Digitrax Notes

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Contents

Chapter 1

Loconet OpCodes

1.1 Introduction

OPC_BUSY

Operation: Indicates that the master is busy.

Group: 2-Byte Message

Direction: ↔ Command Station

Encoding:

1	0	0	0	0	0	0	1	0x81 <OpCode>
0	1	1	1	1	1	1	0	0x7E <CheckSum>

Description:

This message indicates that the master is busy. When sent to a command station it responds with an OPC_PEER_XFER message.

Response:

NONE

Notes:

OPC_GPOFF

Operation: Global power off request.

Group: 2-Byte Message

Direction: → Command Station

Encoding:

1	0	0	0	0	0	1	0	0x82	<OpCode>
0	1	1	1	1	1	0	1	0x7D	<CheckSum>

Description:

This command turns off the track power.

Response:

NONE

Notes:

OPC_GPON

Operation: Global power on request.

Group: 2-Byte Message

Direction: → Command Station

Encoding:

1	0	0	0	0	0	1	1	0x83	<OpCode>
0	1	1	1	1	1	0	0	0x7C	<CheckSum>

Description:

This command sends a global power on request.

Response:

The command station sends an OPC_RQ_SL_DATA message for slot 0x7F. It also sends a sequence of OPC_SW_REQ messages with the following values of SW1 and SW2:

SW1	SW2
0x78	0x27
0x79	0x27
0x7A	0x27
0x7B	0x27
0x78	ox07
0x79	0x07
0x7A	0x07
0x7B	0x07

Notes:

OPC_IDLE

Operation: Force idle state and broadcast emergency stop.

Group: 2-Byte Message

Direction: → Command Station

Encoding:

1	0	0	0	0	1	0	1	0x85	<OpCode>
0	1	1	1	1	0	1	0	0x7A	<CheckSum>

Description:

This command forces Loconet into the idle state and broadcasts an emergency stop.

Response:

None

Notes:

OPC_LOCO_ADR

Operation: Request a slot number for a locomotive.

Group: 4-Byte Message

Direction: → Command Station

Encoding:

1	0	1	1	1	1	1	1	0xBF	<OpCode>
0	h	h	h	h	h	h	h	<HADR>	High Address Bits (Address >> 7)
0	l	l	l	l	l	l	l	<LADR>	Low Address Bits (Address AND 0x7f)
0	c	c	c	c	c	c	c	<CHK>	<CheckSum>

Description:

This message requests the slot number for the selected locomotive address. If the locomotive is found in the slot table then the command station returns an OPC_SL_RD_DATA message with the slot information. If it is not found then the command station will put the locomotive into a free slot and then return an OPC_SL_RD_DATA message with the slot information. If there are no free slots then the command station returns an OPC_LONG_ACK error code.

Response:

OPC_SL_RD_DATA if success, otherwise OPC_LONG_ACK.

Notes:

The Loconet 1.1 specification specifies that <HADR> shall be the value 0x00.

OPC_SL_RD_DATA

Operation: Returns slot data.

Group: Variable-Byte Message

Direction: Command Station →

Encoding:

BYTE 0:

1	1	1	0	0	1	1	1	0xE7	<OpCode>
0	1	1	1	1	1	1	0	0x0E	Message Length (14 bytes including checksum)
0	n	n	n	n	n	n	n	<SLOT>	Slot number in the range 0x00 to 0x7F. Slot 0x00 is a special slot, and slots in the range 0x70 to 0x7F are reserved to Digitrax.
s7	s6	s5	s4	s3	s2	s1	s0	<STAT1>	Slot Status 1.

s7	s6	
0	0	Free, no consist linking.
0	1	Consist sub-member.
1	0	Consist top-member.
1	1	Consist Mid-Consist member.

Note: s7 is set to 0 in the message by the command station and so may not correctly reflect the actual setting in the slot table.

s5	s4	
0	0	Free slot, no valid data. Not refreshed.
0	1	Common. Locomotive address in this slot. Refreshed.
1	0	Idle. Locomotive address in this slot. Not refreshed.
1	1	In Use. Locomotive address in this slot. Refreshed.

s3	
0	No slot consist linked into this slot.
1	Slot consist linked into this slot.

s2	s1	s0	
0	0	0	28 step decoder. 3-byte packet regular mode
0	0	1	28 step decoder. Generate trinary packets for this mobile address
0	1	0	14 step decoder.
0	1	1	128 step decoder.
1	0	0	28 step decoder. Allow advanced consisting
1	0	1	reserved
1	1	0	reserved
1	1	1	128 step decoder. Allow advanced consisting

0	l	l	l	l	l	l	l

<LADR> Low Address Bits (Address AND 0x7f)

0	s	s	s	s	s	s	s

<SPD> Speed in the range 0x00 to 0x7F. 0x00 means inertial stop and 0x01 means emergency stop. Other values mean increasing speed.

0	d6	d5	d4	d3	d2	d1	d0

<DIRF> Locomotive direction and state of function keys F0 to F4.

d6 Reserved. Set to 0.
d5 Locomotive direction. 1 means forward, 0 means backwards.
d4 F0 state. 1 means on, and 0 means off.
d3 F4 state. 1 means on, and 0 means off.
d2 F3 state. 1 means on, and 0 means off.
d1 F2 state. 1 means on, and 0 means off.
d0 F1 state. 1 means on, and 0 means off.

0	t6	t5	t4	t3	t2	t1	t0

<TRK> Global system track status.

t6 Reserved. Set to 0.
t5 Reserved. Set to 0.
t4 Reserved. Set to 0.
t3 1 means the programming track is busy.
t2 1 means this master implements Loconet version 1.1 capability,
0 means the master is a DT200.
t1 0 means the track is paused, broadcast an emergency stop.
t0 1 means the DCC packets are on in the master, global power up.

0	i6	i5	i4	i3	i2	i1	i0

<SS2> Slot Status 2.

i6 Reserved. Set to 0.
i5 Reserved. Set to 0.
i4 Reserved. Set to 0.
i3 Reserved. Set to 0.
i3 1 means expansion in ID1/2, 0 means encoded alias.
i2 1 means expansion ID1/2 is not ID usage.
i1 Reserved. Set to 0.
i0 1 means this slot has supressed advanced consist.

0	h	h	h	h	h	h	h

<HADR> High Address Bits (Address >> 7)

0	c	c	c	c	c	c	c

<CHK> Checksum

Description:

This message is sent by the command station in response to a data request.

Response:

NONE

Notes: