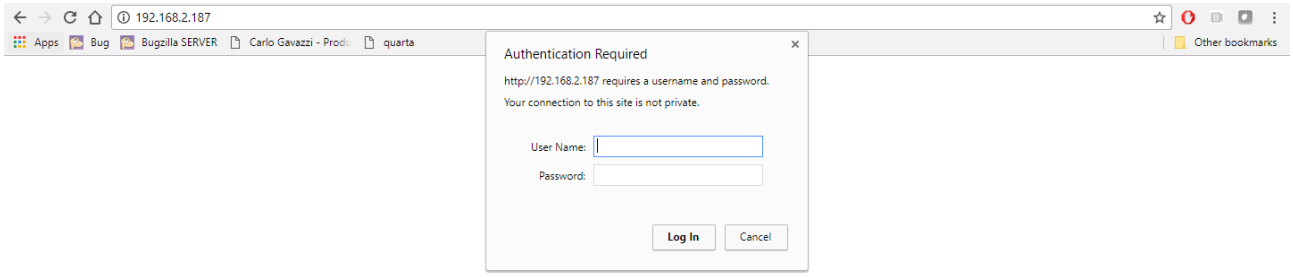
Scan

192.168.2.1 - 192.168.2.255

Results Favorites

Status	Name	IP	Manufacturer	MAC address
	PC-PRD-ENRG3-B	192.168.2.209	MSI	00:16:17:AD:B9:D8
	MX8:193	192.168.2.13	Summit Data Communications	00:17:23:07:26:E4
	MX8_194	192.168.2.14	Summit Data Communications	00:17:23:07:9F:01
	MX8001	192.168.2.196	Summit Data Communications	00:17:23:0A:7C:21
	pc-prd-aaaaaa.cg_controls.com	192.168.2.45	Summit Data Communications	00:17:23:13:A6:46
	MX8001	192.168.2.235	Summit Data Communications	00:17:23:14:D5:35
	QL Portable Printer	192.168.2.36	Z-Com, Inc.	00:19:70:5B:84:8A
	nb-costantini.cg_controls.com	192.168.2.35	Z-Com, Inc.	00:19:70:7A:ED:21
	192.168.2.48	192.168.2.48	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:00:15:71
	192.168.2.174	192.168.2.174	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:01:02:01
	192.168.2.77	192.168.2.77	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:02:95
	192.168.2.51	192.168.2.51	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:03:D2
	192.168.2.78	192.168.2.78	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:04:7C
	192.168.2.233	192.168.2.233	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:06:B2
	192.168.2.234	192.168.2.234	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:07:EE
	192.168.2.232	192.168.2.232	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:07:FC
	192.168.2.71	192.168.2.71	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:09:11
	192.168.2.231	192.168.2.231	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:0D:48
	192.168.2.61	192.168.2.61	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:0F:74
	192.168.2.76	192.168.2.76	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:12:40
	192.168.2.250	192.168.2.250	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:18:D1
	192.168.2.102	192.168.2.102	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:19:6D
	192.168.2.241	192.168.2.241	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:1D:B5
	192.168.2.187	192.168.2.187	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:1E:06
	pc-prd-enrg7-b.cg_controls.com	192.168.2.47	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:1F:6B
	192.168.2.244	192.168.2.244	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:23:D8
	192.168.2.50	192.168.2.50	CARLO GAVAZZI CONTROLS SPA-Controls Division	00:19:EE:10:23:DC

Once the IP address is known, it is possible to access the mini-webserver by typing the IP address on a web browser.

