

MIC Configuration Data

Product: P920690 - MIC5

Revision: 0.9

Date: 2013-12-23

Distribution and release list (alphabetical)

| Name | Company and Department | Rel. | Signature |
|--------|---------------------------|------|-----------|
| <Name> | <Company> <Department> | | |
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History of changes

| Revision | Date | Changes | Author | Status |
|----------|-------------|--|-----------------|--------|
| 0.1 | 2013 -07-15 | Initial Revision | Axel Ludszuweit | Draft |
| 0.2 | 2013 -07-17 | Change cylinder to output in description of secondary voltage calibration Fix creation and copyright date | Axel Ludszuweit | Draft |
| 0.3 | 2013 -07-19 | Fix wrong description of trigger disc type | Axel Ludszuweit | Draft |
| 0.4 | 2013 -08-22 | Add secondary voltage estimation calibration | Axel Ludszuweit | Draft |
| 0.5 | 2013 -08-22 | Add configuration signature | Axel Ludszuweit | Draft |
| 0.6 | 2013-08-29 | Update URL after moving document | Axel Ludszuweit | Draft |
| 0.7 | 2013-11-08 | Add Max Power-On Speed (ID = 0x1E) | Axel Ludszuweit | Draft |
| 0.8 | 2013-11-12 | Add trigger disc type N+1 extended index range | Axel Ludszuweit | Draft |
| 0.9 | 2013-12-23 | Add Secondary Diagnostics Enable (ID = 0x1F) | Axel Ludszuweit | Draft |

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|---------------------------------|---|-----------------------|----------------------------------|
| Author | Ludszuweit, Axel | Inspector | n/a |
| Department | R&D | Department | n/a |
| Signature | | Signature | |
| URL (Revision) | svn://motdev01.motortech.local/development/projects/P920690/trunk/900-Software/910-Requirements/IDValueList/ConfigurationDataMIC5.odt (0.9) | | |
| Creation Date | 2013-07-15 | Status | IUS (Inspected Updated Stored) |

Document Management

Persons authorized to make changes

| Name | Company | Department |
|------|---------|------------|
| | | |
| | | |
| | | |

Tools used for the creation of this document

| Tool | Description | Version |
|-------------|----------------------|---------|
| LibreOffice | Text processing tool | 4.0.4.2 |
| | | |
| | | |

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1 Introduction

For configuration purposes via J1939, Modbus and CANopen the appropriate parameters should be transmitted via a binary file.

All parameters except fieldbus settings which can be configured via MICT should be settable by configuration via binary file.

These document describes these parameters.

Coding and layout of the binary file is not the scope of this document.

1.1 Purpose of this Document

These document describes the above mentioned parameters sent via binary file by Modbus, J1939 or CANopen.

1.2 Further Applicable Documents

svn://motdev01.motortech.local/development/projects/98.007.0244/trunk/900-Software/910-Requirements/J1939/J1939_BinaryFileTransmission.odt

Description of binary file layout and coding schemes

svn://motdev01.motortech.local/development/projects/98.007.0086/trunk/600-Miscellaneous/Id_value_list.odt

Detailed description of coding schem with variable lengths

1.3 Abbreviations

| | |
|------------|---|
| uint8 | 8 bit unsigned integer |
| uint16 | 16 bit unsigned int |
| uint32 | 32 bit unsigned int |
| uint64 | 64 bit unsigned int |
| int8 | 8 bit signed int |
| int16 | 16 bit signed int |
| int32 | 32 bit signed int |
| int64 | 64 bit signed int |
| float32 | IEEE 754 single precision floating point number (32 bits) |
| float64 | IEEE 754 double precision floating point number (64 bits) |
| string[xx] | string with length of xx |
| ID | identifier |

2 Description of Parameter File

2.1 Timing

Motortech deals with time as a steady raise physical size, therefore the following convention must be met if timings are configured via ID value lists:

- negative sign means earlier (*before top dead center* or *advance*)
- positive sign means later (*after top dead center* or *retard*)

The MICT used the terminology described in braces.

2.2 Identifier

The ID consists of index and subindex. The subindex is coded into the six least significant bits 5 to 0 with a range from 0 to 0x3F.

The other 10 most significant bits 15 to 6 build the index with a range from 0 to 0x3FF.

The index can be equated as $ID = 64 * Index + Subindex$.

| | | | | | | | | | | | | | | | |
|---------|----|----|----|----|----|---|---|---|---|----------|---|---|---|---|--------|
| 15(MSB) | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0(LSB) |
| Index | | | | | | | | | | Subindex | | | | | |

The parameter file is a ID value list, the ID (identifier) defines the meaning of the appropriate value.

2.3 Table of configuration data

| ID | Index | | Name | Datatype | Remark |
|-----------------------|-------------|---------------|-------------|----------|--------|
| | Index[15:6] | Subindex[5:0] | | | |
| Configuration General | | | | | |
| 0x0002 | 0x000 | 0x2 | Four Stroke | uint8 | |

