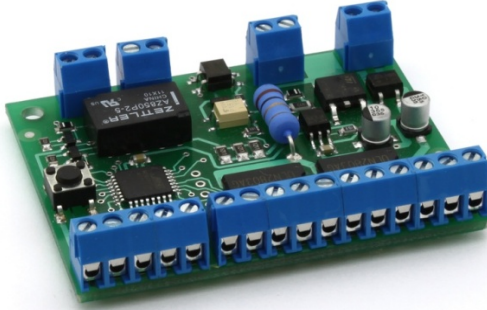


TM-74433



TRAINMODULES



Signal decoder

User's manual



5 998975 300766



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Safety warning

During the operation of the device the specified technical parameters shall always be met. At the installation the environment shall be fully taken into consideration. The device must not be exposed to moisture and direct sunshine.

A soldering tool may be necessary for the installation and/or mounting of the devices, which requires special care.

During the installation it shall be ensured that the bottom of the device should not contact with a conductive (e.g. metal) surface!

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Properties

- Handling the signalling system of several countries
- External control possibility
- Train manipulation
- Smooth light changing (bulb simulation)
- Optional separate supply
- Quick programming possibility
- Detailed DCC CV programming
- Handling of one or more signals
- Low idle mode current consumption

Technical parameters

Supply voltage: 7-24V

Idle mode current consumption: 20 mA

Max. current consumption: 80 mA

Dimensions: 58x47 mm

Short description

The module serves for controlling the light signals. The decoder recognizes the signalling system of several countries whereby always the appropriate view will appear on the light signals connected to the decoder.

It is provided with inputs and outputs capable of manipulating trains.

If also the external control inputs are used, an automatic wagon distance control system can be achieved as well.

Wiring

The supply voltage is connected to the **"POWER"** terminals.

The rail signal of the digital system is connected to the **"DCC IN"** terminals (Figure 1a)

The light signal is connected to the Q1-Q8 outputs (depending on the signal and the country).

If we do not wish to use external supply for the module, the **"POWER"** and **"DCC IN"** terminals can be commoned (Figure 1b).

Automatic train manipulation

The automatic train manipulation is the integrated part of each light signal decoder; it requires no external device at all.

RAIL OUT: This output is for supplying the rail block in front of the signal.

BREAK IN: The output of the brake control device is connected to this input (Figure 2).

Leave the "BREAK IN" terminals empty if no brake control device is available. In this case, when the light signal stops the engine, the block in front of the signal gets into voltage-free condition (the engine stops immediately).

The following inputs can be used for train manipulation:

RED: Light signal to red. When the input is activated, the light signal changes to red; in case also the BRK input is active, the rail block preceding the active light signal will be supplied by the brake control device (the engine stops).

GRN: Light signal to manual free. The status of the "NRED" and "NBOD" inputs influences the free signal.

BRK: Sensing of engine along the block – change-over of block supply

NRED: Input for the feedback of the red status of the next signal. It influences the free signal view of the signal.

NBOD: Input for the feedback of the occupation of the next block. It influences the free signal view of the signal.

Modifying the signal view

The status of the NRED and NBOD inputs modifies in each case the actual signal view when the free signal is sent. The rules are as follows:

Required signal	NRED	NBOD	Signal sent out
Free	False	False	Free
Free	True	False	Limited speed. Next signal expected red (e.g. max. 40km/h)
Free	False	True	Stop (the next block is occupied)
Free	True	True	Stop (the next block is occupied, the next signal is red)
Stop	-	-	Stop

If the status of the NRED and NBOD changes, the signal view sent out change as well.

Examples for a sequence:

Free signal is required. The next block is occupied (NBOD is true), the signal sent out is Stop. When the block is released (NBOD is false), the signal sent out automatically resets to the required signal.

Free signal is required. The next signal is expected to be red (NRED is true), the signal sent out is Limited speed. When the next signal changes to free (NRED is false), the signal sent out changes to free as well.

Programming

Quick programming is applicable as follows:

1. Press shortly the "PROG" button
2. The blinking of the LED indicates that the entering into the programming mode was successful
3. On the digital centre, set the starting address of the required signal (multiple of 4, see Table 1)
4. Send the change command from the digital centre
5. The dark status of the LED indicates that the address is accepted.

Thereafter the signal decoder will accept commands on 4 addresses following the starting address; each required signal view can be set by means of these four addresses.

Another procedure is the DirectCV programming mode supported by any digital centre.

The CV programming mode is suitable also for the selection of the signalling system of a given country.

