

Gantry Crane 1:87

Description

This gantry crane was built in large numbers and can still be found at many load tracks today.

This finished model is constructed very finely in detailed plastic. Quiet miniature motors with metal transmissions lift and lower the crane hook and move the trolley. The crane has two adjustable outputs e.g. for lighting, lifting magnet or grip arm.

The model is equipped with a digital decoder, so that all functions can be controlled with either a DCC or Märklin Motorola Digital Center. Using the key connections, analog operation is also possible.

Packing contents

- Gantry crane fully assembled
- Roof with two bearers for optional mounting
- Instructions
- Adhesive label

Unpacking

Remove the upper foam material and then the lower foam material block from the packing. Hold the gantry crane by the base plate and carefully remove the middle foam block from the packing. The middle foam block consists of two sections between which the crane hook is located.

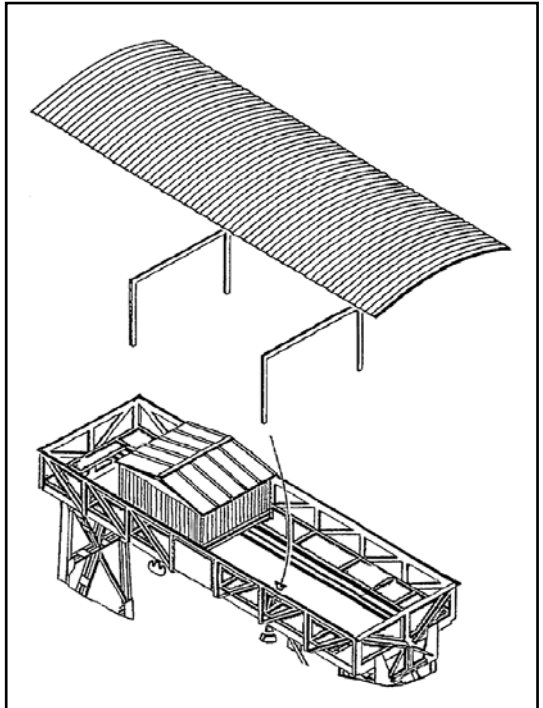
Tip: In order to avoid damage we recommend that you only transport the gantry crane in this packing.

Roof assembly

If desired glue the enclosed bearers to the intended location under the roof.

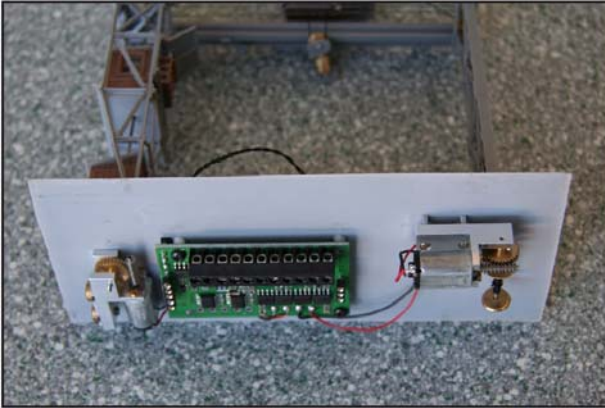
The roof should either be placed or only loosely fixed so that the trolley remains accessible in the case of service.

Note: During installation or in the case of transport the crane hook must be raised completely so that the rope cannot jump off the pulleys.

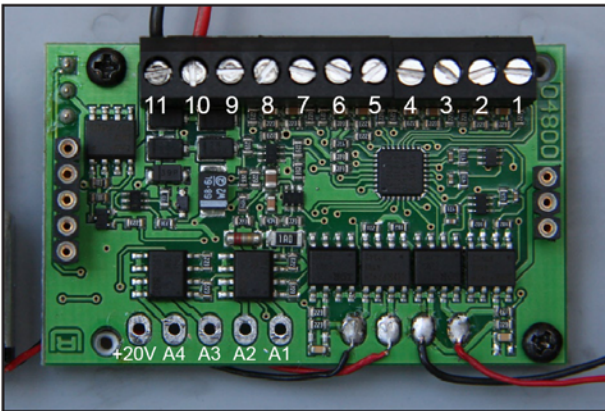


Connections

Put the gantry crane on your work area so that the terminals of the decoder point upwards. Make sure that the motors and transmission are free.



In the decoder which is centrally installed under the base plate you will find a 11-way terminal block as



well as 5 free soldering connections.

