MXTAP - The Missing Manual

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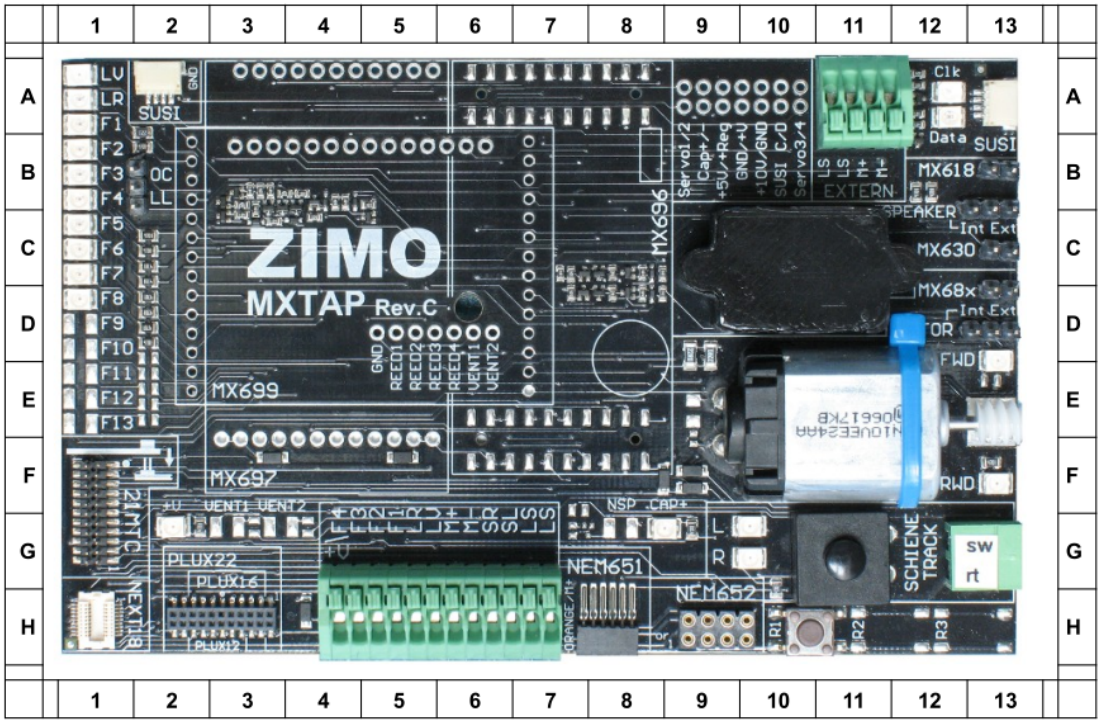
Some additional usage information about ZIMOs decodertester MXTAP.

1 Contents

2 Reference



Layout of MXTAP with locations (MXTAP-Layout.pdf)

2.1 Connectors

Reference	Pin	Location	Description
SUSI		A,2	Zugbus / SUSI
Servo1		A,9	???
Servo2		A,9	???
Cap+		A,9	???
Cap–		A,9	???
GND		A,10	Betriebsspannung Minus (Gemeinsamer Leiter für Funktionen)
+V		A,10	Betriebsspannung Plus (Gemeinsamer Leiter für Funktionen)
+10V		A,10	???
GND		A,10	Betriebsspannung Minus (Gemeinsamer Leiter für Funktionen)
SUSI C		A,10	Zugbus Takt / SUSI Clock
SUSI D		A,10	Zugbus Daten / SUSI Data
Servo3		A,10	???
Servo4		A,10	???
EXTERN	LS	A,11	Externer Lautsprecher
EXTERN	LS	A,11	Externer Lautsprecher
EXTERN	M+	A,11	Externer Motor Plus
EXTERN	M–	A,11	Externer Motor Minus
SUSI		A,13	Zugbus / SUSI
21MTC		FG,1	Decoder (21MTC Plug)
SCHIENE TRACK		G,13	Programmer or Central Station
NEXT18		H,13	Decoder (NEXT18 or NEXT18–S Plug)
PLUX22 PLUX16 PLUX12		H,2–3	Decoder (PLUX22, PLUX16 or PLUX12 Plug)
F4 \ +V		H,4	Decoder (wire) Betriebsspannung Plus or AUX4
F3		H,5	Decoder (wire) AUX3 Output
F2		H,5	Decoder (wire) AUX2 Output
F1		H,5	Decoder (wire) AUX1 Output
LR		H,5	Decoder (wire) F0r Output
LV		H,6	Decoder (wire) F0f Output
M+		H,6	Decoder (wire) Motor Plus
M–		H,6	Decoder (wire) Motor Minus
SR		H,6	Decoder (wire) Schiene rechts

