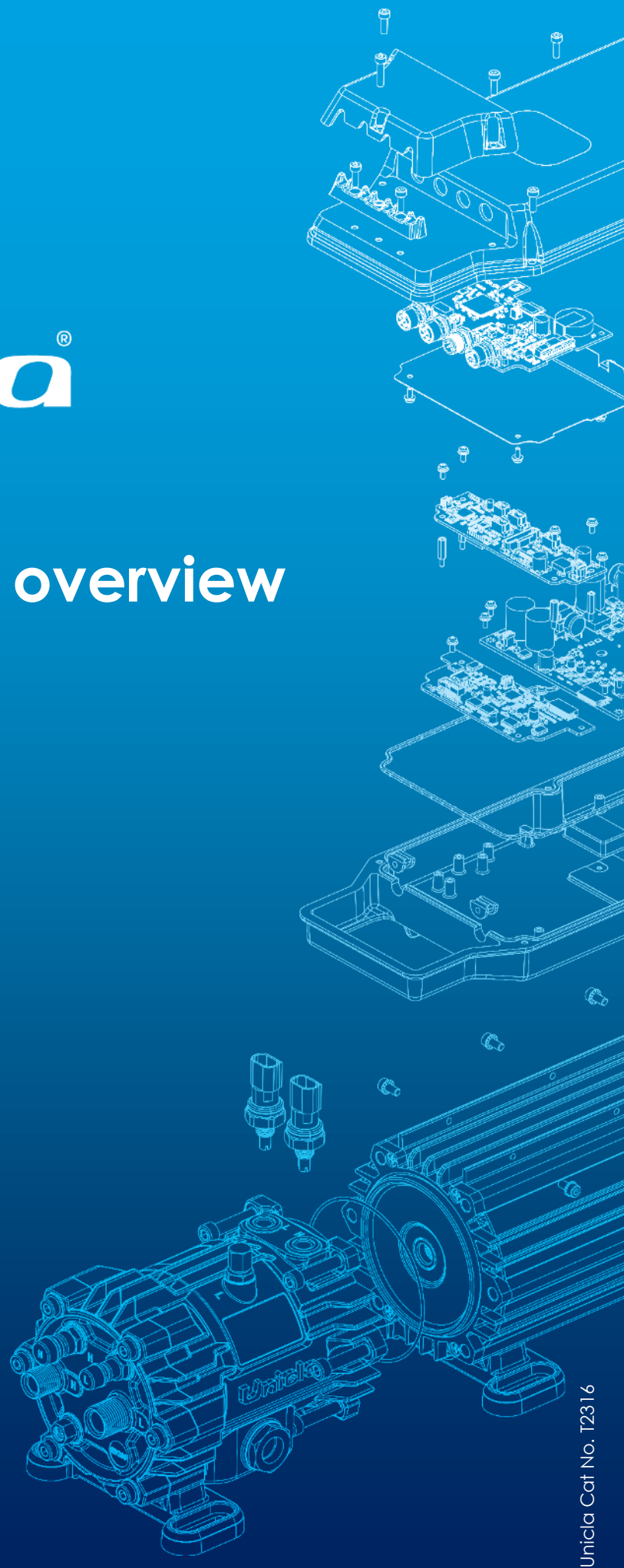
Unicla®

# eDrive CAN overview



Unicla Cat No. T2316

# 1. Introduction

Unicla eDrive CAN is in standard (not CANOpen) format. Data availability is split into two sections – 'periodic' and 'on request.'

# 2. Periodic data

Publish rate is configurable from 200 - 5000ms. 1000ms default which includes critical data, refrigeration and some electrical values

| Name | Type | Units | ID | Payload Bytes | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pressure | array (float) | bar-a | 0x00 | 8 | Suction | | | | Discharge | | | |
| Temperature | array (float) | °C | 0x01 | 8 | Suction | | | | Discharge | | | |
| Superheat | array (float) | K | 0x02 | 8 | Suction | | | | Discharge | | | |
| Compressor/Motor | array (uint16) | … | 0x03 | 8 | RPM | | Voltage (V) | | Power (W) | | Torque (Nm) | |
| Status | array (enum, uint) | … | 0x04 | 8 | Status | | Control Mode | % Demand | Remote Enable | Anti Short Timer (s) | | Reserved |
| Motor Temperatures | array (float) | °C | 0x05 | 8 | Motor | | | | Switch | | | |
| Reserved | | | 0x06 | | | | | | | | | |
| Reserved | | | 0x07 | | | | | | | | | |

## 3. On request data

Available requests are – Build  Information, Running Limits/CAN config, and Commands

