

Device Net™ MFC Series

Device Net Communication Specification Sheet

1. Instruction

This manual includes the DeviceNet™ commands for DeviceNet™ MFC series. All default parameters for using DeviceNet™ are regulated. In addition to the DeviceNet commands which are necessary for DeviceNet™ MFC regulated by ODVA, optional commands are added to this manual as well. This manual combines specifications of the units which are applicable to optional commands.

Please find below table for contents of all codes.

Contents	
0x****	Hexadecimal
INT	16bit Signed Integer Type
UINT	16bit Unsigned Integer Type
USINT	8bit Unsigned Integer Type
UDINT	32bit Unsigned Integer Type
ULINT	64bit Unsigned Integer Type
REAL	32bit floating point Type
BYTE	1Byte(8bit) Data Type, Define meaning one of one bit
WORD	2Byte(16bit)Data Type, Define meaning one of one bit
BOOL	Boolean Type (TRUE = 1, FALSE = 0)
STRING	String Type
Get/Set	Get: Readable, Set: Writable

2. Features

- (1) Group 2 only functions as server device. (UCMM not implemented)
- (2) Support 2 types of communication. (Explicit, I/O connection)
- (3) MAC ID: 0 to 63 are available.
- (4) Speed: 125, 250, 500kbps are available.

3. Default setting

Default settings are following below table.

Item	Value	Note
MAC ID (Rotary Switch)	63	Address(MSD) = a Address(LSD) = b MacID = (10a + b) MacID = 64 or more is Software Set Mode
Communication Speed (Rotary Switch)	500Kbps	1 : 125Kbps 2 : 250Kbps 5 : 500Kbps Other: Software Set
I/O Assembly Input Instance (Connection object Instance2 Attribute14)	2	
I/O Assembly Output Instance (Connection object Instance2 Attribute16)	7	
Full Scale (S-Analog Sensor object Instance1 Attribute10)	0x6000 (=24576)	
Data Type (S-Analog Sensor object Instance1 Attribute3) (S-Analog Actuator object Instance1 Attribute3) (S-Single Stage Controller object Instance1 Attribute3)	INT (=0xC3)	
Data Units (S-Analog Sensor object Instance1 Attribute4) (S-Analog Actuator object Instance1 Attribute4) (S-Single Stage Controller object Instance1 Attribute4)	Counts (=0x1001)	

4. DeviceNet Command Message Types

4.1. Identity Object Class (Class Code: 0x01)

4.1.1. Class Attribute

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Revision	Get	UINT	0x0001	Revision Number of Identity Object
2	Max Instance	Get	UINT	0x0001	Max Instance Number of Class
6	Max Class Attribute	Get	UINT	0x0007	Max Attribute Number of Class
7	Max Instance attribute	Get	UINT	0x0007	Last Maximum Attribute Number of Class

4.1.2. Instance1

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Vender ID	Get	UINT	0x0190	ODVA vender ID for Lintec
2	Device Type	Get	UINT	0x001A	MFC Device
3	Product Code	Get	UINT	0x0002 / 0x0004	MC-5000L Series = 0x0002 LC-5000L Series = 0x0004
4	Revision	Get	STRUCT of	*****	e.g. 0x01
	#1. Major		USINT		
	#2. Minor		USINT		
5	Status	Get	WORD	0x0000	bit0 : Owned bit1 : Reserved bit2 : Configured bit3 : Reserved bit4 to 7 : Vendor Specific bit8 : Minor recoverable fault : Dip Switch Zero Offset 100mV bit9 : Minor unrecoverable fault :Null bit10 : Major recoverable fault : Zero Offset 200mV bit11 : Major unrecoverable fault :Null bit12 to 15 : Reserved
6	Serial Number	Get	UDINT	*****	
7	Product Name	Get	STRING	'MC-5000L' 'LC-5000L'	MC-5000L Series LC-5000L Series

Supported Services

Service Name	Class	Instance	Service code	Note
Reset	No	Yes	0x05	0x00 : Device Reset 0x01 : Set to Shipping and Device Reset
Get_Attribute_Single	Yes	Yes	0x0E	Read

