Uhlenbrock digital

IntelliDrive Deluxe 77 500

Multiprotocol decoder Load Regulation

77 500 Features

- Regulated multi-protocol decoder for DCC (NMRA compliant) and Motorola
- Suitable for DC and bell armature motors
- Up to 3A continuous, peak 5A
- Quiet motor running by using 18.75 kHz control frequency
- 14, 27, 28, 128 speed steps, depending on data format
- Short addresses (1-127) and long addresses (for 128-9999)
- Minimum, maximum and middle speed configurable
- Adjustable minimum, maximum and medium speeds
- Speed step tables for 14 and 28 speed step mode
- Main line programming (DCC)
- Shunting mode (half speed) toggled using F3
- Starting/brake inertia switched using F4
- Headlights switched using F0, dimmable
- 8 special function outputs switched, dimmable or timed using F1 to F8
- With SUSI sound interface (4 pole mini socket) for the connection of sound modules or other modules controllable using auxiliary functions (f1 to f12)
- Reacts to DCC conforming brake signal (e.g. Power 3) or brake sections with DC voltage
- Overheating protection
- All output are short circuit protected
- Conventional DC or AC operation with automatic change-over on the respective operating mode
- All CV's are programmable with digital devices using DCC and/or Motorola formats
- In DCC layouts programmable using register, CV direct or page programming
- All special functions also switchable with LGB controllers
- Connection of older LGB sound modules is possible by outputting of LGB pulse trains (via output A1)
- Shuttle train service and intermediate stop or INDUSI using a locomotive reed contact and track magnets
- Optional: direction dependent or time-limited switching of the special functions f1 to f8.
- Updatable by Flash memory

Description

The 77 500 locomotive decoder is an efficient multi-protocol decoder for large scale trains. It can be used in DCC- and Motorola Digital systems and also works analog mode with DC or AC and direction of travel change-over using high voltage pulse (Märklin system).

The decoder works with a frequency of 18.75 kHz and is not only suitable for DC motors, but also for bell armature motors (e.g. Faulhaber, Maxon, Escap) up to a continuous power of 3A. Short term current of up to 5A are tolerated well.

The motor characteristics are setup either by means of the minimum, middle and maximum speeds or by different CV's for the individual speeds. The load control can be individually adapted to different locomotive motors by setting these control parameters.

The decoder has two travel direction of dependent lighting outputs, as well as eight additional special function outputs. Function keys f3 and f4 can be used to switch a shunting mode with extended low-speed operating range and the starting/brake inertia. The allocation of the switching tasks such as lighting, special function outputs, shunting mode and adjustable starting/brake inertia can be freely assigned to the function keys of the digital center (Function Mapping).

All CV's can be programmed with an Intellibox, DCC- or Märklin controller all devices.

In the factory condition the decoder automatically recognizes the DCC and Motorola data formats, as well as analog DC or AC power. The desired mode of operation can also be specified manually.

Installation of the locomotive decoder 77 500
Connection of the decoder

Connect terminal 1 to the right wheel power collector and terminal 2 to the left wheel power collector. The motor is connected to terminal 8 and terminal 9 of the decoder. Test whether the driving direction is correct. If not, the connections to the motor must be exchanged.

<u>Important</u>: The EMI suppression components remain on the motor.

Connection of 77 500
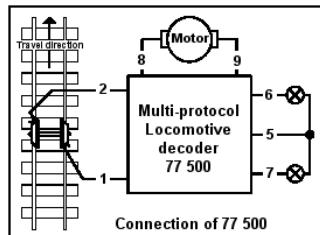
Connection of special functions

Connect the front light to terminal 6 and the rear light to terminal 7. The second pole of the lamps is connected to terminal 5 of the decoder or to the locomotive chassis. If the lamps do not light to match the driving direction, then the travel direction of the motor must be changed, by swapping the wires to the motor.

For travel direction independent switching the outputs can be connected in parallel.

9 - Motor 1
8 - Motor 2
7 - Light rear
6 - Light front
5 - +20V
4 - Reedkontakt
3 - Decodermasse
2 - Radsatz -
1 - Radsatz +

10 - + 20 V
11 - A 1
12 - A 2
13 - A 3
14 - A 4
15 - A 5
16 - A 6
17 - A 7
18 - A 8
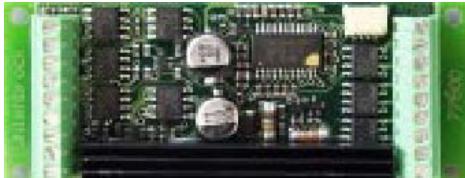
Note: If the driving direction of the locomotive does not agree with the indicator of your digital controller, you can reverse it by changing bits 0 of CV 29.