### 3.1 Build Information

| Name | Type | Units | ID | Payload Bytes | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model (1 of 2) | ASCII | - | 0x08 | 8 | | | | | | | | |
| Model (2 of 2) | ASCII | - | 0x09 | 8 | | | | | | | | |
| Serial Number (1 of 2) | ASCII | - | 0x0A | 8 | | | | | | | | |
| Serial Number (2 of 2) | ASCII | - | 0x0B | 8 | | | | | | | | |
| Compressor  Build | array (enum.uint) | - | 0x0C | 8 | Refrig | Oil | Reserved | | Min Speed (RPM) | | Max Speed (RPM | |
| Electrical Build | array (uint) | ... | 0x0D | | Operating Voltage (V) | | Power Rating (W) | | Reserved | | | |
| Device Name (1 of 4) | ASCII | - | 0x0E | 8 | | | | | | | | |
| Device Name (2 of 4) | ASCII | - | 0x0F | 8 | | | | | | | | |
| Device Name (3 of 4) | ASCII | - | 0x10 | 8 | | | | | | | | |
| Device Name (4 of 4) | ASCII | - | 0x11 | 8 | | | | | | | | |
| Reserved | | | 0x12 | | | | | | | | | |
| Reserved | | | 0x13 | | | | | | | | | |
| Reserved | | | 0x14 | | | | | | | | | |

## 3.2 Running Limits/ CAN Config

| Name | Type | Units | ID | Payload Bytes | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Speed Control | array (uint) | RPM | 0x15 | 8 | Min Speed | | | | Max Speed | | | |
| Pressure - Suction | array (float) | bar-a | 0x16 | 8 | Low Limit | | | | High Limit | | | |
| Pressure - Discharge | array (float) | bar-a | 0x17 | 8 | Low Limit | | | | High Limit | | | |
| Temperature - Suction | array (float) | °C | 0x18 | 8 | Low Limit | | | | High Limit | | | |
| Temperature - Discharge | array (float) | °C | 0x19 | 8 | Low Limit | | | | High Limit | | | |
| Superheat - Suction | array (float) | K | 0x1A | 8 | Low Limit | | | | High Limit | | | |
| Superheat - Discharge | array (float) | K | 0x1B | 8 | Low Limit | | | | High Limit | | | |
| CAN Config | array | | 0x1C | 8 | Base Message ID | | | | Update rate (ms) | | Reserved | Control Enabled |
| Reserved | | | 0x1D | | | | | | | | | |
| Reserved | | | 0x1E | | | | | | | | | |

## 3.3 Commands

Set Run State requires a 16-bit speed value which needs to be between the configured min and max reported by eDrive. Sending a value of 0 is treated as a stop command.

| Name | Type | ID | Payload Bytes | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Read | array (uint) | 0x 20 | 8 | Group<br>0 = Build Information<br>1 = Running Limits | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Set Run State<br>See note below | array (uint) | 0x 21 | 8 | Speed Value | | 0 | 0 | 0 | 0 | 0 | 0 |
| Acknowledge Faults | array (uint) | 0x 22 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 4. Configurable parameters

The following parameters are settable in the eDrive UDXC module.

| Group Name (Location) | Parameter | Type/ Unit | Default Value | Comments |
|---|---|---|---|---|
| XC Configuration | CAN Enable d | bool | false | Control the availability of the CAN module |
| XC CAN Configuration | CAN Mode | enum | Standard | Options are:<br>• Standard -**Default**<br>• Extended<br>• CANOpen **FUTURE**<br>• J1939 **FUTURE** |
| | CAN Base Messag e ID | uint16 | 0x0200 | This will be 'OR'ed with the param ID above to give the final message ID. See below. |
| | CAN Baud Rate | enum | 125 | Options are:<br>• 125<br>• 250<br>• 500<br>• 1000kbps |
| | CAN Periodi c update | Uint 16/ ms | 1000 | • CAN periodic update rate. 200ms minimum, 5000ms maximum. Set in increments of 100ms?<br>• Internally, the eDrive updates data every 1000ms so setting CAN update rate to 1000ms is recommended. |

# 5. User design information

CAN message ID applies to CAN Standard and Extended modes only. The CAN message is derived as:

## 5.1 Standard CAN

11bit addressing where:

| Bit 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| Reserved for message ID as defined above | | | | | | | Available to be assigned (Base ID) | | | | |

E.g. message id for Status (0x04) with default base id of (0x0200) is 0x0204

| Bit 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Status 0x04 | | | | | | | Base ID 0x0200 | | | | |
| Message ID = 0x204, 0b1000000100 | | | | | | | | | | | |

## 5.2 Extended CAN

Consist of 2x identifies, 11bit addressing and 18-bit. In extended mode, the message id is calculated as above and split into the 11 and 18-bit parts.

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