Reference	Pin	Location	Description
SL		H,7	Decoder (wire) Schiene links
LS		H,7	Decoder (wire) Lautsprecher
LS		H,7	Decoder (wire) Lautsprecher
NEM651		H,7–8	Decoder (NEM651 Plug)
NEM652		H,9–10	Decoder (NEM652 Plug)

Connectors

2.2 Jumpers

Reference	Location	Setting	Description
OC/LL	B,2	OC	AUX3 and AUX4 are open collector outputs (eg. Plux22 decoders)
OC/LL	B,2	LL	AUX3 and AUX4 are logic level outputs (eg. some 21MTC decoders)
MX618	B,13	open	???
MX618	B,13	closed	??? Enable driver for logic level outputs AUX5 and AUX6 for Next18 decoders
Speaker	C,13	open	No Speaker is used (eg. Next18 decoders)
Speaker	C,13	Int.	Internal Speaker is used
Speaker	C,13	Ext.	External Speaker (connected to LS, LS) is used
MX630	C,13	open	???
MX630	B,13	closed	???
MX68x	C,13	open	???
MX68x	B,13	closed	???
Motor	D,13	open	No Motor is used
Motor	D,13	Int.	Internal Motor is used
Motor	D,13	Ext.	External Motor (connected to M+, M–) is used

Jumpers

2.3 Buttons

Reference	Location	Description
	G,11	Power on/off (disconnects SCHIENE TRACK)

Buttons

2.4 LEDs

Reference	Location	Description
LV	A,1	Function F0f is activated
LR	A,1	Function F0r is activated
F1	A,1	Function AUX1 is activated
F2	B,1	Function AUX2 is activated
F3	B,1	Function AUX3 is activated
F4	B,1	Function AUX4 is activated
F5	C,1	Function AUX5 is activated
F6	C,1	Function AUX6 is activated
F7	C,1	Function AUX7 is activated
F8	D,1	Function AUX8 is activated
+V	G,2	Betriebspannung Plus connected (eg. NEM652 decoder)
CAP+	G,8	???
L	G,10	Power from SCHIENE TRACK applied (links is positive)
R	G,10	Power from SCHIENE TRACK applied (rechts is positive)
Clk	A,12	Zugbus Takt / SUSI C aktivity or AUX3 Output
Data	A,12	Zugbus Daten / SUSI D aktivity or AUX4 Output
FWD	E,13	Motor driven in forward direction
RWD	F,13	Motor driven in reverse direction

LEDs

3 Testing a Decoder with NEM652 Connector

The section shows how to test a decoder with NEM652 plug. A ESU LokPilot DCC V4.0 (order number 54611) with all CVs set to default is used in the section as example.

3.1 Connections

1. **SCHIENE TRACK** Programming Track Output of Programmer or Central Station
2. **NEM652** to Decoder under test.

Connect green wire to **F1** (when green wire is available and not connected to NEM652 plug).

Connect violet wire to **F2** (when existing).

Connect speaker wires to **LS** and **LS** (when existing).

Leave all other connectors open (empty).

3.2 Jumper

1. **OC/LL** to **OC**
2. **MX618** to open
3. **SPEAKER** to **Int**
4. **MX630** to open
5. **MX68x** to open
6. **MOTOR** to **Int**

3.3 Testing

Start Programming Software (JMRI for Example).

Press Button on MXTAP until Leds **L** and **R** lights up.

First try to identify decoder or read some CVs.

Open Throttle.