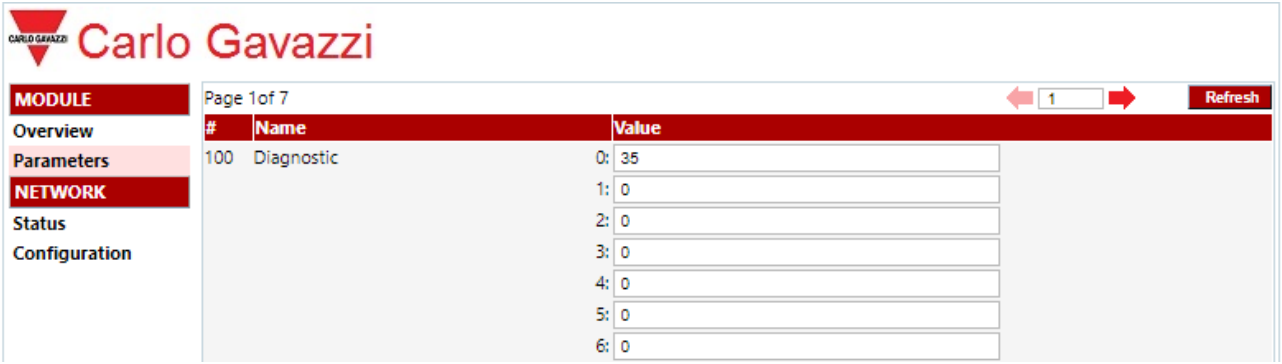


User Name : user
Password: dupline

The homepage shows the module name, the serial number of the Profinet network card, the FW version, the uptime and the real time cpu load.
By entering the NETWORK sections it is possible to see the status of the network and to set the IP settings of the gateway (IP address, DCHP or static).
It is not suggested to change parameters from the webserver: they should be set only by Profinet master.

Parameters

The section called parameters contains all the data collected through Dupline by the gateway Profinet: it is a table representation of the variables that the gateway will publish on Profinet.



On the upper right it is possible to move from one page to the following. The page corresponds to the address of the MCG of which the variables will be shown.

The first section **DIAGNOSTIC** is common to all master channel generators and it describes which channel generators are used and how they are behaving.
There are 6 slots, each of which corresponds to one of the MCG that can be connected to the profinet gateway. On slot 0 there are diagnostics about MCG with address =1, on slot 1 MCG with address=2 and so on.
The number inside the slot is represented in decimal and it must be decoded into binary representation with 8bit.

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

DIP switches Diagnostic

From bit 4 to bit 6 the positioning of the DIP switches can be read:
bit 6: DIP switch MUX (#5) ON if =1
bit 5: DIP switch monostable (#4) ON if =1
bit 4: DIP switch #6 ON if =1

By decoding into decimal bits from 0 to 3 the diagnostic is the following:
3: communication OK
5: error on voltage level D+/ D-
6: Dupline shortcircuit

In our example, on slot 0 number 35 is shown.
This means that a MCG with address 1 is connected:
$(35)_{DEC}=(0010\ 0011)_{BIN}$

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

bit 6 = 0: MUX OFF
bit 5 = 1: monostable ON
bit 4 = 0: DIP switch #6 OFF

And regarding communication diagnostic
$(0011)_{BIN}=(3)_{DEC}$ Communication OK.

The other parameters in this page are the variables read by the MCGs from the Dupline bus.
These are the variables that will be published on Profinet bus.
For each page from 1 to 7, the variables of the MCGs (with address from 1 to 7) will be shown ordered by type:

- Digital Input
- Digital Output
- SAFE Input
- Analink Input in MNOP
- Analink Output in MNOP
- Mux Input CD
- Mux Input EF
- Mux Output IJ
- Mux Output KL

To help decoding the info of these fields Carlo Gavazzi is providing a decoding XLS file.
The user should be aware of the type of communication protocol and inputs/outputs are being used on the field.

DIGITAL INPUT

101 MCG1 Digital Input

0:	1
1:	2
2:	4
3:	16
4:	32
5:	64
6:	2
7:	128
8:	0
9:	0
10:	0
11:	0
12:	0
13:	0
14:	0
15:	0

The slots correspond to the relevant channel:
0 ↔ A | 1 ↔ B | 2 ↔ C | 3 ↔ D | 4 ↔ E | 5 ↔ F | 6 ↔ G | 7 ↔ H | 8 ↔ I |
9 ↔ J | 10 ↔ K | 11 ↔ L | 12 ↔ M | 13 ↔ N | 14 ↔ O | 15 ↔ P
For each channel the decimal number represents the in decimal the inputs activated.
Using the XLS decoding file and inserting the values from the example above, the result is:

	dec	BIN	CH	1	2	3	4	5	6	7	8
0	1	00000001	A	0	0	0	0	0	0	0	1
1	2	00000010	B	0	0	0	0	0	0	1	0
2	4	00000100	C	0	0	0	0	0	1	0	0
3	16	00010000	D	0	0	0	1	0	0	0	0
4	32	00100000	E	0	0	1	0	0	0	0	0
5	64	01000000	F	0	1	0	0	0	0	0	0
6	2	00000010	G	0	0	0	0	0	0	1	0
7	128	10000000	H	1	0	0	0	0	0	0	0
8		00000000	I	0	0	0	0	0	0	0	0
9		00000000	J	0	0	0	0	0	0	0	0
10		00000000	K	0	0	0	0	0	0	0	0
11		00000000	L	0	0	0	0	0	0	0	0
12		00000000	M	0	0	0	0	0	0	0	0
13		00000000	N	0	0	0	0	0	0	0	0
14		00000000	O	0	0	0	0	0	0	0	0
15		00000000	P	0	0	0	0	0	0	0	0

The inputs activated are:
A8. B7, C6, D4, E3, F2, G7, H1.