| ID | Index | | Name | Datatype | Remark |
|---------------------------------|-------------|---------------|--|------------|--|
| | Index[15:6] | Subindex[5:0] | | | |
| 0x0005 | | 0x5 | Reset Position | float32 | |
| 0x0006 | | 0x6 | Ignition Release Speed | uint16 | |
| 0x0007 | | 0x7 | Security Speed | uint16 | |
| 0x0008 | | 0x8 | Nominal Speed | uint16 | |
| 0x0009 | | 0x9 | Overspeed | uint16 | |
| 0x000A | | 0xA | Analog Current Input Upper Limit | float32 | |
| 0x000B | | 0xB | Analog Current Input Lower Limit | float32 | |
| 0x000C | | 0xC | Analog Current Input Failure Threshold | float32 | |
| 0x000D | | 0xD | Analog Voltage Input Upper Limit | float32 | |
| 0x000E | | 0xE | Analog Voltage Input Lower Limit | float32 | |
| 0x000F | | 0xF | Analog Voltage Input Failure Threshold | float32 | |
| 0x0010 | | 0x10 | Aux Pickup Supply Voltage | float32 | |
| 0x0011 | | 0x11 | Aux Analog Input Supply Voltage | float32 | |
| 0x0012 | | 0x12 | Max Adv Firing Angle Change per Cycle | float32 | |
| 0x0013 | | 0x13 | Max Ret Firing Angle Change per Cycle | float32 | |
| 0x0014 | | 0x14 | Number of Coils per Cylinder | uint8 | |
| 0x0015 | | 0x15 | Cylinder Names Enabled | uint8 | |
| 0x0016 | | 0x16 | Engine Class | uint8 | 0 = inline; 1 = v engine |
| 0x0017 | | 0x17 | Number of Cylinders | uint8 | |
| 0x0018 | | 0x18 | Show Banks in Reverse Order | uint8 | 1 = reversed order |
| 0x001A | | 0x1A | Coil Data | string | |
| 0x001B | | 0x1B | Secondary Short Enable Voltage | uint16 | |
| 0x001C | | 0x1C | Secondary Short Sensitivity | float32 | 0,98 ... 1,02, 1,02 means higher sensitivity |
| 0x001D | | 0x1D | Configuration Signature | uint32 | |
| 0x001E | | 0x1E | Max Power-On Speed | uint16 | |
| 0x001F | | 0x1F | Secondary Diagnostics Enable | uint8 | 0 = disable, 1 = enable |
| Configuration Misc Information | | | | | |
| 0x0041 | 0x001 | 0x1 | Site Description | string[40] | |
| 0x0042 | | 0x2 | Site Location | string[40] | |
| 0x0043 | | 0x3 | Module Description | string[40] | |
| 0x0044 | | 0x4 | Engine Type Description | string[40] | |
| 0x0045 | | 0x5 | Service Contact Line 1 | string[40] | |
| 0x0046 | | 0x6 | Service Contact Line 2 | string[40] | |
| 0x0047 | | 0x7 | Service Contact Line 3 | string[40] | |
| 0x0048 | | 0x8 | Service Contact Line 4 | string[40] | |
| 0x0049 | | 0x9 | Service Contact Line 5 | string[40] | |
| Configuration Number of Outputs | | | | | |
| 0x0081 | 0x002 | 0x1 | Number of Ouputs Bank A | uint8 | |
| 0x0082 | | 0x2 | Number of Ouputs Bank B | uint8 | |
| Configuration Pickup Input 1 | | | | | |
| 0x0401 | 0x010 | 0x1 | Pickup Input Type | uint8 | 0 = passive 1 = active low 2 = active high |
| 0x0402 | | 0x2 | Trigger Disc Type | uint8 | 0 = None 1 = N 2 = N+1 3 = N-1 4 = N magnets 5 = N-2 6 = N+1, extended index range 16 = Pin 32 = single magnet |
| 0x0403 | | 0x3 | Number of Triggers | uint16 | |
| 0x0404 | | 0x4 | Crankshaft Speed | uint8 | 0 = camshaft; 1 = crankshaft speed |
| 0x0405 | | 0x5 | Pre-Trigger Voltage | float32 | |
| Configuration Pickup Input 2 | | | | | |
| 0x0441 | 0x011 | 0x1 | Pickup Input Type | uint8 | 0 = passive 1 = active low 2 = active high |
| 0x0442 | | 0x2 | Trigger Disc Type | uint8 | 0 = None 1 = N |