4.2. Router Object Class (Class Code : 0x02)

4.2.1. Class Attribute

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Revision	Get	UINT	0x0001	Revision Number of Identity Object
6	Max Class Attribute	Get	UINT	0x0007	Max Attribute Number of Class
7	Max Instance attribute	Get	UINT	0x0002	Last Maximum Attribute Number of Class

4.2.2. Instance1

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
2	Number Available	Get	UINT	0x0002	

Supported Services

Service Name	Class	Instance	Service code	Note
Get_Attribute_Single	Yes	Yes	0x0E	Read

4.3. DeviceNet Object Class (Class Code : 0x03)

4.3.1. Class Attribute

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Revision	Get	UINT	0x0002	Revision Number of Identity Object
2	Max Instance	Get	UINT	0x0001	Max Instance Number of Class
6	Max Class Attribute	Get	UINT	0x0007	Max Attribute Number of Class
7	Max Instance attribute	Get	UINT	0x0009	Last Maximum Attribute Number of Class

4.3.2. Instance1

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	MAC ID	Get/Set	USINT	0x3F	Range: 0x00 to 0x3F ※ Rewritable except when the rotary switch value is in the range 0 to 63
2	Baud Rate	Get/Set	USINT	0x02	Range: 0x00 to 0x02 ※ Rewritable except when the rotary switch value is in the range 0 to 02
3	Bus off interrupt	Get	BOOL	FALSE	FALSE: Bus off of State TRUE : CAN Controller Reset
4	Bus off counter	Get	USINT	0x00	Range: 0 to 255 Counts of Bus off
5	Allocation Information	Get	STRUCT of		
	#1. Allocation choice Byte		BYTE	0x00	
	#2. Master's MAC ID		USINT	0xFF	
6	MAC ID Switch Changed	Get	BOOL	FALSE	FALSE (Not Changed) /TRUE (Changed)
7	Baud Rate Switch Changed	Get	BOOL	FALSE	FALSE (Not Changed) /TRUE (Changed)
8	MAC ID Switch Value	Get	USINT	Currently Value of Switch	Range : 0x00 to 0x63 Switch Value of MAC ID
9	Baud Rate Switch Value	Get	USINT	Currently Value of Switch	Range : 0x00 to 0x09 Switch Value of Baud Rate

Supported Services

Service Name	Class	Instance	Service code	Note
Get_Attribute_Single	Yes	Yes	0x0E	Read
Set_Attribute_Single	No	Yes	0x10	Write
Allocate_Master/ Slave Connection_Set	No	Yes	0x4B	Allocate Master /Slave Connection_Set
Release_Master/ Slave Connection_Set	No	Yes	0x4C	Release Master /Slave Connection_Set

4.4. Assembly Object (Class Code : 0x04)

4.4.1. Class Attribute

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Revision	Get	UINT	0x0002	Revision Number of Identity Object
2	Max Instance	Get	UINT	0x0014	

4.4.2. Instance1

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Analog Sensor, Attribute 6
	#1. Flow		INT	0x0000	

4.4.3. Instance2

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Device Supervisor, Attribute 12
	#1. Status		BYTE	0x00	
	#2. Flow		INT	0x0000	

4.4.4. Instance3

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Device Supervisor, Attribute 12
	#1. Status		BYTE	0x00	
	#2. Flow		INT	0x0000	
	#3. Valve		INT	0x0000	

4.4.5. Instance4

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Device Supervisor, Attribute 12
	#1. Status		BYTE	0x00	
	#2. Flow		INT	0x0000	
	#3. Setpoint		INT	0x0000	

4.4.6. Instance5

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Device Supervisor, Attribute 12
	#1. Status		BYTE	0x00	
	#2. Flow		INT	0x0000	
	#3. Setpoint		INT	0x0000	
	#4. Valve		INT	0x0000	

4.4.7. Instance6

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Device Supervisor, Attribute 12
	#1. Status		BYTE	0x00	
	#2. Flow		INT	0x0000	
	#3. Setpoint		INT	0x0000	
	#4. Override		USINT	0x00	
	#5. Valve		INT	0x0000	