Additional special functions such as smoke generator, telex coupling or driver compartment lighting can be connected to the special function outputs A1 to A8. The return lines are connected either with terminal 10 of the decoder or the locomotive chassis.

Mounting the decoder in the locomotive

Use the mounting straps at the sides, to fasten the decoder in the vehicle with screws. If the mounting straps are not needed, then they can be carefully broken off at the break section with the help of flat-nose pliers.

Start-up

Examine the correct installation with a continuity tester or an ohm meter. Make sure that the unit is placed in the vehicle where a conducting connection could not develop! Ensure that even after re-assembly of the locomotive no short-circuits occur from jammed wires.

> **A short-circuit in the area of the motor, lighting, pick-up and wheel contacts possibly destroys the component and electronics of the locomotive!**

Digital and analog Operation

On digital layouts the decoder can be controlled in the Motorola or DCC data format. For the DCC operation 28 speed steps are preset.

If the decoder is used on conventional layouts it can be controlled either with a DC or an AC controller (system Märklin). All operating modes are automatically recognized by the decoder.

Function Mapping

Outputs A1 – A4 are assigned using CV's 33-38. Each bit in the CV 33-38 assigns a switching task to the appropriate special function key f0 to f4. If several bits are set, then the special function also controls several outputs. If the special key f4, which switches starting/brake inertia and output A4, is to switch shunting mode, then CV38 must contain the value of 224, and/or the bits 5, 6 and 7 must be set to 1.

Outputs A5 - A8 are assigned to special functions f0-f28 with CV's 108-111. The function numbers which are to switch these outputs can be programmed directly into CV's 108-111. Additionally it is possible to switch the function output on only when the locomotive is running, independent of all function keys. For this functionality the CV which is assigned to the output must be programmed with a value of 30. If for example output A6 is to be switched on every time the locomotive is running and off when the locomotive is stopped CV 109 = 30 must be programmed.

Additionally the outputs can be made direction and time dependent.

Travel direction dependant special functions A1 – A8

If one or several of the outputs A1-A8 should be switched on only in one driving direction, then all outputs can be deactivated separately for the driving direction forward or backwards. Using the individual bits of CV96 all outputs can be individually switched off for the forward direction. Similarly outputs can be switched off in the backwards direction using CV97.

Switch on limiting for special functions A1 – A8

If one or several of the outputs A1-A8 are to be switched on only for a limited duration, then each output can have separately limited ON time using CV98. Each bit of the CV98 activates the timer for one of the special functions f1-f8. The max. ON time can be specified in CV99 for all special functions. The programmed value is the max. on time in seconds. If the switch-on limitation is activated, then the corresponding function output switches OFF after the time in CV99 expires, even if it is still switched on at the digital controller. This function can be used e.g. for electrical couplings.

Dimming of Special function output A1 – A8

Outputs A1 – A8 can be dimmed independently of the light outputs. The dimming can be configured in CV 113 (0=off, 63=100%).

CV 112 is used to configure which function output A1 – A8 is to be dimmed. The individual bits in CV 112 configure the corresponding function outputs. Bit 0=1, A1 dimmed, … Bit 7=1, A8 dimmed.

Outputs A1 - A8 in Analog operation

The state of outputs A1 - A8 in analog mode can be specified using CV13. Each bit of CV13 corresponds to the state of an output (1=ON or 0=OFF).

Motor load regulation

Motor load regulation to suit the locomotive is adjusted using CV's 53 to 58.

Proceeding:

1. Set CV53 to 255. Test drive the locomotive and reduce the value of CV53 until the locomotive runs smoothly. (Note: use only values larger 70)
2. If the locomotive runs jerkily at the lowest speed step, CV58 must be increased.
3. If the locomotive does not run at speed step 1, CV56 must be increased, until the locomotive runs very slowly.
4. If the transitions from speed stop to speed step is too abrupt at lower speeds, then CV57 must be increased to approx. 20.
5. If CV57 has a value greater than 1 and the locomotive takes too long to start, then CV55 must be increased, until the locomotive starts quickly enough and still smoothly.

