

Overview

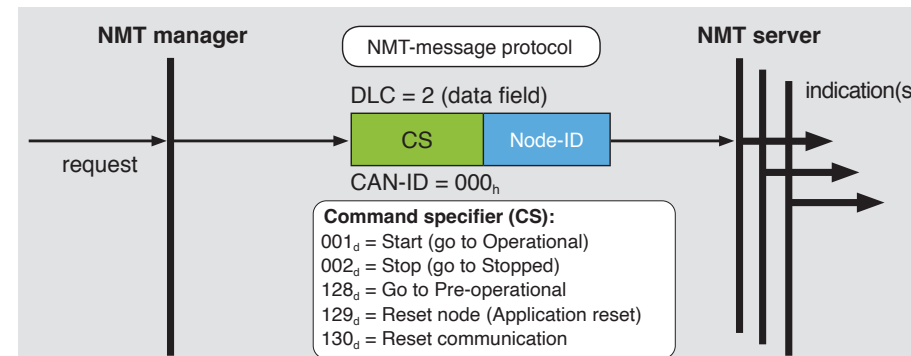
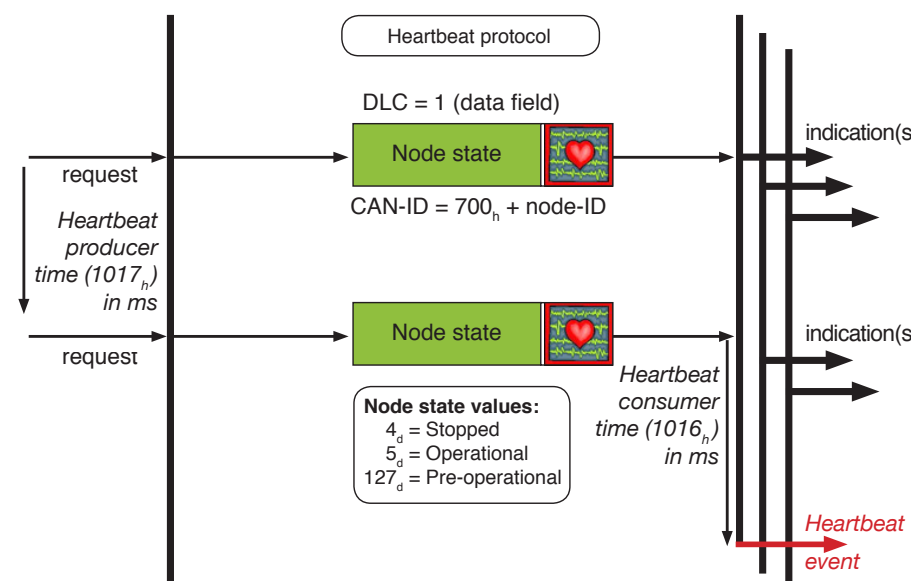
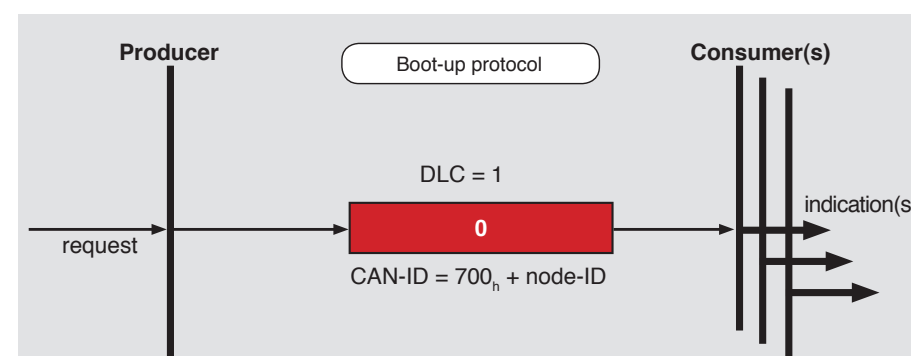
Index range	Description
1000, to 1029 _n	General communication objects (CIA 301)
102A _n	NMT inhibit time (CIA 302-2)
1100, to 1107 _n	CANopen security (CIA 322) (under development)
1180, to 1186 _n	CANopen energy saving (CIA 302-9)
1200, to 12FF _n	SDO parameters (CIA 301)
1300, to 13FF _n	CANopen safety parameters (EN 50325-5)
1400, to 1BFF _n	PDO parameters (CIA 301)
1F00, to 1F11 _n	SDO manager (CIA 302-5)
1F20, to 1F27 _n	Configuration manager (CIA 302-3)
1F2A _n , to 1F4F _n	CANopen multi-level networking (CIA 302-7)
1F50, to 1F58 _n	Program control parameters (CIA 302-3)
1F60 _n	Redundancy configuration (CIA 302-6)
1F70 _n	Process image (CIA 302-4)
1F78 _n	CANopen message data reception (IEC 61375-3-3)
1F80 _n , to 1F91 _n	NMT manager parameters (CIA 302-2)
1FA0 _n , to 1FCF _n	Object scanner list (CIA 301)
1FD0 _n , to 1FFF _n	Object dispatching list (CIA 301)

