516-II DMX to 0-10 V Converter

user manual

Martin

Printed in Denmark.

P/N 35000060, Rev. B

Thank you for selecting the Martin 516-II DMX to 0-10 V Converter. This device converts the digital input from Martin and DMX protocol controllers to 0 - 10 V output for use with analog lighting fixtures and other devices.

SAFETY

The 516-II DMX to 0-10 V Converter is not for household use. For safe operation, read this manual before use and follow the safety precautions listed below. If you have questions about how to operate the controller safely, please contact your Martin distributor or dealer.

- **Disconnect the device from AC power before removing fuses or any part, and when not in use.**
- **Always ground (earth) the device electrically.**
- **Use only a source of AC power that complies with local building and electrical codes and has both overload and ground-fault protection.**
- **Do not expose the converter to rain or moisture.**
- **Never attempt to bypass fuses. Always replace defective fuses with ones of the specified type and rating.**
- **Refer any service operation not described in this manual to a qualified technician.**
- **Do not modify the converter or install other than genuine Martin parts.**

SETUP

Unpacking

The 516-II DMX to 0-10 V Converter comes with the following items. Please check the contents and verify that nothing is missing or damaged.

- 516-II DMX to 0-10 V Converter
- 5 meter 3-pin XLR data cable
- this user manual

Operating modes

OPERATING MODE OPTIONS

The 516-II DMX to 0-10 V Converter has 2 DMX modes and 1 Martin mode.

In **DMX mode 1** the 516-II DMX to 0-10 V Converter performs as an analog dimmer, converting 8-bit digital levels to voltages between 0 an 10 V. The converter requires 16 DMX channels - 1 per output - in this mode.

In **DMX mode 2** the 516-II DMX to 0-10 V Converter performs as a switch pack, toggling devices on and off, by converting DMX signals to 0 or 10 V. The converter requires just 2 DMX channels in mode 2 - each bit controls one output channel.

In **Martin mode** the 516-II DMX to 0-10 V Converter performs as an analog dimmer, as in DMX mode 1, but is for use with Martin RS-485 controllers such as the 3032 and the 2308. The converter requires 1 Martin channel.

DMX MODE SETUP

The converter automatically switches to the selected DMX mode when used with DMX controllers. The factory default is DMX mode 1, the dimmer mode. To change DMX mode,

1. **Disconnect the converter from power. Remove the top cover, which is secured by 1 screw on each end and 3 screws on the back.**
2. **Locate the jumper at PL113 on the small circuit board.**
3. **To select DMX mode 2, place the jumper on pins 1 and 2. Pin 1 is marked and is closest to the front panel. To select DMX mode 1, remove the jumper and store it by placing on pin 1 only.**
4. **Replace the top cover before applying power.**

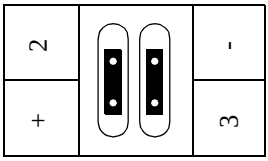
MARTIN MODE SETUP

The converter automatically switches to Martin mode when used with Martin protocol controllers. You may wish to swap the polarity of the serial data link connectors as described below so they have the same pin-out as the controller.

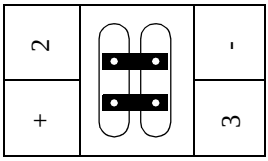
XLR pin-out

The converter's serial data link sockets are factory set to the DMX pin-out. For use with Martin protocol controllers, you can either switch the pin-out or use a phase-reversing cable between the controller and the converter.

1. **Disconnect the converter from power. Remove the top cover, which is secured by 1 screw on each end and 3 screws on the back.**
2. **Locate the jumpers at PL112 on the small circuit board.**
3. **Position the jumpers as shown below for the desired pin-out.**
4. **Replace the top cover before applying power.**



Martin pin-out



DMX pin-out

AC power

Warning! ***For protection from electric shock, the converter must be grounded (earthed). The AC mains supply shall have overload and ground-fault protection.***

CHECK VOLTAGE SETTING

Before use verify that the converter's power supply is correctly set for the local AC voltage.

- **Locate the 115/230 V selector switch on the back. Select the voltage that most closely matches your AC supply.**

INSTALL A PLUG ON THE MAINS LEAD

The converter's mains lead must be fitted with a grounding-type cord cap that fits your power distribution cable or outlet. Consult a qualified electrician if you have any doubts about proper installation.

- **Following the cord cap manufacturer's instructions, connect the yellow and green wire to ground (earth), the brown wire to live, and the blue wire to neutral. The table below shows some pin identification schemes.**

Wire	Pin	Marking	Screw color
brown	live	"L"	yellow or brass
blue	neutral	"N"	silver
yellow/green	ground	⏚	green

Placement

The 516-II DMX to 0-10 V Converter fits into a 2U 19" rack mount. Alternatively, you can place the converter on its rubber feet.

Analog device connection

The 516-II DMX to 0-10 V Converter has 16 outputs for connecting 0-10 V analog devices. Each output is connected to both a 5-pin DIN socket and the 25-pin D-SUB socket: use the connector that fits your equipment. Devices may be connected in parallel, using both types of connectors, for paired control of up to 32 devices. The pin number of each output is shown on the rear panel.

Connections can be tested without a controller by setting all pins on the converter's DIP-switch to the off position and then applying power to the converter and the devices. The 516-II DMX to 0-10 V Converter applies 10 volts to each output in a chase sequence.

Controller connection

The converters's serial data link sockets are wired pin 1 to ground, pin 2 to signal - (cold), and pin 3 to signal + (hot). They are compatible with DMX devices. For compatibility with Martin RS-485 devices, pins 2 and 3 can be swapped. See "XLR pin-out" on page 5.

1. **For DMX operation, connect a data cable (included) to the controller's data output. If controller has a 5-pin output, use a 5-pin male to 3-pin female adaptor cable (P/N 11820005).**
2. **For Martin operation, either (1) connect a phase-reversing cable (P/N 11820006) to the controller's data output, or (2) connect a regular cable and swap the polarity of the converter's XLR connectors.**
3. **Lead the data cable from the controller to the 516-II DMX to 0-10 V Converter. Plug the cable into the serial data link In socket.**
4. **Connect any additional converters or digitally-controlled fixtures output to input (daisy-chain). When connecting 2 fixtures with reversed polarity, insert**

a phase-reversing cable between them. Up to 32 devices may be connected on a serial link.

5 **Terminate the link by inserting a male termination plug (P/N 91613017) into the data output of the last device. A termination plug is simply an XLR connector with a 120 ohm, 0.25 W resistor soldered across pins 2 and 3.**

Male Termination Plug	5-pin to 3-pin Adaptor	3-pin to 5-pin Adaptor	3-pin to 3-pin Phase-Reversing Adaptor
Male XLR 1 2 ⌇ 120 3	Male Female 1 — 1 2 — 2 3 — 3 4 5	Male Female 1 — 1 2 — 2 3 — 3 4 5	Male Female 1 — 1 2 ✕ 2 3 ✕ 3
P/N 91613017	P/N 11820005	P/N 11820004	P/N 11820006

Address selection

A control address must be set using the DIP-switch on the rear panel. The control address, also known as the start channel, is the first channel used to receive instructions from the controller.

Each converter must be assigned its own address and non-overlapping control channels for individual control. The 516-II DMX to 0-10 V Converter uses 2 or 16 DMX channels, depending on mode, or 1 Martin channel.

1 **Disconnect the converter from AC power.**

2 **Select an address for the converter on your controller. The highest allowable address is 497 in DMX mode 1, 511 in DMX mode 2, and 32 in Martin mode.**

3 **Look up the DIP-switch setting for the address on page 8.**

4 **Set pins 1 through 10 to the ON (1) or OFF (0) position as listed in the table.**

DIP-SWITCH ADDRESS TABLE

Find the address in the table below. Read the settings for pins 1 - 5 to the left and read the settings for pins 6 - 10 above the address. “0” means OFF and “1” means ON. Pin 10 is always off.

DIP-Switch Setting 0 = OFF 1 = ON					#10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
					#9	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
					#8	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
					#7	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
					#6	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
#1	#2	#3	#4	#5																	
0	0	0	0	0		32	64	96	128	160	192	224	256	288	320	352	384	416	448	480	
1	0	0	0	0	1	33	65	97	129	161	193	225	257	289	321	353	385	417	449	481	
0	1	0	0	0	2	34	66	98	130	162	194	226	258	290	322	354	386	418	450	482	
1	1	0	0	0	3	35	67	99	131	163	195	227	259	291	323	355	387	419	451	483	
0	0	1	0	0	4	36	68	100	132	164	196	228	260	292	324	356	388	420	452	484	
1	0	1	0	0	5	37	69	101	133	165	197	229	261	293	325	357	389	421	453	485	
0	1	1	0	0	6	38	70	102	134	166	198	230	262	294	326	358	390	422	454	486	
1	1	1	0	0	7	39	71	103	135	167	199	231	263	295	327	359	391	423	455	487	
0	0	0	1	0	8	40	72	104	136	168	200	232	264	296	328	360	392	424	456	488	
1	0	0	1	0	9	41	73	105	137	169	201	233	265	297	329	361	393	425	457	489	
0	1	0	1	0	10	42	74	106	138	170	202	234	266	298	330	362	394	426	458	490	
1	1	0	1	0	11	43	75	107	139	171	203	235	267	299	331	363	395	427	459	491	
0	0	1	1	0	12	44	76	108	140	172	204	236	268	300	332	364	396	428	460	492	
1	0	1	1	0	13	45	77	109	141	173	205	237	269	301	333	365	397	429	461	493	
0	1	1	1	0	14	46	78	110	142	174	206	238	270	302	334	366	398	430	462	494	
1	1	1	1	0	15	47	79	111	143	175	207	239	271	303	335	367	399	431	463	495	
0	0	0	0	1	16	48	80	112	144	176	208	240	272	304	336	368	400	432	464	496	
1	0	0	0	1	17	49	81	113	145	177	209	241	273	305	337	369	401	433	465	497	
0	1	0	0	1	18	50	82	114	146	178	210	242	274	306	338	370	402	434	466	498	
1	1	0	0	1	19	51	83	115	147	179	211	243	275	307	339	371	403	435	467	499	
0	0	1	0	1	20	52	84	116	148	180	212	244	276	308	340	372	404	436	468	500	
1	0	1	0	1	21	53	85	117	149	181	213	245	277	309	341	373	405	437	469	501	
0	1	1	0	1	22	54	86	118	150	182	214	246	278	310	342	374	406	438	470	502	
1	1	1	0	1	23	55	87	119	151	183	215	247	279	311	343	375	407	439	471	503	
0	0	0	1	1	24	56	88	120	152	184	216	248	280	312	344	376	408	440	472	504	
1	0	0	1	1	25	57	89	121	153	185	217	249	281	313	345	377	409	441	473	505	
0	1	0	1	1	26	58	90	122	154	186	218	250	282	314	346	378	410	442	474	506	
1	1	0	1	1	27	59	91	123	155	187	219	251	283	315	347	379	411	443	475	507	
0	0	1	1	1	28	60	92	124	156	188	220	252	284	316	348	380	412	444	476	508	
1	0	1	1	1	29	61	93	125	157	189	221	253	285	317	349	381	413	445	477	509	
0	1	1	1	1	30	62	94	126	158	190	222	254	286	318	350	382	414	446	478	510	
1	1	1	1	1	31	63	95	127	159	191	223	255	287	319	351	383	415	447	479	511	