4.4.8. Instance7

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get/Set	STRUCT of		S-Single Stage Controller, Attribute 6
	#1. Setpoint		INT	0x0000	

4.4.9. Instance8

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get/Set	STRUCT of		S-Analog Actuator, Attribute 5
	#1. Override		USINT	0x00	
	#2. Setpoint		INT	0x0000	

4.4.10. Instance9

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Device Supervisor, Attribute 12
	#1. Status		BYTE	0x00	

4.4.11. Instance10

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Device Supervisor, Attribute 12
	#1. Status		BYTE	0x00	
	#2. Exception Detail Alarm		STRUCT		

4.4.12. Instance11

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Device Supervisor, Attribute 12
	#1. Status		BYTE	0x00	
	#2. Exception Detail Warning		STRUCT		

4.4.13. Instance13

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Analog Sensor, Attribute 6
	#1. FP-Flow		REAL	0x0000	

4.4.14. Instance14

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		S-Device Supervisor, Attribute 12
	#1. Status		BYTE	0x00	
	#2. FP-Flow		REAL	0x0000	

4.4.15. Instance15

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		
	#1. Status		BYTE	0x00	S-Device Supervisor, Attribute 12
	#2. FP-Flow		REAL	0x0000	S-Analog Sensor, Attribute 6
	#3. FP-Valve		REAL	0x0000	S-Analog Actuator, Attribute 6

4.4.16. Instance16

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		
	#1. Status		BYTE	0x00	S-Device Supervisor, Attribute 12
	#2. FP-Flow		REAL	0x0000	S-Analog Sensor, Attribute 6
	#3. FP-Setpoint		REAL	0x0000	S-Single Stage Controller, Attribute 6

4.4.17. Instance17

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		
	#1. Status		BYTE	0x00	S-Device Supervisor, Attribute 12
	#2. FP-Flow		REAL	0x0000	S-Analog Sensor, Attribute 6
	#3. FP-Setpoint		REAL	0x0000	S-Single Stage Controller, Attribute 6
	#4. FP-Valve		REAL	0x0000	S-Analog Actuator, Attribute 6

4.4.18. Instance18

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get	STRUCT of		
	#1. Status		BYTE	0x00	S-Device Supervisor, Attribute 12
	#2. FP-Flow		REAL	0x0000	S-Analog Sensor, Attribute 6
	#3. FP-Setpoint		REAL	0x0000	S-Single Stage Controller, Attribute 6
	#4. Override		USINT	0x00	S-Analog Actuator, Attribute 5
	#5. FP-Valve		REAL	0x0000	S-Analog Actuator, Attribute 6

4.4.19. Instance19

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get/Set	STRUCT of		
	#1. FP-Setpoint		REAL	0x0000	S-Single Stage Controller, Attribute 6

4.4.20. Instance20

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data	Get/Set	STRUCT of		
	#1. Override		USINT	0x00	S-Analog Actuator, Attribute 5
	#2. FP-Setpoint		REAL	0x0000	S-Single Stage Controller, Attribute 6

Supported Services

Service Name	Class	Instance	Service code	Note
Get_Attribute_Single	Yes	Yes	0x0E	Read
Set_Attribute_Single	No	Yes	0x10	Write

Available Instances for DeviceNet™ MFC series

4.4.21. INPUT

Instance Number	Data Type	Data
1	INT	Flow
2	INT	Status and Flow
3	INT	Status, Flow and Valve
4	INT	Status, Flow and Setpoint
5	INT	Status, Flow, Setpoint and Valve
6	INT	Status, Flow, Setpoint, Override and Valve
9		Status
10		Status and Exception Detail Alarm
11		Status and Exception Detail Warning
13	REAL	FP-Flow
14	REAL	Status and FP-Flow
15	REAL	Status, FP-Flow and FP-Valve
16	REAL	Status, FP-Flow, and FP-Setpoint
17	REAL	Status, FP-Flow, FP-Setpoint and FP-Valve
18	REAL	Status, FP-Flow, FP-Setpoint, Override and FP-Valve