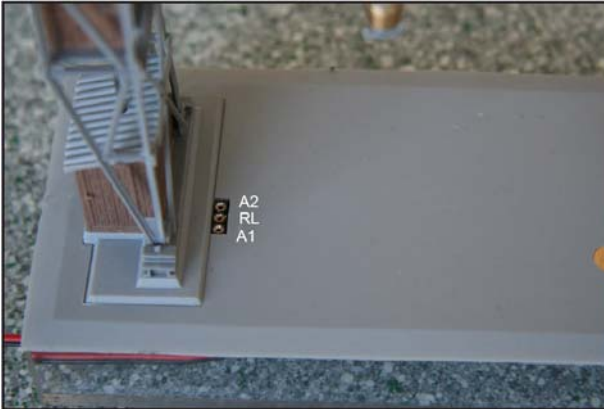
Allocation of terminals

- 1: Key 1 Crane Hook
- 2: Key 2 Crane Hook
- 3: Key 3 Crane trolley
- 4: Key 4 Crane trolley
- 5: Key 5 Output A1 on/off
- 6: Key 6 Output A2 on/off
- 7: Key 7 Output A3 on/off
- 8: Key 8 Output A4 on/off
- 9: Common return for the Keys
- 10 + 11 : Transformer (Analog operation) or Digital power (Digital operation)

Allocation of Solder connections

The solder pads connect to outputs A1 to A4, as well as +20V common return. Loads such as lighting, lifting magnet etc. can be connected here. These can then be switched by keys 5 to 8 in analog operations and special function keys f1 to f4 in digital operations.

3 pole socket in the Base plate



The 3 pole socket provides outputs A1 and a2 as well as the common return RL. Loads such as lighting, lifting magnet etc. can be connected here. The outputs can then be switched by keys 5 and 6 in analog operations and special function keys f1 and f2 in digital operations

Installation

Firstly saw a cutout of 124 x 53 mm in the layout's base board under the shipping track. There is a suitable template at the end of this description.

Attach sufficiently long cables to the appropriate connecting terminals.

Insert the gantry crane into the cutout by firstly passing the cables through it. You can use a commercial adhesive to attach the base plate of the gantry crane on the layout board.

Operating

Analog Operation

After the crane is installed the keys and transformer are connected. Use a 16V~ model railway transformer. Should you wish to operate loads on the A1 to A4 outputs connect them at this stage in accordance with above connection allocation. The gantry crane is now operational.

The crane hook can be operated by keys 1 and 2 and the trolley by keys 3 and 4. Should the end positions be reached without the respective motor being stopped the engine output is automatically switched off (overload protection).

Note: *The overload protection automatically switches the motor output off whenever the end positions are reached, if the motor is not stopped.*

Using Keys 5 to 8 outputs A1 to A4 can now also be controlled as described above.

For finer settings in the analog operations the crane decoder can be programmed with a digital center. The rotating speeds for the 4 motor movements, the starting inertia with analog key press, as well as the brake inertia when the key is released, can be adjusted.

Digital Operation

After the crane is installed connect the digital power (track power). Should you wish to operate loads on the A1 to A4 outputs connect them at this stage in accordance with above connection allocation. The gantry crane is now operational.

To operate the crane, call up locomotive address 3 on your digital center. Set locomotive address 3 to DCC data format with 14 speed steps on the center (if possible) or operate address 3 in Motorola format.

Attention: *The crane decoder works only in 14 speed step mode!*

If light function (f0) is switched off the crane hook can be controlled with the speed control. When light function (f0) is switched on you can control the trolley with the speed control. The adjusted speed step remains after switching the light function. If the end positions should be reached without having stopped the relevant motor the motor output is automatically switched off (overload protection).

Note: The overload protection automatically switches the motor output off whenever the end positions are reached, if the motor is not stopped.

By reversing the travel direction the speed is set to 0 and the motor output is reactivated (emergency stop without starting/brake inertia).

If outputs A1 to A4 have loads attached they can be switched by special function keys f1 to f4. The loads on A1 to A4 must operate on approximately +20V. The key terminals are not functional in the digital operations.

Programming

In factory default state all decoder options are changed using configuration variables (CVs) according to the DCC standard. The decoders can be programmed by an Intellibox, DCC Centre and Motorola Centre.

Programming with the Intellibox

Irrespective of the format to be driven later we recommend that the decoder be programmed via the programming menu for DCC decoders.

The Intellibox supports DCC programming with a simple input menu. Long addresses do not have to be laboriously calculated, they can be entered directly. The Intellibox automatically calculates the values for CV17 and CV18.