| ID | Index | | Name | Datatype | Remark |
|-------------------------------|-------------|---------------|--------------------------------------|------------|---|
| | Index[15:6] | Subindex[5:0] | | | |
| | | | | | 2 = N+1 3 = N-1 4 = N magnets 5 = N-2 16 = Pin 32 = single magnet |
| 0x0443 | | 0x3 | Number of Triggers | uint16 | |
| 0x0444 | | 0x4 | Crankshaft Speed | uint8 | 0 = camshaft; 1 = crankshaft speed |
| 0x0445 | | 0x5 | Pre-Trigger Voltage | float32 | |
| Configuration Pickup Input 3 | | | | | |
| 0x0481 | 0x012 | 0x1 | Pickup Input Type | uint8 | 0 = passive 1 = active low 2 = active high |
| 0x0482 | | 0x2 | Trigger Disc Type | uint8 | 0 = None 1 = N 2 = N+1 3 = N-1 4 = N magnets 5 = N-2 16 = Pin 32 = single magnet |
| 0x0483 | | 0x3 | Number of Triggers | uint16 | |
| 0x0484 | | 0x4 | Crankshaft Speed | uint8 | 0 = camshaft; 1 = crankshaft speed |
| 0x0485 | | 0x5 | Pre-Trigger Voltage | float32 | |
| Configuration Cylinder Bank A | | | | | |
| 0x0801 | 0x020 | 0x1 | Bank Name | string[8] | |
| 0x0802 | | 0x2 | Show Cylinders in Reverse Order | uint8 | |
| Configuration Cylinder Bank B | | | | | |
| 0x0841 | 0x021 | 0x1 | Bank Name | string[8] | |
| 0x0842 | | 0x2 | Show Cylinders in Reverse Order | uint8 | |
| Configuration Cylinder Names | | | | | |
| 0x0BC1 | 0x02F | 0x1 | Name of Cylinder 1 | string[4] | |
| 0x0BC2 | | 0x2 | Name of Cylinder 2 | string[4] | |
| 0x0BC3 | | 0x3 | Name of Cylinder 3 | string[4] | |
| 0x0BC4 | | 0x4 | Name of Cylinder 4 | string[4] | |
| 0x0BC5 | | 0x5 | Name of Cylinder 5 | string[4] | |
| 0x0BC6 | | 0x6 | Name of Cylinder 6 | string[4] | |
| 0x0BC7 | | 0x7 | Name of Cylinder 7 | string[4] | |
| 0x0BC8 | | 0x8 | Name of Cylinder 8 | string[4] | |
| 0x0BC9 | | 0x9 | Name of Cylinder 9 | string[4] | |
| 0x0BCA | | 0xA | Name of Cylinder 10 | string[4] | |
| 0x0BCB | | 0xB | Name of Cylinder 11 | string[4] | |
| 0x0BCC | | 0xC | Name of Cylinder 12 | string[4] | |
| 0x0BCD | | 0xD | Name of Cylinder 13 | string[4] | |
| 0x0BCE | | 0xE | Name of Cylinder 14 | string[4] | |
| 0x0BCF | | 0xF | Name of Cylinder 15 | string[4] | |
| 0x0BD0 | | 0x10 | Name of Cylinder 16 | string[4] | |
| 0x0BD1 | | 0x11 | Name of Cylinder 17 | string[4] | |
| 0x0BD2 | | 0x12 | Name of Cylinder 18 | string[4] | |
| 0x0BD3 | | 0x13 | Name of Cylinder 19 | string[4] | |
| 0x0BD4 | | 0x14 | Name of Cylinder 20 | string[4] | |
| 0x0BD5 | | 0x15 | Name of Cylinder 21 | string[4] | |
| 0x0BD6 | | 0x16 | Name of Cylinder 22 | string[4] | |
| 0x0BD7 | | 0x17 | Name of Cylinder 23 | string[4] | |
| 0x0BD8 | | 0x18 | Name of Cylinder 24 | string[4] | |
| Configuration Schedule A | | | | | |
| 0x0C01 | 0x030 | 0x1 | Schedule Enabled | uint8 | 0 = disabled; 1 = enabled |
| 0x0C02 | | 0x2 | Schedule Description | string[20] | |
| 0x0C03 | | 0x3 | Timing Limit Min | float32 | |
| 0x0C04 | | 0x4 | Timing Limit Max | float32 | |
| 0x0C05 | | 0x5 | Cylinder Individual Timing Limit Min | float32 | |

| ID | Index | | Name | Datatype | Remark |
|--|-------------|------------------------------|--|---------------------------|---------------------------|
| | Index[15:6] | Subindex[5:0] | | | |
| 0x0C06 | | 0x6 | Cylinder Individual Timing Limit Max | float32 | |
| 0x0C07 | | 0x7 | Base Timing | float32 | |
| 0x0C08 | | 0x8 | Potentiometer Enabled | uint8 | |
| 0x0C09 | | 0x9 | Potentiometer Timing CW | float32 | |
| 0x0C0A | | 0xA | Potentiometer Timing CCW | float32 | |
| 0x0C0B | | 0xB | Analog Current Input Enabled | uint8 | |
| 0x0C0C | | 0xC | Analog Current Input Timing at Lower Limit | float32 | |
| 0x0C0D | | 0xD | Analog Current Input Timing at Upper Limit | float32 | |
| 0x0C0E | | 0xE | Analog Current Input Timing Default | float32 | |
| 0x0C0F | | 0xF | Analog Voltage Input Enabled | uint8 | |
| 0x0C10 | | 0x10 | Analog Voltage Input Timing at Lower Limit | float32 | |
| 0x0C11 | | 0x11 | Analog Voltage Input Timing at Upper Limit | float32 | |
| 0x0C12 | | 0x12 | Analog Voltage Input Timing Default | float32 | |
| 0x0C13 | | 0x13 | Spark Duration | uint16 | |
| 0x0C14 | | 0x14 | Spark Intensity | uint16 | |
| 0x0C15 | | 0x15 | Max Breakdown Voltage | uint8 | |
| 0x0C16 | | 0x16 | Start Phase Spark Duration | uint16 | |
| 0x0C17 | | 0x17 | Start Phase Spark Intensity | uint16 | |
| 0x0C18 | | 0x18 | Start Phase Max Breakdown Voltage | uint8 | |
| 0x0C19 | | 0x19 | Start Phase Speed Limit | uint16 | |
| 0x0C1A | 0x1A | Start Phase Time Limit | uint32 | | |
| 0x0C1B | 0x1B | Energy Limit | uint16 | | |
| 0x0C1C | 0x1C | Speed Curve Enabled | uint8 | 0 = disabled; 1 = enabled | |
| 0x0C1D | 0x1D | Number of Speed Points | uint8 | | |
| 0x0C1E | 0x1E | Start Phase Energy Limit | uint16 | | |
| Configuration Schedule A Speed Points Speed | | | | | |
| 0x0C41 | 0x031 | 0x1 | Speed of Point 1 | uint16 | |
| 0x0C42 | | 0x2 | Speed of Point 2 | uint16 | |
| 0x0C43 | | 0x3 | Speed of Point 3 | uint16 | |
| 0x0C44 | | 0x4 | Speed of Point 4 | uint16 | |
| 0x0C45 | | 0x5 | Speed of Point 5 | uint16 | |
| 0x0C46 | | 0x6 | Speed of Point 6 | uint16 | |
| 0x0C47 | | 0x7 | Speed of Point 7 | uint16 | |
| 0x0C48 | | 0x8 | Speed of Point 8 | uint16 | |
| Configuration Schedule A Speed Points Timing | | | | | |
| 0x0C81 | 0x032 | 0x1 | Timing of Point 1 | float64 | |
| 0x0C82 | | 0x2 | Timing of Point 2 | float64 | |
| 0x0C83 | | 0x3 | Timing of Point 3 | float64 | |
| 0x0C84 | | 0x4 | Timing of Point 4 | float64 | |
| 0x0C85 | | 0x5 | Timing of Point 5 | float64 | |
| 0x0C86 | | 0x6 | Timing of Point 6 | float64 | |
| 0x0C87 | | 0x7 | Timing of Point 7 | float64 | |
| 0x0C88 | | 0x8 | Timing of Point 8 | float64 | |
| Configuration Schedule B | | | | | |
| 0x1001 | 0x040 | 0x1 | Schedule Enabled | uint8 | 0 = disabled; 1 = enabled |
| 0x1002 | | 0x2 | Schedule Description | string[20] | |
| 0x1003 | | 0x3 | Timing Limit Min | float32 | |
| 0x1004 | | 0x4 | Timing Limit Max | float32 | |
| 0x1005 | | 0x5 | Cylinder Individual Timing Limit Min | float32 | |
| 0x1006 | | 0x6 | Cylinder Individual Timing Limit Max | float32 | |
| 0x1007 | | 0x7 | Base Timing | float32 | |
| 0x1008 | | 0x8 | Potentiometer Enabled | uint8 | |
| 0x1009 | | 0x9 | Potentiometer Timing CW | float32 | |
| 0x100A | | 0xA | Potentiometer Timing CCW | float32 | |
| 0x100B | 0xB | Analog Current Input Enabled | uint8 | | |