Communication profile area

Index	Object	Name
1000 _n	VAR	Device type
1001 _n	VAR	Error register
1002 _n	VAR	Manufacturer status register
1003 _n	ARRAY	Pre-defined error field
1005 _n	VAR	COB-ID Sync message
1006 _n	VAR	Communication cycle period
1007 _n	VAR	Synchronous window length
1008 _n	VAR	Manufacturer device name
1009 _n	VAR	Manufacturer hardware version
100A _n	VAR	Manufacturer software version
100C _n	VAR	Guard time
100D _n	VAR	Life time factor
1010 _n	VAR	Store parameters
1011 _n	VAR	Restore default parameters
1012 _n	VAR	COB-ID time stamp
1013 _n	VAR	High resolution time stamp
1014 _n	VAR	COB-ID EMCY
1015 _n	VAR	Inhibit time EMCY
1016 _n	ARRAY	Consumer heartbeat time
1017 _n	VAR	Producer heartbeat time
1018 _n	RECORD	Identity object
1019 _n	VAR	Sync. counter overflow value
1020 _n	ARRAY	Verify configuration
1021 _n	VAR	Store EDS
1022 _n	VAR	Storage format
1023 _n	RECORD	OS command
1024 _n	VAR	OS command mode
1025 _n	RECORD	OS debugger interface
1026 _n	ARRAY	OS prompt
1027 _n	ARRAY	Module list
1028 _n	ARRAY	Emergency consumer
1029 _n	ARRAY	Error behavior

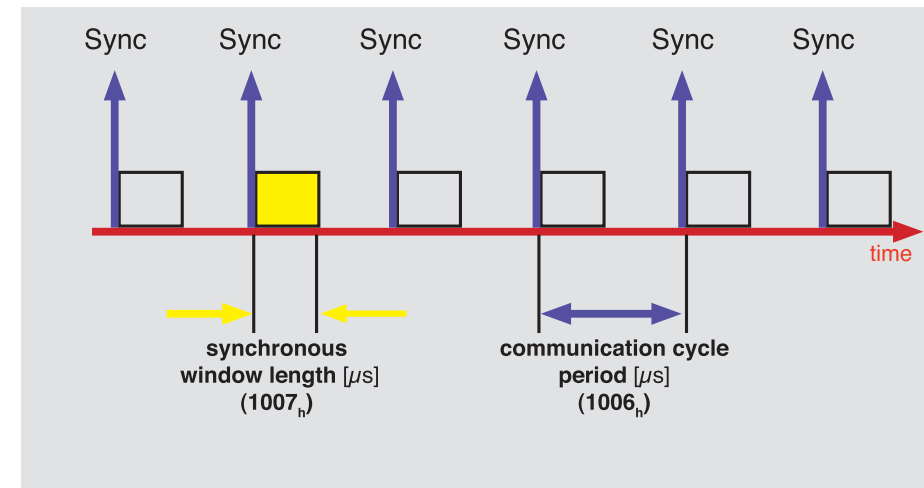
General communication objects

- (1) Power on
- (2) Automatic switch to Pre-operational
- (3) and (6) NMT switch to Operational
- (4) and (7) NMT switch to Pre-operational
- (5) and (8) NMT switch to Stopped
- (9), (10) and (11) NMT switch to Application reset
- (12), (13) and (14) NMT switch to Communication reset
- (15) Power-off or hardware reset

