OpenLCB Standard	
OpenLCB Unique Identifiers	
Mar 12, 2011	Preliminary

1 Introduction (Informative)

This specification describes the format and allocation of OpenLCB 48-bit unique identifiers. It is not specific to any wire protocol.

For more information on format and presentation, see:

- OpenLCB Common Information Technical Note

2 Intended Use (Informative)

Many OpenLCB protocols rely on each node having a node ID, and those node IDs being absolutely unique between nodes. OpenLCB defines 48-bit unique identifiers for this purpose. Unique identifiers are also used to ensure that Event Identifiers are uniquely specified, and for other purposes. This Standard is intended to ensure these unique IDs are available. It applies to all OpenLCB uses of 48-bit unique identifiers, including as node identifiers.

3 References and Context (Normative)

(Intentionally left blank)

4 Content and Format (Normative)

An OpenLCB unique identifier (unique ID) shall be six bytes of eight bits each.

The order of bytes in an OpenLCB unique ID shall be considered significant. The most-significant byte shall be transmitted first during communication operations. The most-significant byte shall be written first (left-most in Western format) in any human-readable representation.

An OpenLCB unique ID shall include one or more 1 bits.

Every OpenLCB node shall have a unique identifier to use as a node identifier (node ID).

5 Allocation (Normative)

Unique identifiers shall be allocated using one of the mechanisms in this section.

When additional allocation methods are defined, those the unique IDs defined by those additional methods shall only provide allocation ranges that do no overlap with existing allocation ranges.

Allocated ranges shall not be reused for other allocations.

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5.1 Unique identifiers assigned by manufacturers

Manufacturers who have been assigned a manufacturer ID number by the NMRA may, but are not required to, use their NMRA manufacturer ID number to self-assign unique identifiers within a range defined by:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0x02	0x01	Mfg ID byte	self-assigned		

Manufacturers shall ensure uniqueness for identifiers they assign.

5.2 Unique identifiers assigned by members of organized groups

An NMRA member may, but is not required to, use their NMRA membership number to self-assign unique identifiers within the range defined by:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0x03	0x00	NMRA Member Number			Self-assigned

A MERG member may, but is not required to, use their MERG membership number to self-assign unique identifiers within the range defined by:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0x03	0x04	MERG Member Number			Self-assigned

Individuals using these assignment patterns shall ensure uniqueness for identifiers they assign.

MERG CBUS has a defined method for specifying a unique 16-bit Node Number (NN) for CBUS use, along with an optional 16-bit Layout Number (LN). People may, but are not required to, use a unique CBUS node number to generate an OpenLCB unique identifier as follows:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0x03	0x08	LN High Byte	LN Low Byte	NN High Byte	NN Low Byte

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Future definition of ranges for additional groups will use unique values in Byte 2.

5.3 Unique identifiers assigned by software at run-time

A program running in a computer with a global IP address may, but is not required to, use that IP address to self-assign unique identifiers using the pattern:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0x04	IP address				self-assigned

IP addresses in the following ranges shall not be used for this method:

0.0.0.0 – 0.0.0.255

10.0.0.0 – 10.255.255.255

127.0.0.0 – 127.0.0.255

169.254.0.0 – 169.254.255.255

172.16.0.0 – 172.31.255.255

192.168.0.0 – 192.168.255.255

Programs using this assignment pattern shall ensure uniqueness for identifiers they assign.

5.4 Globally defined unique identifiers

OpenLCB defines specific well-known identification numbers and number ranges for specific uses. The details of these ranges are defined in other Standards and/or have been reserved for future use.

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Use
0x01	1	0x00	0x00	0x00	0x00	Well-known Event IDs
0x01	1	0x01	0x00			CBUS mapped Event IDs
0x01	99					XpressNet translation
0x01	129					LocoNet packet transport
0x01	238					DCC translation

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5.5 Unique identifiers assigned for use with locomotive control systems

OpenLCB defines specific well-known identification numbers and number ranges for interoperation with existing locomotive control systems. The details of these ranges are defined in other Standards and/or have been reserved for future use.

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Use
0x06	0x00					DC (block)
0x06	0x01					DCC
0x06	0x02					TMCC
0x06	0x03					Marklin/Motorola
0x06	0x04					MTH DCS

5.6 Unique identifier ranges assigned by request

Any individual or corporation shall be able to obtain permanent allocations of blocks of 2^8, 2^{16} and 2^{24} node identification numbers via the http://www.openlcb.org web site.

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0x05	0x01	Assigned by web site			Self-assigned

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0x05	0x02	Assigned by web site		Self-assigned	

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0x05	0x03	Assigned by web site	Self-assigned		

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5.7 Reserved unique identifiers

All other unique identifiers not specifically discussed in this Standard shall not be used until the Standard is revised to permit their use.

Unique identifiers in the following ranges shall not be used at any point:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
0x00	Any				
0xFF	Any				

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