| ID | Index | | Name | Datatype | Remark |
|--|-------------|--------------------------|--|----------|---------------------------|
| | Index[15:6] | Subindex[5:0] | | | |
| 0x100C | | 0xC | Analog Current Input Timing at Lower Limit | float32 | |
| 0x100D | | 0xD | Analog Current Input Timing at Upper Limit | float32 | |
| 0x100E | | 0xE | Analog Current Input Timing Default | float32 | |
| 0x100F | | 0xF | Analog Voltage Input Enabled | uint8 | |
| 0x1010 | | 0x10 | Analog Voltage Input Timing at Lower Limit | float32 | |
| 0x1011 | | 0x11 | Analog Voltage Input Timing at Upper Limit | float32 | |
| 0x1012 | | 0x12 | Analog Voltage Input Timing Default | float32 | |
| 0x1013 | | 0x13 | Spark Duration | uint16 | |
| 0x1014 | | 0x14 | Spark Intensity | uint16 | |
| 0x1015 | | 0x15 | Max Breakdown Voltage | uint8 | |
| 0x1016 | | 0x16 | Start Phase Spark Duration | uint16 | |
| 0x1017 | | 0x17 | Start Phase Spark Intensity | uint16 | |
| 0x1018 | | 0x18 | Start Phase Max Breakdown Voltage | uint8 | |
| 0x1019 | | 0x19 | Start Phase Speed Limit | uint16 | |
| 0x101A | | 0x1A | Start Phase Time Limit | uint32 | |
| 0x101B | | 0x1B | Energy Limit | uint16 | |
| 0x101C | | 0x1C | Speed Curve Enabled | uint8 | 0 = disabled; 1 = enabled |
| 0x101D | | 0x1D | Number of Speed Points | uint8 | |
| 0x101E | 0x1E | Start Phase Energy Limit | uint16 | | |
| Configuration Schedule B Speed Points Speed | | | | | |
| 0x1041 | 0x041 | 0x1 | Speed of Point 1 | uint16 | |
| 0x1042 | | 0x2 | Speed of Point 2 | uint16 | |
| 0x1043 | | 0x3 | Speed of Point 3 | uint16 | |
| 0x1044 | | 0x4 | Speed of Point 4 | uint16 | |
| 0x1045 | | 0x5 | Speed of Point 5 | uint16 | |
| 0x1046 | | 0x6 | Speed of Point 6 | uint16 | |
| 0x1047 | | 0x7 | Speed of Point 7 | uint16 | |
| 0x1048 | | 0x8 | Speed of Point 8 | uint16 | |
| Configuration Schedule B Speed Points Timing | | | | | |
| 0x1081 | 0x042 | 0x1 | Timing of Point 1 | float64 | |
| 0x1082 | | 0x2 | Timing of Point 2 | float64 | |
| 0x1083 | | 0x3 | Timing of Point 3 | float64 | |
| 0x1084 | | 0x4 | Timing of Point 4 | float64 | |
| 0x1085 | | 0x5 | Timing of Point 5 | float64 | |
| 0x1086 | | 0x6 | Timing of Point 6 | float64 | |
| 0x1087 | | 0x7 | Timing of Point 7 | float64 | |
| 0x1088 | | 0x8 | Timing of Point 8 | float64 | |
| Configuration Firing Angle 1 | | | | | |
| 0x2001 | 0x080 | 0x1 | Output Bank | uint8 | |
| 0x2002 | | 0x2 | Output | uint8 | |
| 0x2003 | | 0x3 | Firing Angle | float64 | |
| 0x2004 | | 0x4 | Output Delay | uint16 | |
| 0x2005 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 2 | | | | | |
| 0x2041 | 0x081 | 0x1 | Output Bank | uint8 | |
| 0x2042 | | 0x2 | Output | uint8 | |
| 0x2043 | | 0x3 | Firing Angle | float64 | |
| 0x2044 | | 0x4 | Output Delay | uint16 | |
| 0x2045 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 3 | | | | | |
| 0x2081 | 0x082 | 0x1 | Output Bank | uint8 | |
| 0x2082 | | 0x2 | Output | uint8 | |
| 0x2083 | | 0x3 | Firing Angle | float64 | |
| 0x2084 | | 0x4 | Output Delay | uint16 | |
| 0x2085 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |