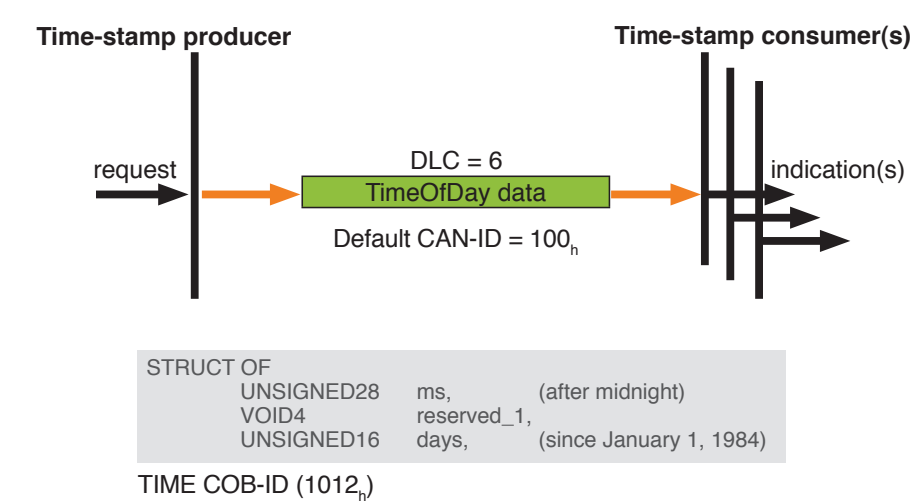


Object	Specification	CAN-ID
NMT	CIA 301	000 _n
Global fail-safe command	EN 50325-5	001 _n
Flying manager	CIA 302-2	071 _n to 076 _n
Indicate active interface	CIA 302-6	07F _n
Sync	CIA 301	080 _n
Emergency	CIA 301	081 _n to 0FF _n (080 _n + node-ID)
Time stamp	CIA 301	100 _n
Stafety-relevant data objects	EN 50325-5	101 _n to 180 _n
TPDO 1	CIA 301	181 _n to 1FF _n (180 _n + node-ID)
RPDO 1	CIA 301	201 _n to 27F _n (200 _n + node-ID)
TPDO 2	CIA 301	281 _n to 2FF _n (280 _n + node-ID)
RPDO 2	CIA 301	301 _n to 37F _n (300 _n + node-ID)

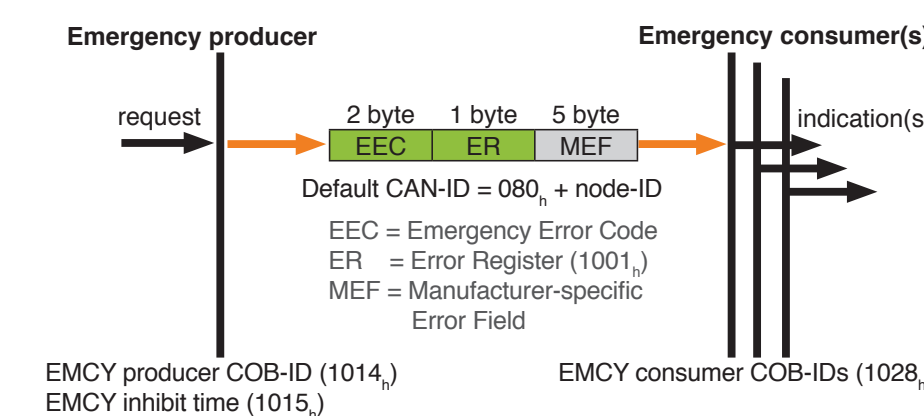
The diagram illustrates the Sync protocol. A **Sync producer** sends a **request** (black arrow) to a **Counter** (green box). The **Counter** has a **DLC = 0 or 1** and a **Default CAN-ID = 080_n**. The **Counter** then sends an **indication(s)** (black arrow) to the **Sync consumer(s)**.



Time-stamp protocol



Emergency protocol



The diagram illustrates the data flow in a CAN bus system. On the left, a vertical line represents the **Producer**. An arrow labeled **request** points to this line. From the Producer, a message is sent to the right. The message is represented by a green box labeled **Application object(s)**. Above this box, it is noted that **DLC = 1 to 8**. Below the box, it is noted that **CAN-ID = pre-defined or user-specific**. On the right, a vertical line represents the **Consumer(s)**. The message from the Producer points to this line. From the Consumer(s), multiple arrows point to the right, labeled **indication(s)**.