All values must be determined experimentally by running tests and will possibly be different for each vehicle.

INDUSI

If CV62 is set to 1, the decoder will operate in INDUSI mode. In order to be able to use this function, a reed switch must be connected between terminal 3 and 4. The reed switch is attached under the locomotive, over track center, and is not to be covered by other metallic parts. Centrally in the track an electromagnets are mounted in such a way that they can close this reed switch.

An electrical track magnet is attached after a stop signal. When the signal shows STOP, the electromagnet must be energized. If the locomotive overshoots now the stop signal and the to active electromagnets, the locomotive implements emergency braking. Electromagnets such as those from the Faller Car system be can used.

Braking Section

The braking section function is active when CV 62 has a value of 2. In this case the decoder brakes using the configured braking delay and stops as soon as a track magnet is passed. If the brake has been activated once and the vehicle passes over a second track magnet the vehicle is stopped by emergency brake (INDUSI). If the vehicle is stopped it can be started in two ways: 1. The speed step on the digital center is set to Zero and subsequently to a new speed step. 2. While stationary the reed switch is closed once more and opened again. For this it must be connected to terminal 4 of the connector and switched with a function output A1 - A8. The vehicle drives off again when this special function is turned off and on once.

Shuttle train-/Stopping operation

If CV62 is set with a value greater then or equal to 2, the decoder will operate in shuttle train e and/or 'stopping' mode. In order to be able to use this function, a reed switch must be connected between terminals 3 and 4. The reed switch is attached under the locomotive, over track center, and is not to be covered by other metallic parts. Centrally in the track, magnets are attached in such a way that they can activate the reed switch under at the locomotive.

If the locomotive with the reed contact passes over a track magnet, it locomotive automatically stops without any changes at the driving desk, and after a selectable time and drives off again. Starting and brake inertia of the locomotive can be adjusted with CV3 and 4. If the locomotive passes over two track magnets in short succession,

approx. 5 to 10 cm apart, the locomotive stops for a selectable time, without changes at the driving desk, and automatically drives off in the opposite direction. If during this automatic phase, (braking, stopping or driving off) the direction or the driving speed is changed by the controller, the automatic phase is terminated and the locomotive drives according to the operation set by the controller. The halt time is set by CV62. The programmed value corresponds to half the stopping time (e.g. CV62 = 30 corresponds to stopping time of 60 seconds).

Note: If the automatic function is to be adjustable, then connection of the reed switch must be connected between terminal 4 and the function output A1 to A8. The automatic function can be turned on and off by the assigned function key f1-f8.

Start/braking inertia

If the starting/brake inertia is switched off by a special function or if an emergency stop is issued by the controller or the INDUSI function is activated, the decoder uses CV103 and CV104 adjustable delay constants.

LISSY transmitter 68 400

If CV115 greater than 0 (1-4), a LISSY transmitter 68 400 can be attached to the SUSI interface of the decoder. The operation of a sound module is then not possible. The registered value (1-4) is then used by LISSY as the train category. The operation of a Sound module is then no longer possible.

Operating the decoder with an LGB digital controller

So that the decoder can work correctly with an LGB digital center can following CV's must be changed:

CV 29 = 4 (14 speed steps, automatic change-over on analog layouts)

CV 49 = 2 (special function control f1-f8 with an LGB controller)

Connection of an LGB auxiliary sound circuit for special function control

If an original LGB auxiliary circuit is to be attached to the decoder, then the control input of the auxiliary circuit must be connected with the terminal 11 (output A1). So that the decoder outputs the necessary control signals at output A1, bit 2 of spends CV 49 must be set to 1. The special function output A1 can no longer be used for other tasks.

Programming

The Configuration variables (CV's) form the basis of all possible operations of the decoder in accordance with the DCC standard. The decoder can be programmed with the Intellibox, DCC controllers and Motorola controllers.

Programming with the Intellibox

We recommend, that irrespective of the data format that will eventually be used, that the decoder be programmed using the menu for DCC decoders.

The Intellibox supports DCC programming with a user friendly input menu. Long addresses do not have to be calculated laboriously, as they can be entered directly. The Intellibox calculates the values for CV 17 and CV 18 automatically.

For precise instructions please read the appropriate chapter in the Intellibox manual.

Programming with DCC devices

Use the programming menu of its DCC controller, to select and program the decoders CV's by register, CV directly or page mode programming. With a DCC controller it is also possible to be program the decoder using main line programming. For the exact procedure refer to the manual of controller the use.