| ID | Index | | Name | Datatype | Remark |
|-------------------------------|-------------|---------------|----------------|----------|-----------------------|
| | Index[15:6] | Subindex[5:0] | | | |
| Configuration Firing Angle 4 | | | | | |
| 0x20C1 | 0x083 | 0x1 | Output Bank | uint8 | |
| 0x20C2 | | 0x2 | Output | uint8 | |
| 0x20C3 | | 0x3 | Firing Angle | float64 | |
| 0x20C4 | | 0x4 | Output Delay | uint16 | |
| 0x20C5 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 5 | | | | | |
| 0x2101 | 0x084 | 0x1 | Output Bank | uint8 | |
| 0x2102 | | 0x2 | Output | uint8 | |
| 0x2103 | | 0x3 | Firing Angle | float64 | |
| 0x2104 | | 0x4 | Output Delay | uint16 | |
| 0x2105 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 6 | | | | | |
| 0x2141 | 0x085 | 0x1 | Output Bank | uint8 | |
| 0x2142 | | 0x2 | Output | uint8 | |
| 0x2143 | | 0x3 | Firing Angle | float64 | |
| 0x2144 | | 0x4 | Output Delay | uint16 | |
| 0x2145 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 7 | | | | | |
| 0x2181 | 0x086 | 0x1 | Output Bank | uint8 | |
| 0x2182 | | 0x2 | Output | uint8 | |
| 0x2183 | | 0x3 | Firing Angle | float64 | |
| 0x2184 | | 0x4 | Output Delay | uint16 | |
| 0x2185 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 8 | | | | | |
| 0x21C1 | 0x087 | 0x1 | Output Bank | uint8 | |
| 0x21C2 | | 0x2 | Output | uint8 | |
| 0x21C3 | | 0x3 | Firing Angle | float64 | |
| 0x21C4 | | 0x4 | Output Delay | uint16 | |
| 0x21C5 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 9 | | | | | |
| 0x2201 | 0x088 | 0x1 | Output Bank | uint8 | |
| 0x2202 | | 0x2 | Output | uint8 | |
| 0x2203 | | 0x3 | Firing Angle | float64 | |
| 0x2204 | | 0x4 | Output Delay | uint16 | |
| 0x2205 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 10 | | | | | |
| 0x2241 | 0x089 | 0x1 | Output Bank | uint8 | |
| 0x2242 | | 0x2 | Output | uint8 | |
| 0x2243 | | 0x3 | Firing Angle | float64 | |
| 0x2244 | | 0x4 | Output Delay | uint16 | |
| 0x2245 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 11 | | | | | |
| 0x2281 | 0x08A | 0x1 | Output Bank | uint8 | |
| 0x2282 | | 0x2 | Output | uint8 | |
| 0x2283 | | 0x3 | Firing Angle | float64 | |
| 0x2284 | | 0x4 | Output Delay | uint16 | |
| 0x2285 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 12 | | | | | |
| 0x22C1 | 0x08B | 0x1 | Output Bank | uint8 | |
| 0x22C2 | | 0x2 | Output | uint8 | |
| 0x22C3 | | 0x3 | Firing Angle | float64 | |
| 0x22C4 | | 0x4 | Output Delay | uint16 | |
| 0x22C5 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 13 | | | | | |

| ID | Index | | Name | Datatype | Remark |
|-------------------------------|-------------|---------------|----------------|----------|-----------------------|
| | Index[15:6] | Subindex[5:0] | | | |
| 0x2301 | 0x08C | 0x1 | Output Bank | uint8 | |
| 0x2302 | | 0x2 | Output | uint8 | |
| 0x2303 | | 0x3 | Firing Angle | float64 | |
| 0x2304 | | 0x4 | Output Delay | uint16 | |
| 0x2305 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 14 | | | | | |
| 0x2341 | 0x08D | 0x1 | Output Bank | uint8 | |
| 0x2342 | | 0x2 | Output | uint8 | |
| 0x2343 | | 0x3 | Firing Angle | float64 | |
| 0x2344 | | 0x4 | Output Delay | uint16 | |
| 0x2345 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 15 | | | | | |
| 0x2381 | 0x08E | 0x1 | Output Bank | uint8 | |
| 0x2382 | | 0x2 | Output | uint8 | |
| 0x2383 | | 0x3 | Firing Angle | float64 | |
| 0x2384 | | 0x4 | Output Delay | uint16 | |
| 0x2385 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 16 | | | | | |
| 0x23C1 | 0x08F | 0x1 | Output Bank | uint8 | |
| 0x23C2 | | 0x2 | Output | uint8 | |
| 0x23C3 | | 0x3 | Firing Angle | float64 | |
| 0x23C4 | | 0x4 | Output Delay | uint16 | |
| 0x23C5 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 17 | | | | | |
| 0x2401 | 0x090 | 0x1 | Output Bank | uint8 | |
| 0x2402 | | 0x2 | Output | uint8 | |
| 0x2403 | | 0x3 | Firing Angle | float64 | |
| 0x2404 | | 0x4 | Output Delay | uint16 | |
| 0x2405 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 18 | | | | | |
| 0x2441 | 0x091 | 0x1 | Output Bank | uint8 | |
| 0x2442 | | 0x2 | Output | uint8 | |
| 0x2443 | | 0x3 | Firing Angle | float64 | |
| 0x2444 | | 0x4 | Output Delay | uint16 | |
| 0x2445 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 19 | | | | | |
| 0x2481 | 0x092 | 0x1 | Output Bank | uint8 | |
| 0x2482 | | 0x2 | Output | uint8 | |
| 0x2483 | | 0x3 | Firing Angle | float64 | |
| 0x2484 | | 0x4 | Output Delay | uint16 | |
| 0x2485 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 20 | | | | | |
| 0x24C1 | 0x093 | 0x1 | Output Bank | uint8 | |
| 0x24C2 | | 0x2 | Output | uint8 | |
| 0x24C3 | | 0x3 | Firing Angle | float64 | |
| 0x24C4 | | 0x4 | Output Delay | uint16 | |
| 0x24C5 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 21 | | | | | |
| 0x2501 | 0x094 | 0x1 | Output Bank | uint8 | |
| 0x2502 | | 0x2 | Output | uint8 | |
| 0x2503 | | 0x3 | Firing Angle | float64 | |
| 0x2504 | | 0x4 | Output Delay | uint16 | |
| 0x2505 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 22 | | | | | |
| 0x2541 | 0x095 | 0x1 | Output Bank | uint8 | |