* CV = Configuration Variable

Steps of CV programming:

1. Connect the "DCC IN" input of the decoder to the digital centre output for programming rail
2. Switch on the decoder power supply
3. Enter into the Programming menu of the digital centre
4. Select the Direct CV - Byte programming mode
5. Enter the CV number of the setting to be modified (e.g. 1)
6. Confirm the entered number then enter the new CV value as well (e.g. 190)
7. After the confirmation of the value the digital centre performs the programming.

The programming process can be different depending on the digital centres; thus always study the user's manual of the given digital centre.

Address programming by CVs

For example: desired address is 1045. This address consists of two CVs.

Desired address divided by 256:

$$1045 / 256 = 4 \text{ remainder } 21$$

$$\text{CV1} = 4$$

$$\text{CV9} = 21$$

Table of decoder CVs

CV	Description	Range	Default value
1	Address LSB	1-255	1
7	Version	-	-
8	Mfg. ID / Reset*	-	61
9	Address MSB	0-7	0
112	Country code 0 = Universal** 1 = Hungarian 2 = German 3 = Dutch 4 = Belgian		
113	Light signal type (see- table of types)		0

* CV8 = 8 restore factory defaults

** 4 pcs 2 aspects light signal

Light signal type table (CV 113)

CV112	CV113
0	0 = 4 pcs 2 aspects light signal
1	0 = 4 aspects light signal 1 = 3 aspects section light signal 2 = 2 aspects light signal 3 = 4 aspects repeat-signal
2	0 = Hp0, Hp1, Hp2 and Vr0, Vr1, Vr2 1 = Hp0, Hp1, Hp2, Sh1, Vr0, Vr1, Vr2
3	0 = 3+1 aspects light signal
4	0 = 4 aspects light signal

Guarantee and legal statement

Each parameter of the device was submitted to comprehensive testing prior to marketing. The manufacturer undertakes one year guarantee for the product. Defects occurred during this period will be repaired by the manufacturer free of charge against the presentation of the invoice.

The validity of the guarantee will cease in case of improper usage and/or treatment.

Attention! By virtue of the European EMC directive the product can be used solely with devices provided with CE marking.

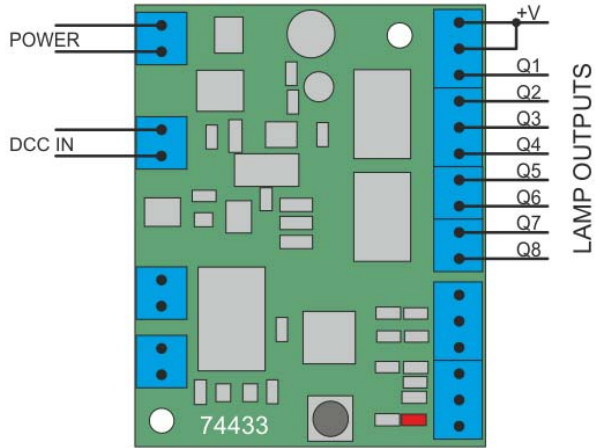
The mentioned standards and branch names are the trademarks of the firms concerned.

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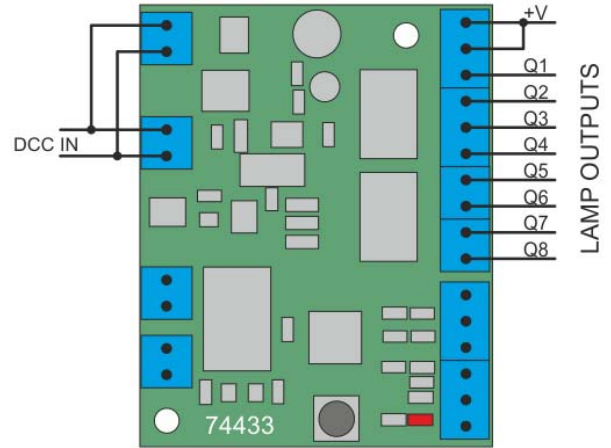
Made in Hungary.