Programming of long addresses without programming menu

If programming is to be done with controllers that do not support programming with an input menu, the values for CV 17 and CV 18 must be calculated. Here is a guide for programming of address 2000.

- Divide the address by 256 (2000/256 = 7 remainder of 208).
- Take the integer result (7) and add 192
- Program the result (199) into CV 17
- Program the remainder (208) into CV 18
- *Important*: Set bit 5 of CV 29 to 1, so that the decoder uses the long address.

Values for calculating the CV value

CV's 29 and 49 can be used to set the decoder into different modes.

The value to programmed is calculated by using the CV and summing the values of the desired functions.

Example

Normal driving direction	value = 0
28 speed steps	value = 2
Auto Analog/digital change over	value = 4
Speed steps using CV 2, 5, 6	value = 0
Short address	value = 0

The sum of all values is 6. CV 29 preset to this value ex factory.

Bit	CV 29 function	Value
0	Normal driving direction	0
	Reverse driving direction	1
1	14/27 speed steps	0
	28/128 speed steps	2
2	Only digital operation	0
	Automatic analog/digital change over	4
4	Speed steps using CV2, CV5 and CV6	0
	Characteristics using CV67-CV94	16
5	Short address (CV1, register 1)	0
	Long address (CV17 and CV18)	32

Programming with a Märklin Center

With a Märklin center all CV's can be programmed, but not read.

1. Switch Center off and on.
2. Select the address of the decoder and switch the light on.
3. Operate the direction change-over 5 times in quick succession with the stationary locomotive (speed step 0), until the light turns off.
4. Set the speed controller to "zero". The rear light now flashes slowly 4 times.
5. Enter the number of the CV that is to be programmed.
6. Briefly operate the direction change-over. The rear light flashes fast 4 times.
7. Enter the desired value for CV e.g. a locomotive address.
8. Briefly operate the direction change-over. The rear light flashes slowly 4 times.

If further CV's 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 direction change-over.

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 Motorola programming mode the page register (CV66) is set automatically reset to zero.

Example

If CV82 is to be programmed with a value of15, then CV66 must first be programmed with a value of 1. Subsequently, CV18can be programmed with a value of 15. The decoder places the value 15 into CV82, which id derived from the multiplying the contents of the CV66 (in the example 1) by 64 (thus 64) and then adding the entered CV address (18).

Offset-Register for entering CV values greater than 79

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

Example

CV49 is to be programmed with a value of 157, then CV65 must first be programmed with the value of 25. Subsequently, CV49 can be programmed with a value of 57. The decoder places the value 4 * 25 + 57 into CV49. Subsequently, CV65 should be reset to zero, so that following values smaller than 79 are not inadvertently erroneous

Note: When programming CV65 and CV66 the contents of offset and page registers are ignored.
Note: If the Motorola Programming mode is left, then page and offset register (CV65, CV 66) are automatically reset to zero.

Märklin braking section

The decoder reacts to a Märklin brake section (brakes with analog power on the track), if CV29 bit 2 and CV49 bit 7 are set to 1 (factory setting 1 and 0).

Technical Data

Addresses:	1-9999 (long DCC address)
Max. current consumption:	1 A
Function outputs:	1 A each
Size:	22 x 12.5 x 5.5 mm

Factory defaults

The factory setting places the decoder in DCC/Motorola operating mode. It automatically switches between both formats. Additionally the decoder can operate on conventional analog layouts with a DC or AC controller (Märklin system). Function key f3 switches shunting mode and Function key f4 switches Start-/braking inertia. All other Function key switch their corresponding output.

Table of CVs (Configuration Variables)