| ID | Index | | Name | Datatype | Remark |
|---------------------------------|-------------|---------------|-----------------------------|----------|--|
| | Index[15:6] | Subindex[5:0] | | | |
| 0x2542 | | 0x2 | Output | uint8 | |
| 0x2543 | | 0x3 | Firing Angle | float64 | |
| 0x2544 | | 0x4 | Output Delay | uint16 | |
| 0x2545 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 23 | | | | | |
| 0x2581 | 0x096 | 0x1 | Output Bank | uint8 | |
| 0x2582 | | 0x2 | Output | uint8 | |
| 0x2583 | | 0x3 | Firing Angle | float64 | |
| 0x2584 | | 0x4 | Output Delay | uint16 | |
| 0x2585 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration Firing Angle 24 | | | | | |
| 0x25C1 | 0x097 | 0x1 | Output Bank | uint8 | |
| 0x25C2 | | 0x2 | Output | uint8 | |
| 0x25C3 | | 0x3 | Firing Angle | float64 | |
| 0x25C4 | | 0x4 | Output Delay | uint16 | |
| 0x25C5 | | 0x5 | Cylinder Index | uint16 | 0xFFFF = not assigned |
| Configuration ASO1 General | | | | | |
| 0x4001 | 0x100 | 0x1 | Number of Points | uint8 | |
| 0x4002 | | 0x2 | Global Timing Point Related | uint8 | 0 = absolute timing; 1 = global timing point related |
| Configuration ASO1 Angles | | | | | |
| 0x4041 | 0x101 | 0x1 | ASO Angle 1 | float64 | |
| 0x4042 | | 0x2 | ASO Angle 2 | float64 | |
| 0x4043 | | 0x3 | ASO Angle 3 | float64 | |
| 0x4044 | | 0x4 | ASO Angle 4 | float64 | |
| 0x4045 | | 0x5 | ASO Angle 5 | float64 | |
| 0x4046 | | 0x6 | ASO Angle 6 | float64 | |
| 0x4047 | | 0x7 | ASO Angle 7 | float64 | |
| 0x4048 | | 0x8 | ASO Angle 8 | float64 | |
| 0x4049 | | 0x9 | ASO Angle 9 | float64 | |
| 0x404A | | 0xA | ASO Angle 10 | float64 | |
| 0x404B | | 0xB | ASO Angle 11 | float64 | |
| 0x404C | | 0xC | ASO Angle 12 | float64 | |
| 0x404D | | 0xD | ASO Angle 13 | float64 | |
| 0x404E | | 0xE | ASO Angle 14 | float64 | |
| 0x404F | | 0xF | ASO Angle 15 | float64 | |
| 0x4050 | | 0x10 | ASO Angle 16 | float64 | |
| 0x4051 | | 0x11 | ASO Angle 17 | float64 | |
| 0x4052 | | 0x12 | ASO Angle 18 | float64 | |
| 0x4053 | | 0x13 | ASO Angle 19 | float64 | |
| 0x4054 | | 0x14 | ASO Angle 20 | float64 | |
| 0x4055 | | 0x15 | ASO Angle 21 | float64 | |
| 0x4056 | | 0x16 | ASO Angle 22 | float64 | |
| 0x4057 | | 0x17 | ASO Angle 23 | float64 | |
| 0x4058 | | 0x18 | ASO Angle 24 | float64 | |
| Configuration ASO1 Pulse Widths | | | | | |
| 0x4081 | 0x102 | 0x1 | ASO Pulse Width 1 | uint16 | |
| 0x4082 | | 0x2 | ASO Pulse Width 2 | uint16 | |
| 0x4083 | | 0x3 | ASO Pulse Width 3 | uint16 | |
| 0x4084 | | 0x4 | ASO Pulse Width 4 | uint16 | |
| 0x4085 | | 0x5 | ASO Pulse Width 5 | uint16 | |
| 0x4086 | | 0x6 | ASO Pulse Width 6 | uint16 | |
| 0x4087 | | 0x7 | ASO Pulse Width 7 | uint16 | |
| 0x4088 | | 0x8 | ASO Pulse Width 8 | uint16 | |
| 0x4089 | | 0x9 | ASO Pulse Width 9 | uint16 | |
| 0x408A | | 0xA | ASO Pulse Width 10 | uint16 | |