1. Changing speed and direction on throttle should be reflected by the **MOTOR** and Leds **FWD** and **RWD**.
2. Led **+V** should be illuminated.
3. Pressing button F0 on throttle should control one of Leds **LV** or **LR**. Changing the direction should toggle between **LV** (forward direction) and **LR** (backward direction).
4. Button F1 on throttle should control Led **F1** (when green wire is available on decoder)
5. Button F2 on throttle should control Led **F2** (when violet wire is available on decoder)

6. Speaker should play sound (when the decoder has a speaker output)

For more details see:

Equivalent circuit diagram (MXTAP-NEM652.pdf)

4 Testing a Decoder with NEM651 Connector

The section shows how to test a decoder with NEM651 plug. A ESU LokPilot micro DCC V4.0 (order number 54684) with all CVs set to default is used in the section as example.

4.1 Connections

1. **SCHIENE TRACK** Programming Track Output of Programmer or Central Station
2. **NEM651** to Decoder under test.

Connect green wire to **F1** (when existing).

Connect violet wire to **F2** (when existing).

Connect speaker wires to **LS** and **LS** (when existing).

Leave all other connectors open (empty).

4.2 Jumper

1. **OC/LL** to **OC**
2. **MX618** to open
3. **SPEAKER** to **Int**
4. **MX630** to open
5. **MX68x** to open
6. **MOTOR** to **Int**

4.3 Testing

Start Programming Software (JMRI for Example).

Press Button on MXTAP until Leds **L** and **R** lights up.

First try to identify decoder or read some CVs.

Open Throttle.

1. Changing speed and direction on throttle should be reflected by the **MOTOR** and Leds **FWD** and **RWD**.
2. **+V** will *not* be illuminated.
3. Pressing button F0 on throttle should control one of Leds **LV** or **LR**. Changing the direction should toggle between **LV** (forward direction) and **LR** (backward direction).
4. Button F1 on throttle should control Led **F1** (when green wire is available on decoder)
5. Button F2 on throttle should control Led **F2** (when violet wire is available on decoder)

6. Speaker should play sound (when the decoder has a speaker output)

For more details see:

Equivalent circuit diagram (MXTAP-NEM651.pdf)

5 Testing a Decoder with wires (without connector)

This sections shows how to test a decoder without connector (only wires). A ZIMO MX617 is used in the section as example. Note that the MX617 uses a brown wire instead of violet for function output 2.

5.1 Connections

1. **SCHIENE TRACK** Programming Track Output of Programmer or Central Station
2. Connect wires from Decoder under test to connector as follows:

Conn.	Wire Color (NEM)	Wire Color (NMRA)	Color	Function
+V \ F4	Blau	Blue		Betriebsspannung Plus (Gemeinsamer Leiter für Funktionen)
F3	–	–	–	AUX 3 (Funktionsausgang)
F2	Violett	–		AUX 2 (Funktionsausgang)
F1	Grün	–		AUX 1 (Funktionsausgang)
LR	Gelb	Yellow		Licht hinten (Funktionsausgang)
LV	Weiß	White		Licht vorne (Funktionsausgang)
M+	Orange	Orange		Motor Plus
M−	Grau	Gray		Motor Minus
SR	Rot	Red		Schiene rechts
SL	Schwarz	Black		Schiene links
LS	Braun	–		Lautsprecher
LS	Braun	–		Lautsprecher

Connections of decoders with wires

Leave all other connectors open (empty).

5.2 Jumper

1. **OC/LL** to **OC**
2. **MX618** to open
3. **SPEAKER** to **Int**
4. **MX630** to open
5. **MX68x** to open
6. **MOTOR** to **Int**

5.3 Testing

Start Programming Software (JMRI for Example).

Press Button on MXTAP until Leds **L** and **R** lights up.

First try to identify decoder or read some CVs.

Open Throttle.

1. Changing speed and direction on throttle should be reflected by the **MOTOR** and Leds **FWD** and **RWD**.
2. Led **+V** will *not* be illuminated.
3. Pressing button F0 on throttle should control one of Leds **LV** or **LR**. Changing the direction should toggle between **LV** (forward direction) and **LR** (backward direction).
4. Button F1 on throttle should control Led **F1** (when green wire is available on decoder)
5. Button F2 on throttle should control Led **F2** (when violet wire is available on decoder)
6. Speaker should play sound (when the decoder has a speaker output)

For more details see:

Equivalent circuit diagram (MXTAP-Wire.pdf)

6 Testing a Decoder with Next18 connector

This section shows how to test a decoder with Next18 (no Next18-S) connector. See RCN-118 (http://normen.railcommunity.de/RCN-118.pdf) for details. A ZIMO MX618N18 with all CVs set to default (expect CV #124 where Bit 7 is set to 1 "Logik-Pegel anstelle SUSI aktiviert") is used as example.

6.1 Connections

1. **SCHIENE TRACK** Programming Track Output of Programmer or Central Station
2. Plug decoder under test in **NEXT18**.

6.2 Jumper

1. **OC/LL** to **LL**
2. **MX618** to closed
3. **SPEAKER** to open
4. **MX630** to open
5. **MX68x** to open
6. **MOTOR** to **Int**

6.3 Testing

Start Programming Software (JMRI for Example).

Press Button on MXTAP until Leds **L** and **R** lights up.

First try to identify decoder or read some CVs.

Open Throttle.

1. Changing speed and direction on throttle should be reflected by the **MOTOR** and Leds **FWD** and **RWD**.
2. Led **+V** should be illuminated.
3. Pressing button F0 on throttle should control one of Leds **LV** or **LR**. Changing the direction should toggle between **LV** (forward direction) and **LR** (backward direction).
4. Button F1 on throttle should control Led **F1**.
5. Button F2 on throttle should control Led **F2**.
6. Button F3 on throttle should control Led **Clk**. [1]
7. Button F4 on throttle should control Led **Data**. [2]

1 This requires that SUSI/Zugbus is diabled. On Zimo MX618N18 CV #127 Bit 7 should be set to 1
2 This requires that SUSI/Zugbus is diabled. On Zimo MX618N18 CV #127 Bit 7 should be set to 1

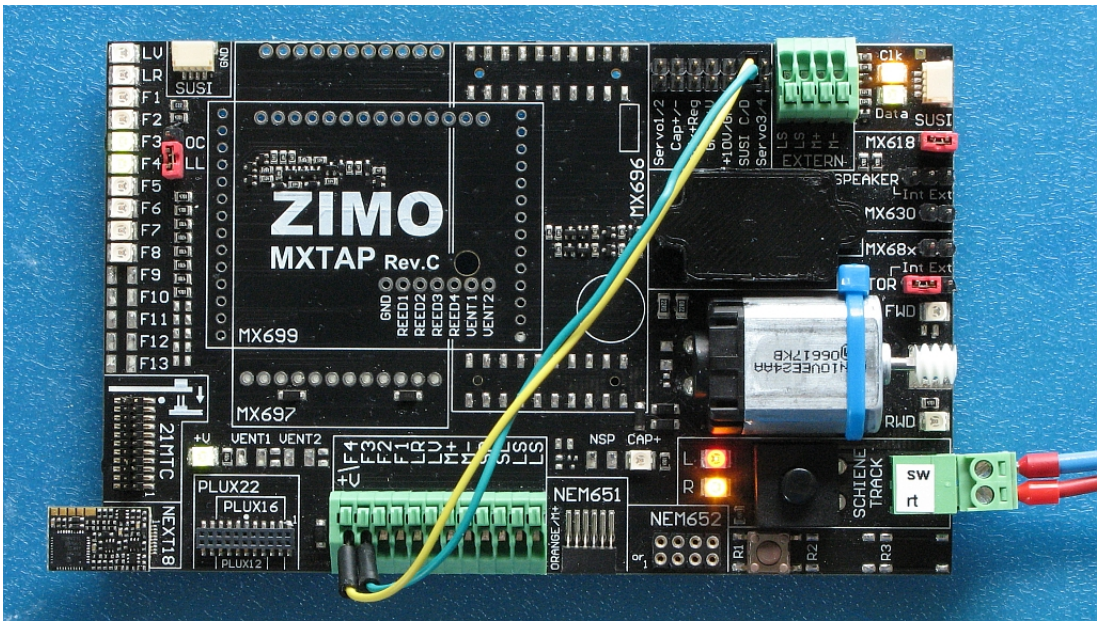
8. Button F5 on throttle should control Led **F5** (when decoder supports F5).
9. Button F6 on throttle should control Led **F6** (when decoder supports F6).