DIGITAL OUTPUT

The slots correspond to the relevant channel:
0 ↔ A **|** 1 ↔ B **|** 2 ↔ C **|** 3 ↔ D **|** 4 ↔ E **|** 5 ↔ F **|** 6 ↔ G **|** 7 ↔ H **|** 8 ↔ I **|**
9 ↔ J **|** 10 ↔ K **|** 11 ↔ L **|** 12 ↔ M **|** 13 ↔ N **|** 14 ↔ O **|** 15 ↔ P
For each channel a decimal number that represents the outputs that should be forced to activate can be set.
In the example 124 on slot 1 means that B2,B3,B4,B5,B6 will be activated once “Set” button is pressed.

SAFE INPUT

103 MCG1 SAFE Input

0:	251
1:	200
2:	255
3:	255
4:	255
5:	255
6:	255
7:	255
8:	255
9:	255
10:	255
11:	255
12:	255
13:	255
14:	255
15:	255

The slots correspond to the relevant channel:
0 ↔ A **|** 1 ↔ B **|** 2 ↔ C **|** 3 ↔ D **|** 4 ↔ E **|** 5 ↔ F **|** 6 ↔ G **|** 7 ↔ H **|** 8 ↔ I **|**
9 ↔ J **|** 10 ↔ K **|** 11 ↔ L **|** 12 ↔ M **|** 13 ↔ N **|** 14 ↔ O **|** 15 ↔ P
For each channel a decimal number represents the SAFE inputs status.
As slot 0 (channel A) contains the synchronization channel A1 it changes time by time, depending on the value (high or low) of the synchronization channel.
In the example above, using the decoding file we find:

SAFE DUPLINE

		dec	bin	1	2	3	4	5	6	7	8	in1	in2	in3	in4	in1			in2			in3			in4		
A	0		00000000	0	0	0	0	0	0	0	0	00	00	00	00	A1	A2	safe e valid	A3	A4	safe e valid	A5	A6	safe e valid	A7	A8	safe e valid
B	1	200	11001000	1	1	0	0	1	0	0	0	11	00	10	00	B1	B2	unsafe e invalid	B3	B4	safe e valid	B5	B6	unsafe e valid	B7	B8	safe e valid
C	2	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	C1	C2	unsafe e invalid	C3	C4	unsafe e invalid	C5	C6	unsafe e invalid	C7	C8	unsafe e invalid
D	3	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	D1	D2	unsafe e invalid	D3	D4	unsafe e invalid	D5	D6	unsafe e invalid	D7	D8	unsafe e invalid
E	4	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	E1	E2	unsafe e invalid	E3	E4	unsafe e invalid	E5	E6	unsafe e invalid	E7	E8	unsafe e invalid
F	5	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	F1	F2	unsafe e invalid	F3	F4	unsafe e invalid	F5	F6	unsafe e invalid	F7	F8	unsafe e invalid
G	6	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	G1	G2	unsafe e invalid	G3	G4	unsafe e invalid	G5	G6	unsafe e invalid	G7	G8	unsafe e invalid
H	7	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	H1	H2	unsafe e invalid	H3	H4	unsafe e invalid	H5	H6	unsafe e invalid	H7	H8	unsafe e invalid
I	8	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	I1	I2	unsafe e invalid	I3	I4	unsafe e invalid	I5	I6	unsafe e invalid	I7	I8	unsafe e invalid
J	9	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	J1	J2	unsafe e invalid	J3	J4	unsafe e invalid	J5	J6	unsafe e invalid	J7	J8	unsafe e invalid
K	10	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	K1	K2	unsafe e invalid	K3	K4	unsafe e invalid	K5	K6	unsafe e invalid	K7	K8	unsafe e invalid
L	11	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	L1	L2	unsafe e invalid	L3	L4	unsafe e invalid	L5	L6	unsafe e invalid	L7	L8	unsafe e invalid
M	12	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	M1	M2	unsafe e invalid	M3	M4	unsafe e invalid	M5	M6	unsafe e invalid	M7	M8	unsafe e invalid
N	13	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	N1	N2	unsafe e invalid	N3	N4	unsafe e invalid	N5	N6	unsafe e invalid	N7	N8	unsafe e invalid
O	14	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	O1	O2	unsafe e invalid	O3	O4	unsafe e invalid	O5	O6	unsafe e invalid	O7	O8	unsafe e invalid
P	15	255	11111111	1	1	1	1	1	1	1	1	11	11	11	11	P1	P2	unsafe e invalid	P3	P4	unsafe e invalid	P5	P6	unsafe e invalid	P7	P8	unsafe e invalid

Only channel B is configured, B1/B2 input is not transmitting correctly, B3/B4 is working properly and in safe status, B5/B6 is working properly but in unsafe status, B7/B8 is working properly and in safe status.

ANALINK INPUT MNOP

112 MCG1 Analink In MNOP		
	0:	254
	1:	226
	2:	0
	3:	10
	4:	0
	5:	0
	6:	0
	7:	0
	8:	0
	9:	0
	10:	0
	11:	0
	12:	0
	13:	0
	14:	0
	15:	0
	16:	0
	17:	0
	18:	0
	19:	0
	20:	0
	21:	0
	22:	0
	23:	0
	24:	0
	25:	0
	26:	0
	27:	0
	28:	0
	29:	0
	30:	0
	31:	0

The slots correspond to the relevant input: from 0 to 31 the channels from M1 to P8 are represented.
In the example above, using the decoding file we find:

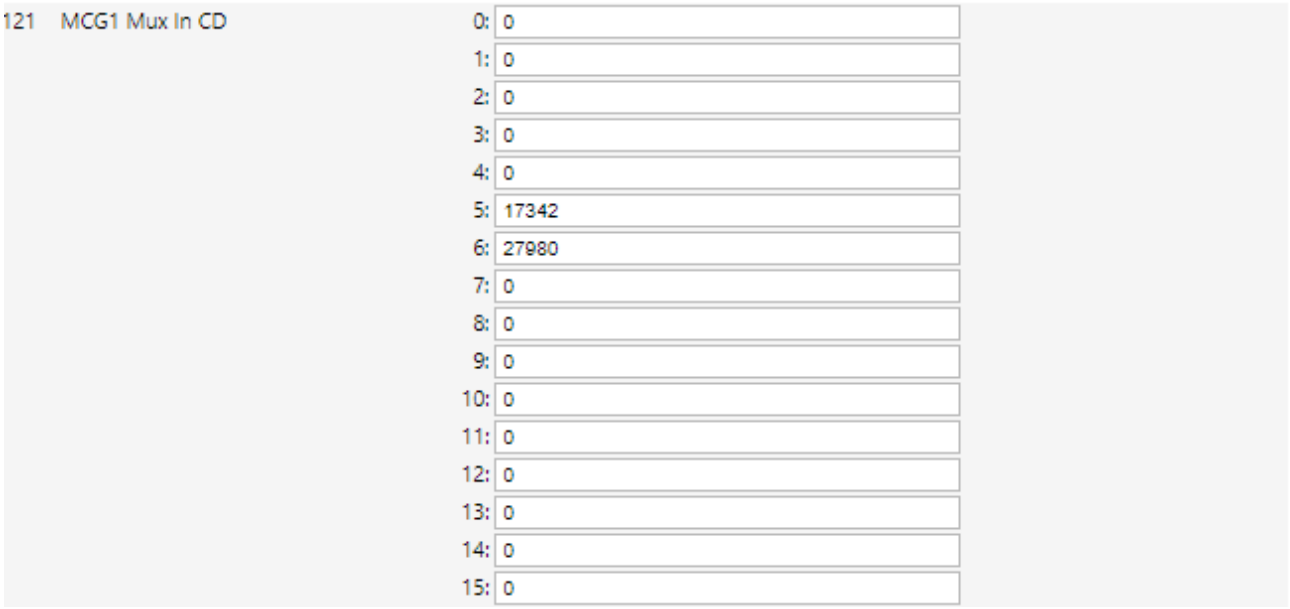
ANALINK 0/10V			
	dec	V	CH INPUT
0	254	10.00	M1
1	226	8.90	M2
2	0	0.00	M3
3	10	0.39	M4
4		0.00	M5
5		0.00	M6
6		0.00	M7
7		0.00	M8
8		0.00	N1
9		0.00	N2
10		0.00	N3
11		0.00	N4
12		0.00	N5
13		0.00	N6
14		0.00	N7
15		0.00	N8
16		0.00	O1
17		0.00	O2
18		0.00	O3
19		0.00	O4
20		0.00	O5
21		0.00	O6
22		0.00	O7
23		0.00	O8
24		0.00	P1
25		0.00	P2
26		0.00	P3
27		0.00	P4
28		0.00	P5
29		0.00	P6
30		0.00	P7
31		0.00	P8