OPERATION

The 516-II DMX to 0-10 V Converter is ready to operate when

- the DMX mode is selected,
- the voltage setting (115/230 V) is correct,
- a plug has been installed on the power cable and the power cable is plugged in,
- the controller and analog devices are connected and plugged in,
- the control address is set on the DIP-switch.

Martin mode operation

1 **Flip the power switch on the front panel of the converter to ON. Apply power to the controller and the analog devices.**

2 **Set levels for the analog devices as described in the controller user manual.**

DMX dimmer operation

1 **Flip the power switch on the front panel of the converter to ON. Apply power to the controller and the analog devices.**

2 **Set levels for the analog devices by accessing the converter on the DMX controller and setting the corresponding channels between 0 and 255. The relationship between voltage and DMX level is shown below: values are approximate.**

DMX switch pack operation

1 **Turn on the converter, controller, and analog devices.**

2 **Toggle devices 1 - 8 on/off by setting channel 1 as shown below. For example, to turn devices 1, 2, 3, 4 on and devices 5, 6, 7, 8 off, set channel 1 to 240.**

3 **Similarly, use channel 2 to control devices 9 - 16.**

DMX Mode 2
Channel 1
• = On

8		•		•		•		•		•		•		•		•
7			•	•			•	•			•	•			•	•
6					•	•	•	•					•	•	•	•
5									•	•	•	•	•	•	•	•

1	2	3	4	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			•	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
		•		32	33	34	35	35	37	38	39	40	41	42	43	44	45	46	47
		•	•	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
	•			64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
	•		•	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
	•	•		96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
	•	•	•	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
•				128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
•			•	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
•		•		160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
•		•	•	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
•	•			192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
•	•		•	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
•	•	•		224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
•	•	•	•	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

DMX Mode 2
Channel 2
• = On

16		•		•		•		•		•		•		•		•
15			•	•			•	•			•	•			•	•
14					•	•	•	•					•	•	•	•
13									•	•	•	•	•	•	•	•

9	10	11	12	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			•	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
		•		32	33	34	35	35	37	38	39	40	41	42	43	44	45	46	47
		•	•	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
	•			64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
	•		•	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
	•	•		96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
	•	•	•	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
•				128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
•			•	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
•		•		160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
•		•	•	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
•	•			192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
•	•		•	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
•	•	•		224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
•	•	•	•	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

SPECIFICATIONS

DIMENSIONS

Length . . . . . 482 mm (19.0 in)
Width . . . . . 125 mm (4.9 in)
Height . . . . . 89 mm (3.5 in)
Weight . . . . . 2.8 kg (6.1 lb)

ELECTRICAL

Power supply settings . . . . . .115/230 V, switch selectable
AC frequency . . . . . 50 - 60 Hz
Power consumption . . . . . 10 W
Primary fuse . . . . . T 125 mA, 250 V, 5 x 20 mm
Secondary fuse . . . . . T 2 A, 250 V, 5 x 20 mm

CONSTRUCTION

Housing . . . . . .steel
Finish . . . . . .black, electrostatic powder coating

CONNECTIONS

Serial data in . . . . . 3-pin XLR male, pins 2 and 3 switchable
Serial data out . . . . . 3-pin XLR female, pins 2 and 3 switchable
Analog output . . . . . .5-pin DIN female, 25-pin DSUB male