For more details see:

[Equivalent circuit diagram (MXTAP-Next18.pdf)]

Hint:

Testing F3 and F4 by SUSI Leds **Clk** and **Data** is a little bit irritating. To fix this, connect S**USI C** to **F3** and **SUSI D** to **F4** by two wires. This will give you feedback on Leds **F3** and **F4**.



*Connecting **SUSI C/D** to **F3** and **F4***

7 Testing a Decoder with Next18-S connector

This section shows how to test a decoder with Next18-S (no Next18) connector. See RCN-118 (http://normen.railcommunity.de/RCN-118.pdf) for details. A ESU LokSound micro V4.0 (with all CVs set to default ???) is used as example.

7.1 Connections

1. **SCHIENE TRACK** Programming Track Output of Programmer or Central Station
2. Plug decoder under test in **NEXT18**.

7.2 Jumpers

1. **OC/LL** to **LL**
2. **MX618** to open
3. **SPEAKER** to **Int**
4. **MX630** to open
5. **MX68x** to open
6. **MOTOR** to **Int**

7.3 Testing

Start Programming Software (JMRI for Example).

Press Button on MXTAP until Leds **L** and **R** lights up.

First try to identify decoder or read some CVs.

Open Throttle.

1. Changing speed and direction on throttle should be reflected by the **MOTOR** and Leds **FWD** and **RWD**.
2. Led **+V** should be illuminated.
3. Pressing button F0 on throttle should control one of Leds **LV** or **LR**. Changing the direction should toggle between **LV** (forward direction) and **LR** (backward direction).
4. Button F8 (???) on throttle should control Led **F1**.
5. Button F22 (???) on throttle should control Led **F2**.
6. Button F23 (???) on throttle should control Led **Clk**.
7. Button F24 (???) on throttle should control Led **Data**.

For more details see:

Equivalent circuit diagram (MXTAP-Next18.pdf)

See hint about F3 and F4 shown on SUSI LEDs in section about Next18.

8 Testing a Decoder with Plux22 connector

This section shows how to test a decoder with PluX22, PluX16 or PluX12 connector. See RCN-122 (http://normen.railcommunity.de/RCN-122.pdf) for details. A ESU LokPilot V4.0 DCC (order number 54617) with all CVs set to default is used as example.

8.1 Connections

1. **SCHIENE TRACK** Programming Track Output of Programmer or Central Station
2. Plug decoder under test in **PLUX22** (or **PLUX16** or **PLUX12**).

8.2 Jumper

1. **OC/LL** to **OC**
2. **MX618** to open
3. **SPEAKER** to **Int**
4. **MX630** to open
5. **MX68x** to open
6. **MOTOR** to **Int**

8.3 Testing

Start Programming Software (JMRI for Example).

Press Button on MXTAP until Leds **L** and **R** lights up.

First try to identify decoder or read some CVs.

Open Throttle.

1. Changing speed and direction on throttle should be reflected by the **MOTOR** and Leds **FWD** and **RWD**.
2. Led **+V** should be illuminated.
3. Led **CAP+** should be illuminated.
4. Pressing button F0 on throttle should control one of Leds **LV** or **LR**. Changing the direction should toggle between **LV** (forward direction) and **LR** (backward direction).
5. Button F1 on throttle should control Led **F1**.
6. Button F2 on throttle should control Led **F2**.
7. Button F5 on throttle should control Led **F3**.
8. Button F6 on throttle should control Led **F4**.
9. Button F7 on throttle should control Led **F5**.

10. Button F8 on throttle should control Led **F6**.
11. Button F9 on throttle should control Led **F7**.

For more details see:

Equivalent circuit diagram (MXTAP-PluX22.pdf)