NMT Protocol – Network Managment – CanOpen

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The NMT Protocol is used by the master node to start/stop and reset the slave nodes of the system. Depending on configuration settings (in the object dictionary) nodes may start up in run or pre-operational state. Any nodes in pre-operation state will require being set to run by the master

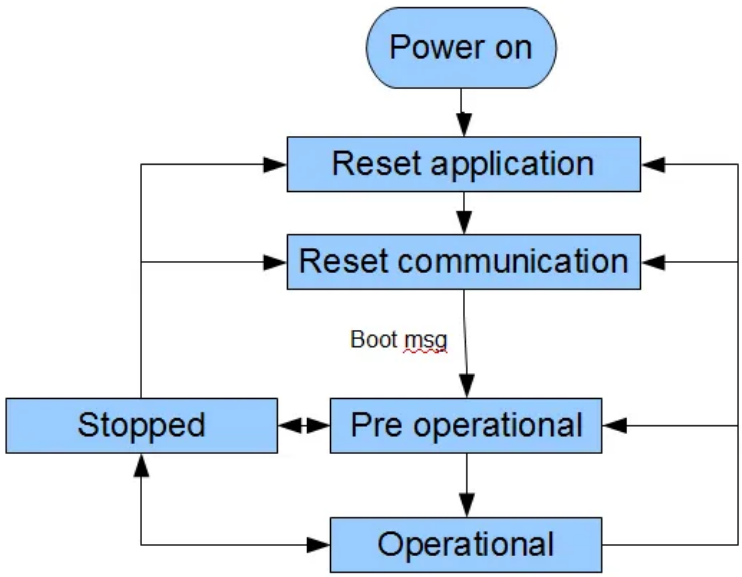
The NMT packet is aways sent with a COB-ID of 0x000 this is the highest priority message that can be sent and it has the following format.

COB-ID	rtr	len	NMT Function	Target Node
0x000	0	2	1 byte	1 byte

Target Node can be either the specific node to address 0x01-0x7F or 0x00 to address all nodes on the bus

NMT Function can be one of the following

Code	NMT Function
0x01	Enter Operational
0x02	Enter Stop
0x80	Enter Pre-operational
0x81	Reset node
0x82	Reset communication



(https://i0.wp.com/www.byteme.org.uk/wp-content/uploads/2015/11/canopennmtstate3.png)

After power on the node automatically enters initialization, it then moves to pre-operational and emits a Guard 0x700 Message of type bootup to signal to other nodes that it is present and awake. Depending on the nodes configuration it may then automatically enter Operation state. The Initalisation state is formed from two substates, reset application and reset communications. Reset application resets all the object dictionary entries from the standard profile and the manufacture specific sections. Reset communication resets the object dictionary entries from the communications profile to their power on values.Either of these reset states may be entered directly at any other time .

In different states various protocols are available to the node, in operational all protocols are available, in Stopped only a limited subset is available, as shown below.

Function	Stopped	Pre operational	operational
NMT	Yes	Yes	Yes
EMCY	No	Yes	Yes
PDO	No	No	Yes
SDO	No	Yes	Yes
GUARD	Yes	Yes	Yes
SYNC	NO	Yes	Yes
TIMESTAMP	NO	Yes	Yes