| ID | Index | | Name | Datatype | Remark |
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| 0x408B | | 0xB | ASO Pulse Width 11 | uint16 | |
| 0x408C | | 0xC | ASO Pulse Width 12 | uint16 | |
| 0x408D | | 0xD | ASO Pulse Width 13 | uint16 | |
| 0x408E | | 0xE | ASO Pulse Width 14 | uint16 | |
| 0x408F | | 0xF | ASO Pulse Width 15 | uint16 | |
| 0x4090 | | 0x10 | ASO Pulse Width 16 | uint16 | |
| 0x4091 | | 0x11 | ASO Pulse Width 17 | uint16 | |
| 0x4092 | | 0x12 | ASO Pulse Width 18 | uint16 | |
| 0x4093 | | 0x13 | ASO Pulse Width 19 | uint16 | |
| 0x4094 | | 0x14 | ASO Pulse Width 20 | uint16 | |
| 0x4095 | | 0x15 | ASO Pulse Width 21 | uint16 | |
| 0x4096 | | 0x16 | ASO Pulse Width 22 | uint16 | |
| 0x4097 | | 0x17 | ASO Pulse Width 23 | uint16 | |
| 0x4098 | | 0x18 | ASO Pulse Width 24 | uint16 | |
| Configuration Alarm 1 | | | | | |
| 0x4801 | 0x120 | 1 | Description | string[20] | |
| 0x4802 | | 2 | Function | uint16 | |
| 0x4803 | | 3 | Threshold | float32 | |
| 0x4804 | | 4 | Hysteresis | float32 | |
| 0x4805 | | 5 | Delay | uint32 | |
| 0x4806 | | 6 | Flags | uint32 | |
| 0x4807 | | 7 | Outputs | uint32 | |
| Configuration Alarm 2 | | | | | |
| 0x4841 | 0x121 | 1 | Description | string[20] | |
| 0x4842 | | 2 | Function | uint16 | |
| 0x4843 | | 3 | Threshold | float32 | |
| 0x4844 | | 4 | Hysteresis | float32 | |
| 0x4845 | | 5 | Delay | uint32 | |
| 0x4846 | | 6 | Flags | uint32 | |
| 0x4847 | | 7 | Outputs | uint32 | |
| Configuration Alarm 3 | | | | | |
| 0x4881 | 0x122 | 1 | Description | string[20] | |
| 0x4882 | | 2 | Function | uint16 | |
| 0x4883 | | 3 | Threshold | float32 | |
| 0x4884 | | 4 | Hysteresis | float32 | |
| 0x4885 | | 5 | Delay | uint32 | |
| 0x4886 | | 6 | Flags | uint32 | |
| 0x4887 | | 7 | Outputs | uint32 | |
| Configuration Alarm 4 | | | | | |
| 0x48C1 | 0x123 | 1 | Description | string[20] | |
| 0x48C2 | | 2 | Function | uint16 | |
| 0x48C3 | | 3 | Threshold | float32 | |
| 0x48C4 | | 4 | Hysteresis | float32 | |
| 0x48C5 | | 5 | Delay | uint32 | |
| 0x48C6 | | 6 | Flags | uint32 | |
| 0x48C7 | | 7 | Outputs | uint32 | |
| Configuration Alarm 5 | | | | | |
| 0x4901 | 0x124 | 1 | Description | string[20] | |
| 0x4902 | | 2 | Function | uint16 | |
| 0x4903 | | 3 | Threshold | float32 | |
| 0x4904 | | 4 | Hysteresis | float32 | |
| 0x4905 | | 5 | Delay | uint32 | |
| 0x4906 | | 6 | Flags | uint32 | |
| 0x4907 | | 7 | Outputs | uint32 | |
| Configuration Alarm 6 | | | | | |

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| 0x4941 | 0x125 | 1 | Description | string[20] | |
| 0x4942 | | 2 | Function | uint16 | |
| 0x4943 | | 3 | Threshold | float32 | |
| 0x4944 | | 4 | Hysteresis | float32 | |
| 0x4945 | | 5 | Delay | uint32 | |
| 0x4946 | | 6 | Flags | uint32 | |
| 0x4947 | | 7 | Outputs | uint32 | |
| Configuration Alarm 7 | | | | | |
| 0x4981 | 0x126 | 1 | Description | string[20] | |
| 0x4982 | | 2 | Function | uint16 | |
| 0x4983 | | 3 | Threshold | float32 | |
| 0x4984 | | 4 | Hysteresis | float32 | |
| 0x4985 | | 5 | Delay | uint32 | |
| 0x4986 | | 6 | Flags | uint32 | |
| 0x4987 | | 7 | Outputs | uint32 | |
| Configuration Alarm 8 | | | | | |
| 0x49C1 | 0x127 | 1 | Description | string[20] | |
| 0x49C2 | | 2 | Function | uint16 | |
| 0x49C3 | | 3 | Threshold | float32 | |
| 0x49C4 | | 4 | Hysteresis | float32 | |
| 0x49C5 | | 5 | Delay | uint32 | |
| 0x49C6 | | 6 | Flags | uint32 | |
| 0x49C7 | | 7 | Outputs | uint32 | |
| Configuration Alarm 9 | | | | | |
| 0x4A01 | 0x128 | 1 | Description | string[20] | |
| 0x4A02 | | 2 | Function | uint16 | |
| 0x4A03 | | 3 | Threshold | float32 | |
| 0x4A04 | | 4 | Hysteresis | float32 | |
| 0x4A05 | | 5 | Delay | uint32 | |
| 0x4A06 | | 6 | Flags | uint32 | |
| 0x4A07 | | 7 | Outputs | uint32 | |
| Configuration Alarm 10 | | | | | |
| 0x4A41 | 0x129 | 1 | Description | string[20] | |
| 0x4A42 | | 2 | Function | uint16 | |
| 0x4A43 | | 3 | Threshold | float32 | |
| 0x4A44 | | 4 | Hysteresis | float32 | |
| 0x4A45 | | 5 | Delay | uint32 | |
| 0x4A46 | | 6 | Flags | uint32 | |
| 0x4A47 | | 7 | Outputs | uint32 | |
| Configuration Alarm 11 | | | | | |
| 0x4A81 | 0x12A | 1 | Description | string[20] | |
| 0x4A82 | | 2 | Function | uint16 | |
| 0x4A83 | | 3 | Threshold | float32 | |
| 0x4A84 | | 4 | Hysteresis | float32 | |
| 0x4A85 | | 5 | Delay | uint32 | |
| 0x4A86 | | 6 | Flags | uint32 | |
| 0x4A87 | | 7 | Outputs | uint32 | |
| Configuration Alarm 12 | | | | | |
| 0x4AC1 | 0x12B | 1 | Description | string[20] | |
| 0x4AC2 | | 2 | Function | uint16 | |
| 0x4AC3 | | 3 | Threshold | float32 | |
| 0x4AC4 | | 4 | Hysteresis | float32 | |
| 0x4AC5 | | 5 | Delay | uint32 | |
| 0x4AC6 | | 6 | Flags | uint32 | |
| 0x4AC7 | | 7 | Outputs | uint32 | |