PDO communication parameter

Index	Sub-index	Description	Data type
RPDO: 1400 _h to 15FF _h	0 _h	Number of entries	Unsigned8
	01 _h	COB-ID	Unsigned32
	02 _h	Transmission type	Unsigned8
	03 _h	Inhibit time	Unsigned16
TPDO: 1800 _h to 19FF _h	04 _h	Reserved	Unsigned8
	05 _h	Event timer	Unsigned16
	06 _h	SYNC start value	Unsigned8

RPDO parameter

Index **Sub** **Object contents**

1400,	01,	CAN-ID CAN-ID
1400,	02,	Transmission type
1400,	03,	Inhibit time
1400,	05,	Event timer
1600,	01,	2000, 01,
1600,	02,	2003, 03,
1600,	03,	2003, 01,
2000,	01,	Object A
2000,	02,	Object B
2001,	00,	Object C
2002,	00,	Object D
2003,	01,	Object E
2003,	02,	Object F
2003,	03,	Object G

CAN transmission

RPDO 1 (CAN-ID see 1400, 01)

Data field

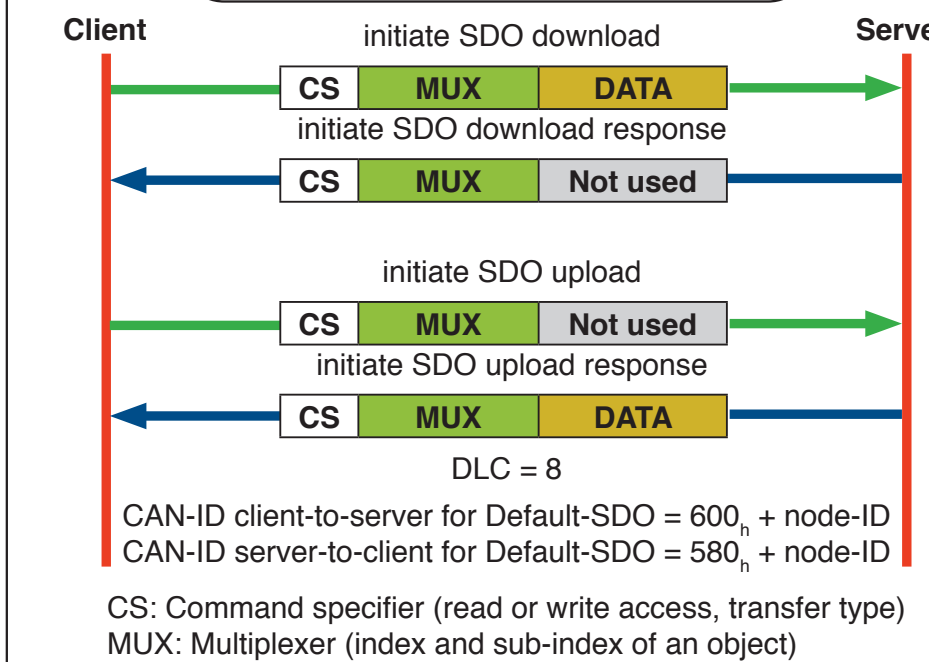
CAN-ID Object A Object G Object F

TPDO parameter

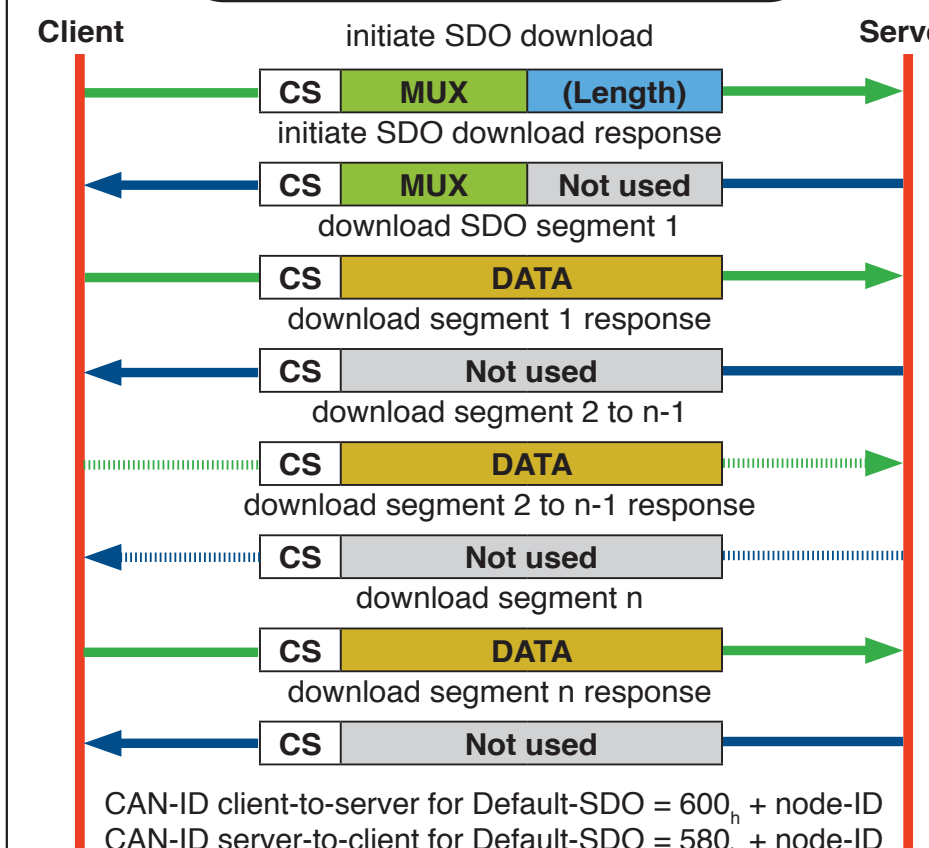
The diagram illustrates the CAN transmission structure and its mapping to object IDs. It shows a CAN transmission frame with a data field containing four objects: CAN-ID, Object A, Object G, and Object . The data field is labeled 'TPDO 1 (CAN-ID see 1800, 01)' and 'Data field'. The CAN-ID is linked to the 'CAN-ID' column in the 'Object contents' table. Object A is linked to the 'Object A' column, Object G to the 'Object G' column, and Object . to the 'Object .' column. The 'Object contents' table lists various objects and their values, including COB-ID, Transmission type, Inhibit time, Event timer, SYNC start value, and various TPDO and RPDO data fields.