Tel.: +36 1 46-707-64
<http://www.trainmodules.hu/>

Figure 1: Connections of the signal decoder



a) In case of external supply



b) In case of common supply

Figure 2: Wiring of the signal decoder with train manipulation

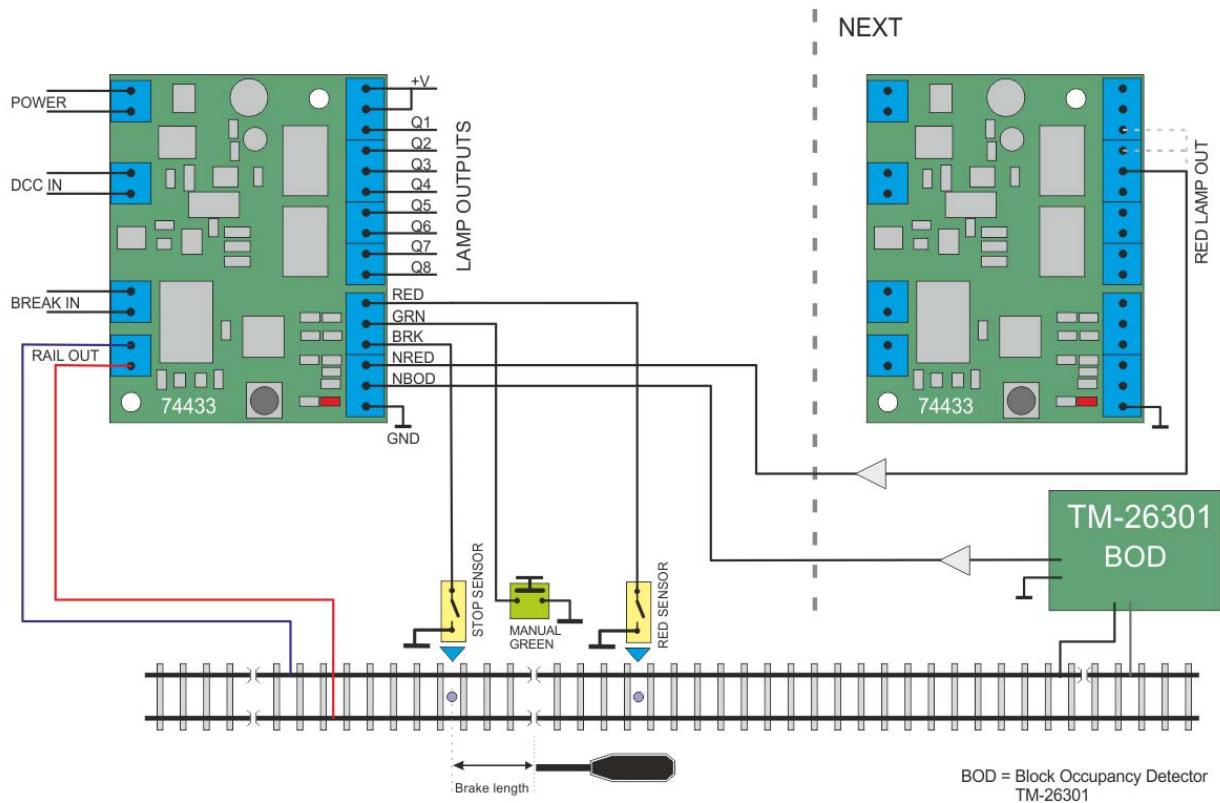
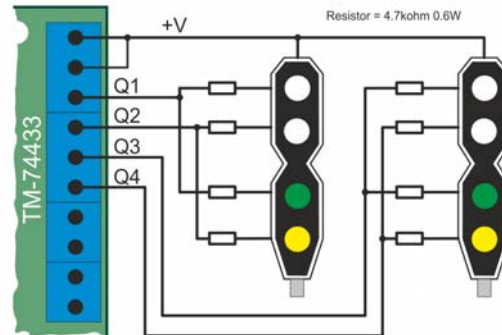
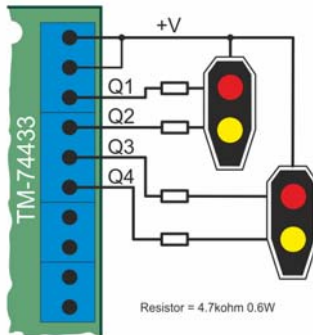
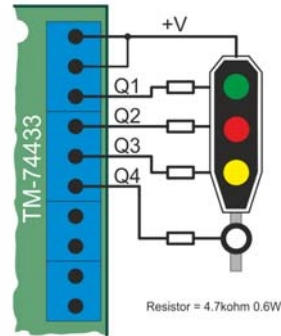
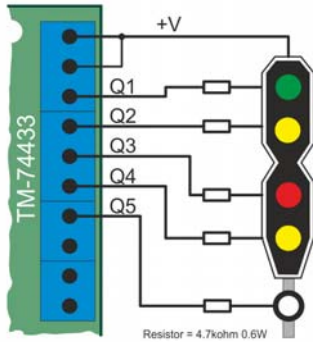
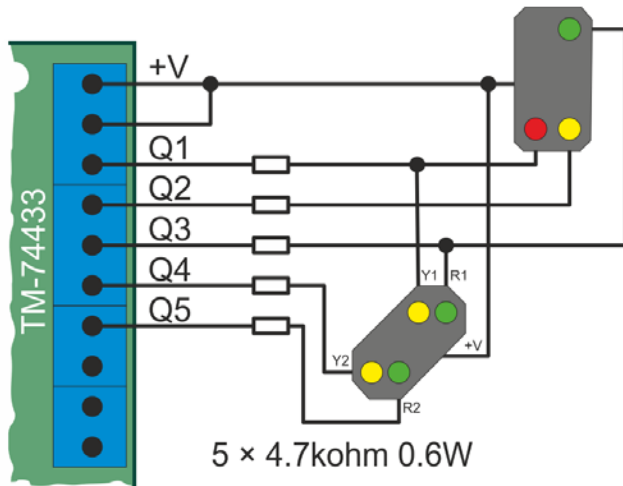