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| Configuration Alarm 13 | | | | | |
| 0x4B01 | 0x12C | 1 | Description | string[20] | |
| 0x4B02 | | 2 | Function | uint16 | |
| 0x4B03 | | 3 | Threshold | float32 | |
| 0x4B04 | | 4 | Hysteresis | float32 | |
| 0x4B05 | | 5 | Delay | uint32 | |
| 0x4B06 | | 6 | Flags | uint32 | |
| 0x4B07 | | 7 | Outputs | uint32 | |
| Configuration Alarm 14 | | | | | |
| 0x4B41 | 0x12D | 1 | Description | string[20] | |
| 0x4B42 | | 2 | Function | uint16 | |
| 0x4B43 | | 3 | Threshold | float32 | |
| 0x4B44 | | 4 | Hysteresis | float32 | |
| 0x4B45 | | 5 | Delay | uint32 | |
| 0x4B46 | | 6 | Flags | uint32 | |
| 0x4B47 | | 7 | Outputs | uint32 | |
| Configuration Alarm 15 | | | | | |
| 0x4B81 | 0x12E | 1 | Description | string[20] | |
| 0x4B82 | | 2 | Function | uint16 | |
| 0x4B83 | | 3 | Threshold | float32 | |
| 0x4B84 | | 4 | Hysteresis | float32 | |
| 0x4B85 | | 5 | Delay | uint32 | |
| 0x4B86 | | 6 | Flags | uint32 | |
| 0x4B87 | | 7 | Outputs | uint32 | |
| Configuration Alarm 16 | | | | | |
| 0x4BC1 | 0x12F | 1 | Description | string[20] | |
| 0x4BC2 | | 2 | Function | uint16 | |
| 0x4BC3 | | 3 | Threshold | float32 | |
| 0x4BC4 | | 4 | Hysteresis | float32 | |
| 0x4BC5 | | 5 | Delay | uint32 | |
| 0x4BC6 | | 6 | Flags | uint32 | |
| 0x4BC7 | | 7 | Outputs | uint32 | |
| Configuration GPOs Normally Open | | | | | |
| 0x5001 | 0x140 | 1 | GPI1 Normally Open | uint8 | 0 = normally closed; 1 = normally opened |
| Configuration GPI Modes | | | | | |
| 0x5041 | 0x141 | 1 | GPO Mode | uint8 | 0 = disabled; 1 = CAN reset(1 s pulse); device reset (5 s pulse) |
| Configuration Secondary Voltage Estimation Calibration Bank A | | | | | |
| 0x5401 | 0x150 | 1 | Output 1 | float32 | -5,0 ... + 5,0 |
| 0x5402 | | 2 | Output 2 | float32 | |
| 0x5403 | | 3 | Output 3 | float32 | |
| 0x5404 | | 4 | Output 4 | float32 | |
| 0x5405 | | 5 | Output 5 | float32 | |
| 0x5406 | | 6 | Output 6 | float32 | |
| 0x5407 | | 7 | Output 7 | float32 | |
| 0x5408 | | 8 | Output 8 | float32 | |
| 0x5409 | | 9 | Output 9 | float32 | |
| 0x540A | | A | Output 10 | float32 | |
| 0x540B | | B | Output 11 | float32 | |
| 0x540C | | C | Output 12 | float32 | |
| Configuration Secondary Voltage Estimation Calibration Bank B | | | | | |
| 0x5441 | 0x151 | 1 | Output 1 | float32 | -5,0 ... + 5,0 |
| 0x5442 | | 2 | Output 2 | float32 | |
| 0x5443 | | 3 | Output 3 | float32 | |
| 0x5444 | | 4 | Output 4 | float32 | |

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| 0x5445 | | 5 | Output 5 | float32 | |
| 0x5446 | | 6 | Output 6 | float32 | |
| 0x5447 | | 7 | Output 7 | float32 | |
| 0x5448 | | 8 | Output 8 | float32 | |
| 0x5449 | | 9 | Output 9 | float32 | |
| 0x544A | | A | Output 10 | float32 | |
| 0x544B | | B | Output 11 | float32 | |
| 0x544C | | C | Output 12 | float32 | |