For the exact process please read the appropriate chapter in the Intellibox manual.

Special case Motorola Locomotive addresses 80 to 255

In Motorola format the Intellibox supports an address range 255. Addresses 1 to 80 can also be programmed easily using DCC programming mode. If an address above 80 is to be programmed, it must, however, be done as described in the chapter "Programming with a Märklin Centre".

After this programming technique CV 1 will be set to 0 and the decoder will use the Motorola address higher than 80.

Programming of long Addresses without Programming Menu

For programming with a centre which does not support programming with an input menu, the value for CV17 and CV18 must be calculated. Here is an example for programming the address 2000.

- Divide the addresses by 256 (2000:256 = 7 remainder 208).
- Take the result (7) and add it to 192.
- Program this value (199) into CV17.
- Program the remainder (208) into CV18.
- **Important:** Set Bit 5 of CV 29 to 1, so the decoder uses the long address.

Calculating the CV value

With CV29 and CV49 various characteristics of the decoder may be established.

The required values are easily calculated using the CV table and simple addition.

Example CV 49

Motorola off Value = 1
DCC on Value = 0
f1 toggle A1/A2 Value = 64
+20V on RL Value = 0

The Sum of all values is 65.

This value is programmed into CV 49.

Bit	Function CV 49	Value
0	Motorola on	0
	Motorola off	1
1	DCC on	0
	DCC off	2
6	f1 switch A1 and f2 switch A2	0
	f1 toggle A1/A2	64
7	+20V for Function outputs on RL (Base plate)	0
	Expansion module supplies RL (Base plate)	128

Programming with a Märklin Center

With a Märklin center all CVs can be programmed, but not read.

Note: *Before programming, the crane trolley must be driven into the center of the gantry.*

1. Switch Center off and on.
2. Select the address of the decoder and switch the light on.
3. Change the direction of travel 5 times in quick succession, until the motor jerks briefly.
4. Set the speed controller to "zero".
5. Enter the number of the CV that is to be programmed.
6. Briefly operate the reversing switch. The motor jerks briefly.
7. Enter the desired value for CV e.g. a locomotive address.
8. Briefly operate reversing switch. The motor jerks briefly.

If further CVs are to be programmed repeat points 5-8.

If programming is to be terminated switch the center to "STOP" or set the address to "80" and briefly operate the reversing switch.

Note: *Since a Motorola digital center from Märklin only accepts inputs of 01 to 80, the value "0" must be entered by entering the address as "80".*

Page-Register for inputting CV-Numbers greater than 79

CV addresses larger than 79 can only be programmed with the help of the page register, CV66. If CV66 has a value higher than 0, then the contents of CV66 times 64 will be added to every address entered. The entered value must lie in the range 1 to 64.

When leaving the Motorola programming mode, the page register (CV66) is automatically reset to zero.

Offset-Register for entering CV values greater than 79

CV values larger than 79 can only be programmed with the help of the offset register. The offset register is CV65. If CV65 contains a value > 0 , then all the following programmed values are calculated by multiplying the contents of CV65 by 4 and adding the result to the entered value.

When leaving the Motorola programming mode the offset register (CV65) is automatically reset to zero.

Example

CV49 is to be programmed with a value of 131, then CV65 must first be programmed with the value of 25. Subsequently, CV49 can be programmed with a value of 31. The decoder places the value $4 * 25 + 31$ into CV49.

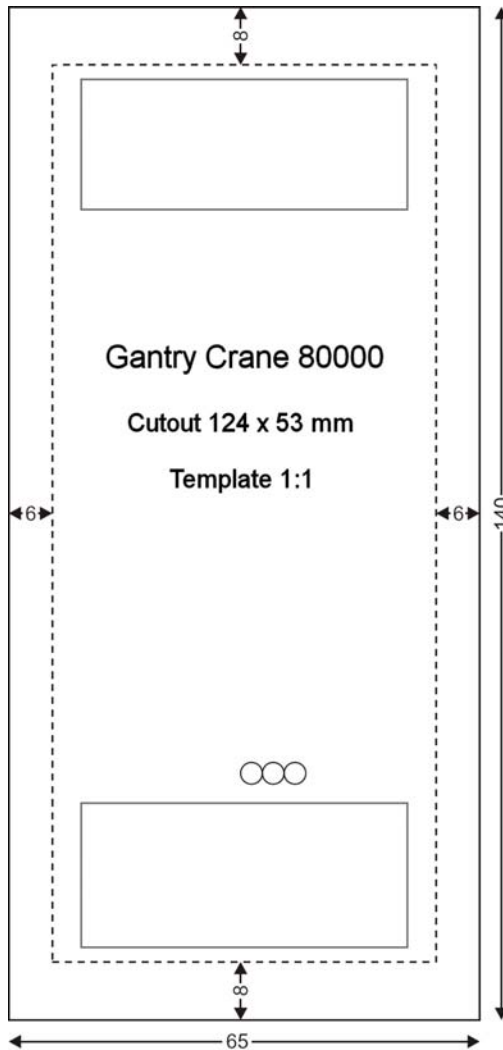
Note: *When programming CV65 and CV66 the contents of the offset and page registers have no effect.*