Index	Sub	Object contents
1800 _n	01 _n	COB-ID (CAN-ID)
1800 _n	02 _n	Transmission type
1800 _n	03 _n	Inhibit time
1800 _n	05 _n	Event timer
1800 _n	06 _n	SYNC start value
1A00 _n	01 _n	2000 _n , 01 _n , 08 _n
1A00 _n	02 _n	2003 _n , 03 _n , 10 _n
1A00 _n	03 _n	2003 _n , 01 _n , 08 _n
2000 _n	01 _n	Object A
2000 _n	02 _n	Object B
2001 _n	00 _n	Object C
2002 _n	00 _n	Object D
2003 _n	01 _n	Object E
2003 _n	02 _n	Object F
2003 _n	03 _n	Object G

Expedited SDO protocol



Normal SDO protocol



SDO abort codes

Abort code	Description	Abort code	Description
0503 0000	Toggle bit not alternated	0607 0010	Data type does not match, length too short
0504 0000	SDO protocol timeout	0607 0012	Data type does not match, length too high
0504 0001	Client/server command specifier not valid or unknown	0607 0013	Data type does not match, length too low
0504 0002	Invalid block size (block mode only)	0609 0011	Sub-index does not exist
0504 0003	Invalid sequence number (block mode only)	0609 0030	Invalid value for parameter (download only)
0504 0004	CRC error (block mode only)	0609 0031	Value of parameter written too high (download only)
0504 0005	Out of memory	0609 0032	Value of parameter written too low (download only)
0601 0000	Unsupported access to an object	0609 0036	Maximum value is less than minimum value (download only)
0601 0001	Attempt to read a write only object	060A 0023	Resource not available: SDO command
0601 0002	Attempt to write a read only object	060A 0000	General error
0602 0000	Object does not exist in the object dictionary	060B 0020	Data cannot be transferred
0604 0041	Object cannot be mapped to the PDO	060B 0021	Data cannot be transferred or stored
0604 0042	Number, length of the objects would exceed PDO length	060B 0022	Data cannot be transferred because of local constraints
0604 0043	General internal incompatibility reason	060B 0023	Data cannot be transferred because the present device state
0604 0047	General internal incompatibility in the device	060B 0023	Object dictionary dynamic generation fails or no object dictionary is present
0606 0000	Access failed due to an hardware error	060B 0024	No data available



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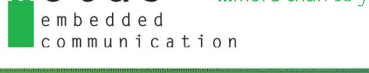
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The logo for MicroControl, featuring the company name in a sans-serif font with a series of orange dots of varying sizes above the 'o's in 'Control'. Below the logo, there are four orange square icons arranged horizontally, each with a white symbol: a factory for 'Protokollstacks Protocol Stacks', two interlocking gears for 'Steuerungen Control Systems', a module with 'I/O' for 'I/O Module I/O Modules', and three stylized human figures for 'Dienstleistungs Services'.



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