Figure 3: Wiring of Hungarian signals

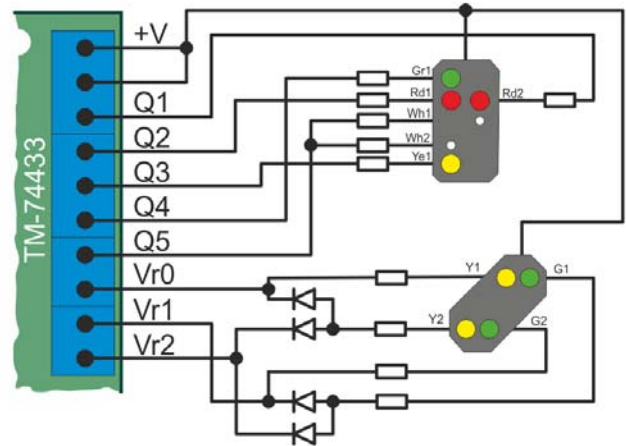


* Resistors: 4,7 KOhm 0,6W

Figure 4: Wiring of German signals



Hp and Vr



Hp, Sh and Vr

Figure 5: Wiring of Dutch signals

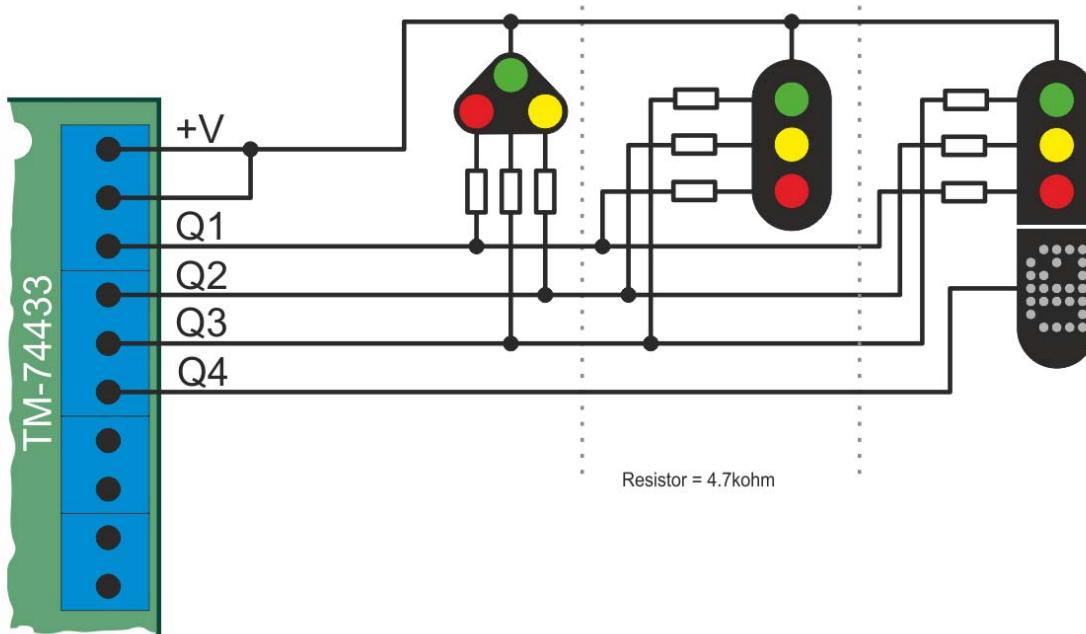


Figure 6: Wiring of Belgian signals

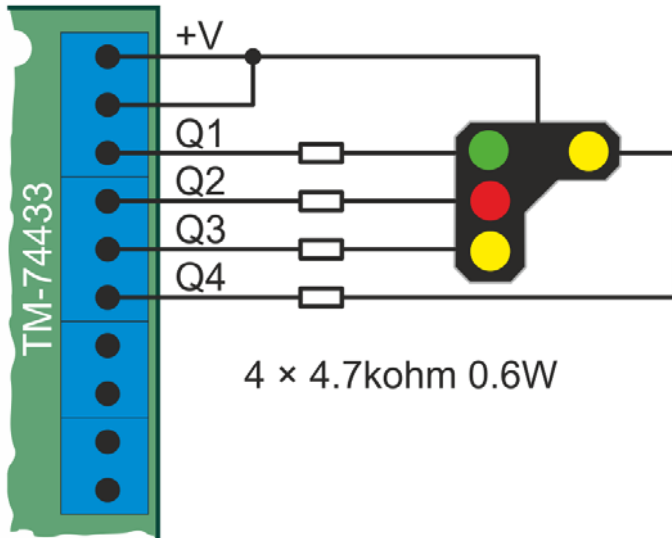


Table 1: Starting addresses at grouping by 4

1	101	201	301	401	501	601	701	801	901
5	105	205	305	405	505	605	705	805	905
9	109	209	309	409	509	609	709	809	909
13	113	213	313	413	513	613	713	813	913
17	117	217	317	417	517	617	717	817	917
21	121	221	321	421	521	621	721	821	921
25	125	225	325	425	525	625	725	825	925
29	129	229	329	429	529	629	729	829	929
33	133	233	333	433	533	633	733	833	933
37	137	237	337	437	537	637	737	837	937
41	141	241	341	441	541	641	741	841	941
45	145	245	345	445	545	645	745	845	945
49	149	249	349	449	549	649	749	849	949
53	153	253	353	453	553	653	753	853	953
57	157	257	357	457	557	657	757	857	957
61	161	261	361	461	561	661	761	861	961
65	165	265	365	465	565	665	765	865	965
69	169	269	369	469	569	669	769	869	969
73	173	273	373	473	573	673	773	873	973
77	177	277	377	477	577	677	777	877	977
81	181	281	381	481	581	681	781	881	981
85	185	285	385	485	585	685	785	885	985
89	189	289	389	489	589	689	789	889	989
93	193	293	393	493	593	693	793	893	993
97	197	297	397	497	597	697	797	897	997