M1 input value is 10 V
M2 input value is 8.9 V
M3 has no input or input is 0V
M4 input value is 0.39 V

ANALINK OUTPUT MNOP

The slots correspond to the relevant outputs value that can be set: from 0 to 31 the channels from M1 to P8 are represented, values go from 0 to 254.
In the example above the value 254 is forced on slot 2, so channel M3 will be set to maximum voltage/current.

MUX INPUT CD and EF



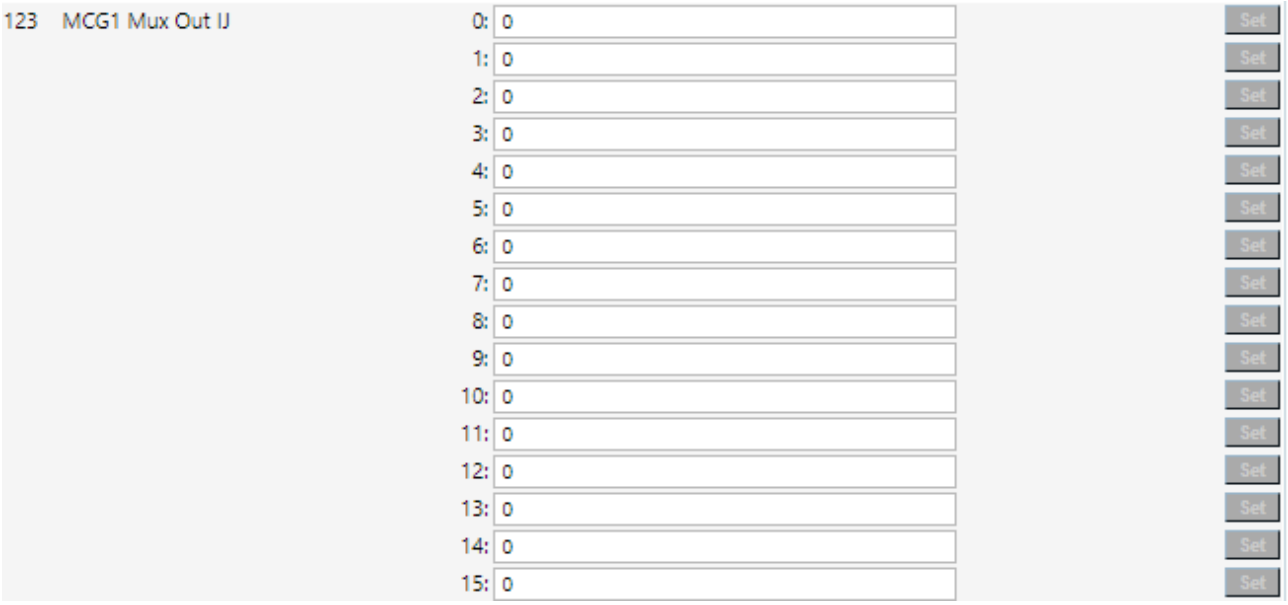
The slots correspond to the relevant inputs from 0 to 15 channels from CD1 to CDF are represented, while on the following 16 ones EF1 to EFF are represented.
On the example above, using the decoding file, the result is:

BCD MUX

	dec	V	MUX CH
0		0	CD0
1		0	CD1
2		0	CD2
3		0	CD3
4		0	CD4
5	17342	5.2925199	CD5
6	27980	8.539079	CD6
7		0	CD7
8		0	CD8
9		0	CD9
10		0	CDA
11		0	CDB
12		0	CDC
13		0	CDD
14		0	CDE
15		0	CDF

On input CD5 there are 5.29 V, on input CD6 8.53 V.

MUX OUTPUT IJ and KL



The slots correspond to the relevant outputs value that can be set: from 0 to 15 the channels from IJ1 to IJF are represented and same for the following ones from KL1 to KLF.
Output value can be forced by setting a decimal value and pressing on set button.