4.4.22. OUTPUT

Instance Number	Data Type	Data
7	INT	Setpoint
8	INT	Override and Setpoint
19	REAL	FP-Setpoint
20	REAL	Override and FP-Setpoint

4.4.23. Instance Setting Union Correspondence Table

Instance	Instance Number	Instance Number OUTPUT			
		7	8	19	20
Instance Number INPUT	1	✓	✓	✓	✓
	2	✓	✓	✓	✓
	3	✓	✓	✓	✓
	4	✓	✓		
	5	✓	✓		
	6	✓	✓		
	9	✓	✓	✓	✓
	10	✓	✓	✓	✓
	11	✓	✓	✓	✓
	13	✓	✓	✓	✓
	14	✓	✓	✓	✓
	15	✓	✓	✓	✓
	16			✓	✓
	17			✓	✓
	18			✓	✓

※MFC is compatible with checked instance number.

4.5. Connection object Class (Class Code : 0x05)

4.5.1. Class Attribute

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Revision	Get	UINT	0x0001	Revision Number of Identity Object
2	Max Instance	Get	UINT	0x0002	Max Instance Number of Class
6	Max Class Attribute	Get	UINT	0x0007	Max Attribute Number of Class
7	Max Instance attribute	Get	UINT	0x0012	Last Maximum Attribute Number of Class

4.5.2. Instance 1 Explicit Message

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	State	Get	USINT	0x03	0x00: Non-existent 0x03: Established 0x05: Deferred delete
2	Instance Type	Get	USINT	0x00	
3	Transport class trigger	Get	BYTE	0x83	
4	Produced connection ID	Get	UINT	****	Response message of Slave Explicit
5	Consumed connection ID	Get	UINT	****	Response message of Master Explicit
6	Initial comm. characteristics	Get	BYTE	0x21	
7	Production connection size	Get	UINT	0x002B	
8	Consumption connection size	Get	UINT	0x002E	
9	Expected packet Rate	Get/Set	UINT	0x09C4 (2500)	Range : 0 to 65535 Unit : msec
12	Watchdog time out action	Get	UINT	0x01	
13	Produced connection path length	Get	UINT	0x0000	
14	Produced connection path	Get	Array of USINT	NULL	
15	Consumed connection path length	Get	UINT	0x0000	
16	Consumed connection path	Get	Array of USINT	NULL	
18	Connection timeout multiplier	Get/Set	USINT	0x00	Range : 0 to 7

4.5.3. Instance2 Polled I/O

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	State	Get	USINT	0x01	0x00: Non-existent 0x01: Configuring 0x03: Established 0x04: Time out
2	Instance Type	Get	USINT	0x01	0x01: I/O
3	Transport class trigger	Get	BYTE	0x83	
4	Produced connection ID	Get	UINT	****	I/O Poll Message of Slave
5	Consumed connection ID	Get	UINT	****	I/O Poll Message of Master
6	Initial comm. characteristics	Get	BYTE	0x01	
7	Production connection size	Get	UINT	0x0003	
8	Consumption connection size	Get	UINT	0x0002	
9	Expected packet rate	Get/Set	UINT	0x0000	Range : 0 to 65535 Unit : msec
12	Watchdog time out action	Get	USINT	0x00	Timed out
13	Produced connection path length	Get	UINT	0x0006	
14	Produced connection path	Get/Set	Array of USINT	0x20,0x04,0x24 0x02,0x30,0x03	
15	Consumed connection path length	Get	UINT	0x0006	
16	Consumed connection path	Get/Set	Array of USINT	0x20,0x04,0x24 0x07,0x30,0x03	
18	Connection timeout multiplier	Get/Set	USINT	0x00	Range : 0 to 7

Supported Services

Service Name	Class	Instance	Service code	Note
Get_Attribute_Single	Yes	Yes	0x0E	Read
Set_Attribute_Single	No	Yes	0x10	Write