Table of individual CVs (Configuration Variables)

CV	Description	Value Range	Factory Default
1	Short Locomotive Address	1-127	3
2	Minimum Speed	1-63	5
3	Start Inertia	1-63	2
4	Brake Inertia	1-63	2
5	Maximum Speed <i>Must be greater than CV2</i>	1-63	20
6	Maximum Motor Voltage <i>Must not be changed</i>	1-255	64
7	Software Version <i>The processor used can be updated</i>	-	Varies
8	Manufacturer	-	85
17	Long Locomotive Address 17 = High Byte	1-9999	2000
18	18 = Low Byte	192-231	199
29	Configuration of both motors in DCC standard Bit 0=0 Driving direction not swapped Bit 0=1 Driving direction swapped Bit 1=0 14 Speed steps Bit 5=0 Short Address (CV 1) Bit 5=1 Long Address (CV 17/18)	Value 0 * 1 0 * 0 * 32	0-33 0
49	Decoder Configuration Bit 0=0 Motorola on Bit 0=1 Motorola off Bit 1=0 DCC on Bit 1=1 DCC off Bit 6=0 f1 switches A1 and f2 switches A2 Bit 6=1 f1 toggles A1/A2 (switches between A1 and A2) f1 off: A1 off und A2 on f1 on: A1 on und A2 off Bit 7=0 +20V for Function output RL on the base plate socket Bit 7=1 Extension module provides RL for the base plate socket <i>Note: If the Motorola data format is switched off in bit 3 and the DCC data format is switched off in bit 4, the decoder will not receive any more driving instructions and can only be programmed.</i>	Value 0 * 1 0 * 2 0 * 64 0 * 128	1-195 0
65	Motorola Programming Offset	0-255	0
67	Maximum Speed for Key 1 (Analog Operation)	0-255	40
68	Maximum Speed for Key 2 (Analog Operation)	0-255	40
69	Maximum Speed for Key 3 (Analog Operation)	0-255	50
70	Maximum Speed for Key 4 (Analog Operation)	0-255	50
71	Starting Inertia for Key 1 (Analog Operation)	0-255	5
72	Starting Inertia for Key 2 (Analog Operation)	0-255	5
73	Starting Inertia for Key 3 (Analog Operation)	0-255	5
74	Starting Inertia for Key 4 (Analog Operation)	0-255	5
75	Braking Inertia for Key 1 (Analog Operation)	0-255	1
76	Braking Inertia for Key 2 (Analog Operation)	0-255	1
77	Braking Inertia for Key 3 (Analog Operation)	0-255	1
78	Braking Inertia for Key 4 (Analog Operation)	0-255	1
79	Maximum Motor Voltage in Analog operation	0-255	180
98	Timed switching of Outputs A1 + A2 0 = both Outputs not timed 1 = only A1 timed switching 2 = only A2 timed switching 3 = A1 and A2 timed switching	0-3	3
99	Maximum 'On' time in Seconds for timed outputs as in CV 98	0-255	45

The factory default values are marked with an *.

Gantry Crane Template



Guarantee declaration

Each component is tested for its complete functionality before distribution. If a fault should arise within the guarantee period of 2 years, we will repair the component free of charge upon production of proof of purchase. The warranty claim is void if the damage was caused by inappropriate treatment.

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8583-27 Mon - Tue - Thu - Fri, 14:00-16:00 and Wednesdays 16:00-18:00

Our products are covered by a two year warrantee. If it is defective send decoder
along with the receipt of purchase to the following address:

Uhlenbrock Elektronik GmbH * Mercatorstr. 6 * 46244 Bottrop
Tel: 02045-8583-0 * Fax: 02045-8684-0 * www.uhlenbrock.de