1001	1101	1201	1301	1401	1501	1601	1701	1801	1901	2001
1005	1105	1205	1305	1405	1505	1605	1705	1805	1905	2005
1009	1109	1209	1309	1409	1509	1609	1709	1809	1909	2009
1013	1113	1213	1313	1413	1513	1613	1713	1813	1913	2013
1017	1117	1217	1317	1417	1517	1617	1717	1817	1917	2017
1021	1121	1221	1321	1421	1521	1621	1721	1821	1921	2021
1025	1125	1225	1325	1425	1525	1625	1725	1825	1925	2025
1029	1129	1229	1329	1429	1529	1629	1729	1829	1929	2029
1033	1133	1233	1333	1433	1533	1633	1733	1833	1933	2033
1037	1137	1237	1337	1437	1537	1637	1737	1837	1937	2037
1041	1141	1241	1341	1441	1541	1641	1741	1841	1941	2041
1045	1145	1245	1345	1445	1545	1645	1745	1845	1945	
1049	1149	1249	1349	1449	1549	1649	1749	1849	1949	
1053	1153	1253	1353	1453	1553	1653	1753	1853	1953	
1057	1157	1257	1357	1457	1557	1657	1757	1857	1957	
1061	1161	1261	1361	1461	1561	1661	1761	1861	1961	
1065	1165	1265	1365	1465	1565	1665	1765	1865	1965	
1069	1169	1269	1369	1469	1569	1669	1769	1869	1969	
1073	1173	1273	1373	1473	1573	1673	1773	1873	1973	
1077	1177	1277	1377	1477	1577	1677	1777	1877	1977	
1081	1181	1281	1381	1481	1581	1681	1781	1881	1981	
1085	1185	1285	1385	1485	1585	1685	1785	1885	1985	
1089	1189	1289	1389	1489	1589	1689	1789	1889	1989	
1093	1193	1293	1393	1493	1593	1693	1793	1893	1993	
1097	1197	1297	1397	1497	1597	1697	1797	1897	1997	