4.6. S-Device Supervisor object Class (Class Code : 0x30)

4.6.1. Class Attribute

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Revision	Get	UINT	0x0002	Revision Number of Identity Object
2	Max Instance	Get	UINT	0x0001	Max Instance Number of Class
6	Max Class Attribute	Get	UINT	0x0007	Max Attribute Number of Class
7	Max Instance attribute	Get	UINT	0x0010	Last Maximum Attribute Number of Class

4.6.2. Instance1

Attribute		Access Rule	Data Type	Default Value	Note
ID	Name				
3	Manufacture's Device Type	Get	STRING	'MFC'	Mass Flow Controller
4	SEMI standard revision	Get	STRING	'E54-0997'	
5	Manufacture's Name	Get	STRING	'Lintec Co., Ltd.'	
6	Manufacture's model number	Get	STRING	'MC-5000L' / 'LC-5000L'	
7	Software revision level	Get	STRING	'1.00'	
8	Hardware revision level	Get	STRING	'1.00'	
9	Manufacture's serial number	Get	STRING	*****	
11	Device status	Get	USINT	0x00	0x00 : Undefined 0x01 : Self-Testing 0x02 : Idle 0x03 : Self-test exception 0x04 : Executing 0x05 : Abort 0x06 : Critical Fault
12	Exception status	Get	BYTE	0x80	bit0 : Alarm/device common bit1 : Alarm/device specific bit2 : Alarm/manufacturerspecific bit3 : Reserved (Always 0) bit4 : Warning/device common bit5 : Warning/device specific bit6 : Warning/manufacturer specific bit7 : 1 (= Expanded Method)
13	Exception Detail Alarm	Get	STRUCT of		
	#1.Common Exception Detail Size		USINT	0x02	Bytes of Common Exception Detail
	#2.Common Exception Detail 0		BYTE	Refer to 4.6.3.1	
	#3.Common Exception Detail 1		BYTE	Refer to 4.6.3.2	
	#4.Device Exception Detail Size		USINT	0x01	Bytes of Device Exception Detail
	#5.Device Exception Detail 0		BYTE	Refer to 4.6.3.3	
	#6.Manufacturer Exception Detail Size		USINT	0x01	Bytes of Manufacturer Exception Detail
#7.Manufacturer Exception Detail 0	BYTE	Refer to 4.6.3.4	Sensor Zero Alarm Alarm when the sensor value is 200mV or more.		
14	Exception Detail Warning	Get	STRUCT of		
	#1.Common Exception Detail Size		USINT	0x02	
	#2.Common Exception Detail 0		BYTE	Refer to 4.6.3.1	
	#3.Common Exception Detail 1		BYTE	Refer to 4.6.3.2	
	#4.Device Exception Detail Size		USINT	0x01	
	#5.Device Exception Detail 0		BYTE	Refer to 4.6.3.3	
	#6.Manufacturer Exception Detail Size		USINT	0x01	
#7.Manufacturer Exception Detail 0	BYTE	Refer to 4.6.3.4	Sensor Zero Warning Warning when the sensor value is 100mV or more.		
15	Alarm Enable	Get/Set	BOOL	TRUE	FALSE (Disable) /TRUE (Enable)
16	Warning Enable	Get/Set	BOOL	TRUE	FALSE (Disable) /TRUE (Enable)

Supported Services

Service Name	Class	Instance	Service code	Note
Get_Attribute_Single	Yes	Yes	0x0E	Read
Set_Attribute_Single	No	Yes	0x10	Write
Reset	No	Yes	0x05	Device State = "Reset" After reset, Device State became "Idle"
Start	No	Yes	0x06	Device State = "Executing"
Stop	No	Yes	0x07	Device State = "Idle"
Abort	No	Yes	0x4B	Device State = "Abort"
Recover	No	Yes	0x4C	Recover from "Abort"
Perform Diagnostics	No	Yes	0x4E	Device State = "Diagnostics" After reset, Device State became "Idle" (No supported Diagnostics)