CV	Description		Value range	Default
1	**Locomotive address**		DCC 1-127,Mot 1-80	3
2	**Minimum Speed**		1-63	1
3	**Acceleration** 1 means that every 5 ms the actual speed is increased by 1 If the internal maximum speed is set to 200 (CV5=50 or CV94 = 200), then acceleration time from 0 to Fmax is 1sec.		1-63	2
4	**Braking inertia** (time factor CV3)		1-63	2
5	**Maximum speed** (must be greater than CV2)		1-63	48
6	**Middle speed** (must be greater than CV2 and less than CV5)		1-63	24
7	**Software version** (The processor can be updated)		-	varies
13	**Sonderfunktionen im Analogbetrieb** Bit 0 = Zustand für f1 bis Bit 7 = Zustand für f8		0-255	0
8	**Manufacturer ID**		-	85
17 18	**Long locomotive address** 17 = high byte / 18 = low byte		1-9999 199-231/0-255	2000 199/208
19	**Consist address** (double traction) 0 = Consist address inactive When bit 7=1 the driving direction is reversed The desired speed CADR + 128 = reverse direction		1-127	0
29	**Configuration for DCC** Bit 0=0 Normal direction Bit 0=1 reversed travel Bit 1=0 14 speed steps Bit 1=1 28 speed steps Bit 2=0 Only digital operation Bit 2=1 automatic analog/digital switching Bit 3 Not used Bit 4=0 Speed steps using CV 2, CV 5, and CV 6 Bit 4=1 Characteristics using CV 67 to CV 94 Bit 5=0 Short address (CV 1) Bit 5=1 Long address (CV 17/18) Bit 6/7 Not used	Value 0 * 1 0 2 * 0 4 * - 0 * 16 0 * 32	0-255	6
33	**Allocation of the function outputs, which are to be activated with function keys like light and special functions** Bit 0 Lichtausgang vorn Bit 1 Lichtausgang hinten Bit 2 Sonderfunktionsausgang A1 Bit 3 Sonderfunktionsausgang A2 Bit 4 Sonderfunktionsausgang A3 Bit 5 Sonderfunktionsausgang A4 Bit 6 Rangiergang Bit 7 Anfahr-/Bremsverzögerung	1 * 2 4 8 16 32 64 128	0-255	1
34	Zuordnung der Funktionsausgänge, die mit der Lichtfunktion (function) bei Rückwährtsfahrt aktiviert werden. Belegung der einzelnen Bits s. CV 33		0-255	2
35	Zuordnung der Funktionsausgänge, die mit der Sonderfunktionstaste f1 aktiviert werden. Belegung der einzelnen Bits siehe CV 33		0-255	4
36	Zuordnung der Funktionsausgänge, die mit der Sonderfunktionstaste f2 aktiviert werden. Belegung der einzelnen Bits siehe CV 33		0-255	8
37	Zuordnung der Funktionsausgänge, die mit der Sonderfunktionstaste f3 aktiviert werden. Belegung der einzelnen Bits siehe CV 33		0-255	64
38	Zuordnung der Funktionsausgänge, die mit der Sonderfunktionstaste f4 aktiviert werden. Belegung der einzelnen Bits siehe CV 33		0-255	128

Ex-factory values are marked with *.