4.6.3. Exception Detail Alarm and Exception Detail Warning

4.6.3.1. Common Exception Detail [0]

bit	Name	Alarm	Warning
0	Internal diagnostic exception	0(Normal) or 1(Alarm)	0(Normal) or 1(Warning)
1	Microprocessor exception	0(Normal) or 1(Alarm)	0(Normal) or 1(Warning)
2	EEPROM exception	0(Normal) or 1(Alarm)	0(Normal) or 1(Warning)
3	EEPROM exception	0(Normal) or 1(Alarm)	0(Normal) or 1(Warning)
4	RAM exception	0(Normal) or 1(Alarm)	0(Normal) or 1(Warning)
5	Reserved	Always 0	Always 0
6	Internal real-time exception	0(Normal) or 1(Alarm)	0(Normal) or 1(Warning)
7	Reserved	Always 0	Always 0

4.6.3.2. Common Exception Detail [1]

bit	Name	Alarm	Warning
0 to 7	Reserved	Always 0	Always 0

4.6.3.3. Device Exception Detail

bit	Name	Alarm	Warning
0	Reading Valid	Always 0	0 : Valid Refer to S-Analog Sensor Attribute5. (1 : Valid 0 : Warning up)
1	Flow Low (S-Analog Sensor)	0 or 1	0 (Normal) / 1 (Warning)
2	Flow High (S-Analog Sensor)	0 or 1	0 (Normal) / 1 (Warning)
3	Flow Control (S-Single stage Controller)	0 or 1	0 (Normal) / 1 (Warning)
4	Valve Low (S-Analog Actuator)	0 or 1	0 (Normal) / 1 (Warning)
5	Valve High (S-Analog Actuator)	0 or 1	0 (Normal) / 1 (Warning)
6	Reserved	Always 0	Always 0
7	Reserved	Always 0	Always 0

4.6.3.4. Manufacturer Exception Detail

bit	Name	Alarm	Warning
0	Sensor Zero	Sensor Zero Value is xxxmV or more. (xxx = e.g. 200mV) 0 (Normal) / 1 (Error)	Sensor Zero Value is xxxmV or more. (xxx = e.g. 100mV) 0 (Normal) / 1 (Warning)
1 to 7	Reserved	Always 0	Always 0

4.7. S-Analog Sensor Object Class (Class Code : 0x31)

4.7.1. Class Attribute

Attribute ID	Name	Access rule	Data Type	Default Value	Note
1	Revision	Get	UINT	0x0001	Revision Number of Identity Object
2	Max Instance	Get	UINT	0x0001	Max Instance Number of Class
6	Max Class Attribute	Get	UINT	0x0007	Max Attribute Number of Class
7	Max Instance attribute	Get	UINT	0x0063	Last Maximum Attribute Number of Class

4.7.2. Instance1

Attribute ID	Name	Access rule	Data Type	Default Value	Note
3	Data Type	Get/Set	USINT	0xC3 (= INT) 0xCA (= REAL)	
4	Data Units	Get/Set	UINT	0x1001 (Counts)	0x1001 (= Counts) 0x1007 (= Percent) 0x1400 (= SCCM) (Note1) 0x1401 (= SLM) (Note1) 0x140E (= mg/min) (Note2) 0x140F (= g/min) (Note2) (Note1) For MC-5000L (Note2) For LC-5000L ※ Except for Counts and Percent, use the same setting Full Scale Unit (S-Gas Calibration Object)
5	Reading Valid	Get	BOOL	FALSE (Warning)	FALSE(Warning), TRUE(Available) When turning on the device, it would be FALSE for 30 minutes. After 30 minutes, it would be TRUE. This value is reflected in Exception status and Exception detail warning of S-Device Supervisor.
6	Value	Get	INT/REAL	0x0000	Readable even while 'Idle' State
7	Status	Get	BYTE	0x00	Alarm / Warning
8	Alarm Enable	Get/Set	BOOL	FALSE	FALSE (Disable) /TRUE(Enable)
9	Warning Enable	Get/Set	BOOL	FALSE	FALSE (Disable) /TRUE(Enable)
10	Full Scale	Get/(Set)	INT/REAL	0x6000 (Note3)	0x6000 = 100% (Note3) The settings can be changed at the time of shipment from the factory according to the customer's specifications.
17	Alarm Trip Point High	Get/Set	INT/REAL	0x7FFF (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
18	Alarm Trip Point Low	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
19	Alarm Hysteresis	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
20	Alarm Settling Time	Get/Set	UINT	0x0000	Range : 0 to 65535 m sec Unit : msec
21	Warning Trip Point High	Get/Set	INT/REAL	0x7FFF (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
22	Warning Trip Point Low	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
23	Warning Hysteresis	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
24	Warning Settling Time	Get/Set	UINT	0x0000	Range : 0 to 65535 Unit : msec
27	Auto Zero Enable	Get/Set	BOOL	TRUE	FALSE (Not Detect Zero Error) / TRUE (Detect Zero Error)
28	Auto Zero Status	Get	BOOL	FALSE	FALSE(Stop Zero Adjustment) / TRUE (Start Zero Adjust)
35	Gas Calibration Object Instance	Get/Set	UINT	0x0001	Only Write Value : 0x0001
95	Flow Totalizer	Get/Set	ULINT	0x00000000	Integrated Value (SCCM)
99	Subclass	Get	UINT	0x0001	

Supported Services

Service Name	Class	Instance	Service code	Note
Get_Attribute_Single	Yes	Yes	0x0E	Read
Set_Attribute_Single	No	Yes	0x10	Write
Zero_Adjust	No	Yes	0x4B	Start Zero Adjustment

4.8. S-Analog Actuator Object Class (Class Code : 0x32)

4.8.1. Class Attribute

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Revision	Get	UINT	0x0001	Revision Number of Identity Object
2	Max Instance	Get	UINT	0x0001	Max Instance Number of Class
6	Max Class Attribute	Get	UINT	0x0007	Max Attribute Number of Class
7	Max Instance attribute	Get	UINT	0x0014	Last Maximum Attribute Number of Class

4.8.2. Instance1

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data Type	Get/Set	USINT	0xC3	0xC3 (= INT) 0xCA (= REAL)
4	Data Units	Get/Set	UINT	0x1001	0x1001 (= Counts) 0x1007 (= Percent) 0x2D00 (= Voltage)
5	Override	Get/Set	USINT	0x00	0x00 (= Normal) 0x01 (= Close) 0x02 (= Open) 0x03 (= Hold)
6	Value	Get	INT/REAL	0x0000 (Counts)	
7	Status	Get	BYTE	0x00	1 : High Alarm 2 : Low Alarm 4 : High Warning 8 : Low Warning
8	Alarm Enable	Get/Set	BOOL	FALSE	FALSE (disable) / TRUE (Enable)
9	Warning Enable	Get/Set	BOOL	FALSE	FALSE (disable) / TRUE (Enable)
15	Alarm Trip Point High	Get/Set	INT/REAL	0x7FFF (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
16	Alarm Trip Point Low	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
17	Alarm Hysteresis	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
18	Warning Trip Point High	Get/Set	INT/REAL	0x7FFF (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
19	Warning Trip Point Low	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range : 0x0000 to 0x7FFF
20	Warning Hysteresis	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range:0x0000 to 0x7FFF

Supported Services

Service Name	Class	Instance	Service code	Note
Get_Attribute_Single	Yes	Yes	0x0E	Read
Set_Attribute_Single	No	Yes	0x10	Write

4.9. S-Single Stage Controller Object Class (Class Code : 0x33)

4.9.1. Class Attribute

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Revision	Get	UINT	0x0001	Revision Number of Identity Object
2	Max Instance	Get	UINT	0x0001	Max Instance Number of Class
6	Max Class Attribute	Get	UINT	0x0007	Max Attribute Number of Class
7	Max Instance attribute	Get	UINT	0x0013	Last Maximum Attribute Number of Class