CV	Description	Value range	Default
49	**Locomotive decoder configuration** Value	0-255	32
	Bit 0=0 Motor load regulation On 0 *		
	Bit 0=1 Motor load regulation Off 1		
	Bit 1=0 Change of f1-f8 NMRA-DCC / Motorola 0 *		
	Bit 1=1 Functions f1-f8 using LGB Center 2		
	Bit 2=0 A1 output with mapping via CV 33-38 0 *		
	Bit 2=1 A1 output LGB pulse train for old LGB module 4		
	Bit 3=0 Brake speed step 0 in a brake section 0 *		
	Bit 3=1 Brake speed step in CV52 8		
	Bit 4=0 Data format DCC and Motorola 0 *		
	Bit 4=1 Data format only DCC 16		
	Bit 5=0 Data format DCC and Motorola 0 *		
	Bit 5=1 Data format only Motorola 32		
	Bit 6=0 Light outputs not swapped 0 *		
	Bit 6=1 Light outputs swapped 64		
	Bit 7=0 Brake only with brake signal 0 *		
	Bit 7=1 Brake with analog potential 128		
	Attention: When the Motorola data format is selected by Bit 3 and the DCC data format by Bit 4, the decoder no longer receives speed commands and can only be programmed.		
50	**Dimming of Function outputs A1, A2 and Light outputs**	0-49	25
51	**Configuration of analog operation** 1 = only AC operation, 2 = only DC operation, 3 = automatic recognition	1-3	3
52	**Final speed in a braking section** Effective when CV49 Bit 2=1 and Bit 7=1	0-255	30
53	**Motor regulation repetition rate** (CV 49, Bit 0=1) Rate = **value** * 53us Note: If the locomotive does not run smoothly, then this parameter can be changed. Only values between 70 and 255 are meaningful	70-255	150
54	**Motor regulation parameter**: Increases Motor potential	0-255	2
55	**Motor starting potential**	0-255	0
56	**AD transducer correction**	0-255	1
57	**Speed step transition timing** bit 0-6 Bit 7=0 - locomotives runs with speed step 1 Bit 7=1 -at speed step 1 only the sound is activated (diesel locomotives)	0-255	2
58	**Time slot for AD transducer measurement**	0-255	20
59	**Reset to factory defaults** If this CV is set to 1, the decoder will be returned to factory setting.	0, 1	0
60	**Short circuit monitoring** 0 = inactive, 250 = active (do not change)	0, 255	63
61	**Shutdown temperature in °C (90°C)** 0 = Temperature monitoring Off	0-255	37
62	**Shuttle train und braking or INDUSI** 0 = inactive, 1 = INDUSI 2-127 = half stopping time in Second (10 = 20 stop for seconds)	0-127	0
63	**Offset-Register** for CV programming. with a Motorola center	0-255	0
64	**Page Register** for CV programming. with a Motorola center	0-255	0
67	Speed setting for step 1	0-255	5
68	Speed setting for step 2	0-255	7
69	Speed setting for step 3	0-255	10
70	Speed setting for step 4	0-255	12
71	Speed setting for step 5	0-255	15
72	Speed setting for step 6	0-255	17
73	Speed setting for step 7	0-255	20
74	Speed setting for step 8	0-255	22
75	Speed setting for step 9	0-255	25
76	Speed setting for step 10	0-255	27
77	Speed setting for step 11	0-255	30
78	Speed setting for step 12	0-255	32
79	Speed setting for step 13	0-255	35
80	Speed setting for step 14	0-255	37
81	Speed setting for step 15	0-255	42
82	Speed setting for step 16	0-255	50
83	Speed setting for step 17	0-255	55
84	Speed setting for step 18	0-255	60
85	Speed setting for step 19	0-255	65
86	Speed setting for step 20	0-255	70
87	Speed setting for step 21	0-255	75
88	Speed setting for step 22	0-255	80
89	Speed setting for step 23	0-255	85
90	Speed setting for step 24	0-255	90
91	Speed setting for step 25	0-255	95
92	Speed setting for step 26	0-255	100
93	Speed setting for step 27	0-255	105
94	Speed setting for step 28	0-255	110

CV	Description	Value range	Default
96	Special functions A1-A8 switched off when traveling forwards Bit0 = A1 switched off to Bit7 = A8 switched off	0-255	0
97	Special function A1-A8 switching off when traveling backwards Bit0 = A1 switched off to Bit7 = A8 switched off	0-255	0
98	A1-A8 only switched on for only a time limited time	0-255	0
99	Special function cycle time in seconds, if CV98 is active	0-255	5
103	Start Inertia when the delay is activated by Special function key	0-63	1
104	Braking delay with INDUSI or Emergrncy Stop	0-63	1
108	Assignment of the Special function to switch Output A5 (30 = Driving bit)	0-28	5
109	Assignment of the Special function to switch Output A6 (30 = Driving bit)	0-28	6
110	Assignment of the Special function to switch Output A7 (30 = Driving bit)	0-28	7
111	Assignment of the Special function to switch Output A8 (30 = Driving bit)	0-28	8
112	Assignment of the Dimming to Outputs A1 – A8	0-255	0
113	Dimming of Outputs A1 – A8 (0=off, 63=100%)	0-63	32
115	LISSY 0 = SUSI-Buchse für Soundmodul 1-4 = SUSI-Buchse für LISSY Sendemodul 68 400. Der eingetragene Wert kennzeichnet gleichzeitig dieLISSY-Zugkategorie.	0-4	0

*Ex-factory values are marked with *.*

www.uhlenbrock.de

Our website for information on the Intellibox, pricelist or distributor list or various publications for download.

Guarantee declaration

Each component is tested for its complete functionality before distribution. If a fault should arise within the guarantee period area 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.

Please you note that, according to EMV law, the component may only be installed in vehicles, which carry the CE logo.

The trade names mentioned are registered trade marks of the respective companies.

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We are available if you have any questions!

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   Mon - Tue - Thu – Fri, 14:00~16:00

Service: In the event of a defect or failure send the unit together with the invoice and a short description of the fault back to us for repair and the decoder address.

4033405 775002

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belong in household rubbish

CE

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