4.9.2. Instance1

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Data Type	Get/Set	USINT	0xC3 (= INT) 0xCA (= REAL)	
4	Data Units	Get/Set	UINT	0x1001 (= Counts)	0x1001 (= Counts) Same setting as Analog Sensor. 0x1007 (=percent) 0x1400 (= SCCM) (Note4) 0x1401 (= SLM) (Note4) 0x140E (= mg/min) (Note5) 0x140F (= g/min) (Note5) (Note4) For MC-5000L (Note5) For LC-5000L ※ Except for Cunts and Percent, use the same setting Full Scale Unit (S-Gas Calibration Object)
6	Set Point	Get/Set	INT/REAL	0x0000 (Counts)	Range : 0x0000 to 0x6000 (e.g. Counts) Per Full Scale Counts
10	Status	Get	BYTE	0x00	Alarm / Warning
11	Alarm Enable	Get/Set	BOOL	FALSE	FALSE (Disable) / TRUE(Enable)
12	Warning Enable	Get/Set	BOOL	FALSE	FALSE (Disable) / TRUE(Enable)
13	Alarm Settling Time	Get/Set	UINT	0x0000	Range : 0 to 65535 Unit : msec
14	Alarm Error Band	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range: 0x0000 to 0x7FFF
15	Warning Settling Time	Get/Set	UINT	0x0000	Range : 0 to 65535 Unit : msec
16	Warning Error Band	Get/Set	INT/REAL	0x0000 (Counts)	Per Data Unit [ID4] (e.g. Counts) Range :0x0000 to 0x7FFF
17	Safe State	Get/Set	USINT	0x00	0x00(= Zero) 0x01(= Full Scale 100%) 0x02(= Hold Last Value) 0x03(= Use Safe Value)
18	Safe Value	Get/Set	INT/REAL	0x0000 (Counts)	
19	Ramp Rate	Get/Set	UDINT	0x00000000	msec

Supported Services

Service Name	Class	Instance	Service code	Note
Get_Attribute_Single	Yes	Yes	0x0E	Read
Set_Attribute_Single	No	Yes	0x10	Write

4.10. S-Gas Calibration object Class (Class Code : 0x34)

4.10.1. Class Attribute

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
1	Revision	Get	UINT	0x0001	Revision Number of Identity Object
2	Max Instance	Get	UINT	0x0001	Max Instance Number of Class
6	Max Class Attribute	Get	UINT	0x0007	Max Attribute Number of Class
7	Max Instance attribute	Get	UINT	0x0063	Last Maximum Attribute Number of Class

4.10.2. Instance1

Attribute		Access rule	Data Type	Default Value	Note
ID	Name				
3	Gas Standard Number	Get	UINT	*****	Gas Number SEMI STD Number
4	Valid Sensor Instance	Get	UINT	0x0001	
5	Gas Symbol	Get/Set	STRING	*****	Gas Name(Max 30 Byte)
6	Full Scale	Get	STRUCT of		Flow Full Scale
			REAL	*****	0x1400 (= SCCM) (Note6) 0x1401 (= SLM) (Note6) 0x140E (= mg/min) (Note7) 0x140F (= g/min) (Note7)
			UINT	0x1400 (= SCCM)	(Note 6) For MC-5000L (Note 7) For LC-5000L
7	Additional Scaler	Get/Set	REAL	1.000	Calibration Gain
8	Calibration Date	Get	UINT	*****	Calibration (Day from1970/01/01)
9	Calibration Gas Number	Get	UINT	*****	Calibration Gas SEMI STD Number
95	Calibration Pressure	Get	REAL	101.3	Calibration Pressure (kPa)
96	Calibration Temperature	Get	REAL	0	Calibration Temperature (°C)
99	Subclass	Get	UINT	0x0001	

Supported Services

Service Name	Class	Instance	Service code	Note
Get_Attribute_Single	Yes	Yes	0x0E	Read
Set_Attribute_Single	No	Yes	0x10	Write
Get_All_Instances	Yes	No	0x4B	Read All Instances

Output When Get_All_Instances is executed

	Data Type	Note	Value
Size of List	UINT	Max Instance of Class	0x0001
List of Gas Calibration	STRUCT of		
	UINT	S-Gas Calibration object instance ID	0x0001
	UINT	Gas Standard Number	Instance1, Attribute3
	UINT	Valid sensor Instance	Instance1, Attribute4

*MC-5000L and LC-5000L are Single Gas Setting.

5. EDS File

Please contact our sales department for the EDS File.



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