

VD 2 VFL.0 /-V-I4M020

Vendor ID	348 / 0x015C
Vendor Name	HYDAC FILTERTECHNIK GMBH
Vendor Text	Justus-von-Liebig-Str., D-66280 Sulzbach/Saar
Vendor URL	http://www.hydac.com
Device ID	9279020 / 0x8D962C


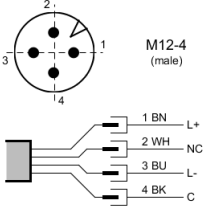
Communication

IO - Link Revision	V1.1
Bitrate	COM2
Minimum Cycle Time	10 ms
SIO Mode supported	no

Features

Block Parameter	yes
Data Storage	yes
Profiles	16384 / 0x4000 (Common Application Profile: Identification & Diagnosis)
Access Locks	Parameter: no Data Storage: yes Local Parameterization: no Local User Interface: no

Device Variant

		927902
		VD 2 VFL.0 /-V-I4M020
		Virtual Fluid Lab (VFL) for remaining life time calculation with IO-Link interface.

Process Data

Process Data In						
Name	Description	Subindex	Offset	Data Type	Length	Allowed Values
VFL		0		RecordT	96 Bit	
Remaining Life Time	Remaining life time in h with 1 decimal place.	1	64 Bit	UIntegerT	32 Bit	
Operating Hours	Operating hours in h with 1 decimal place.	2	32 Bit	UIntegerT	32 Bit	
Error	Calculation inactive or disabled. See device status for details.	3	5 Bit	BooleanT	1 Bit	
Temperature Not Available	Temperature not available. Calculation uses reference temperature (40 °C).	4	4 Bit	BooleanT	1 Bit	
Filter Full	Filter full.	5	3 Bit	BooleanT	1 Bit	
Temperature Out Of Range	Temperature below temperature threshold or above maximum temperature (120 °C). No calculation done.	6	2 Bit	BooleanT	1 Bit	
Pressure Low	Pressure below pressure threshold. No calculation done.	7	1 Bit	BooleanT	1 Bit	
Initialization	Calculation in initialization phase.	8	0 Bit	BooleanT	1 Bit	
Process Data Out						
Name	Description	Subindex	Offset	Data Type	Length	Allowed Values
Temperature		0		IntegerT	16 Bit	

Variables

Name	Description	Index	Subindex	Offset	Data Type	Length	Access Rights	Default	Allowed Values
Direct Parameters - Page 1	Comprises the required parameters defining the communication characteristics and identifiers for device validation.	0x00 (0)	0		RecordT	128 Bit	rw		
Reserved			1	120 Bit	UIntegerT	8 Bit	ro		
Master Cycle Time	Communication: Current communication cycle duration used by the master. This value defines the process data cycle.		2	112 Bit	UIntegerT	8 Bit	ro		
Min Cycle Time	Communication: Minimum communication cycle duration supported by the device. This value defines the lowest possible process data cycle.		3	104 Bit	UIntegerT	8 Bit	ro		
M-Sequence Capability	Communication: Information on the structure and the supported features of the communication messages.		4	96 Bit	UIntegerT	8 Bit	ro		
IO-Link Revision ID	Communication: Identifier for the currently used communication protocol revision.		5	88 Bit	UIntegerT	8 Bit	ro	17	
Process Data Input Length	Communication: Information on width and features of the process input data (Process Data from Device to Master).		6	80 Bit	UIntegerT	8 Bit	ro		
Process Data Output Length	Communication: Information on width of the process output data (Process Data from Master to Device).		7	72 Bit	UIntegerT	8 Bit	ro		
Vendor ID 1	Identification: Highest octet of the Vendor ID. Combined with the parameter Vendor ID 2, this parameter defines the 16-bit value of the unique Vendor ID as assigned by the IO-Link Community.		8	64 Bit	UIntegerT	8 Bit	ro		
Vendor ID 2	Identification: Lowest octet of the Vendor ID. Combined with the parameter Vendor ID 1, this parameter defines the 16-bit value of the unique Vendor ID as assigned by the IO-Link Community.		9	56 Bit	UIntegerT	8 Bit	ro		
Device ID 1	Identification: Highest octet of the Device ID. Combined with the parameters Device ID 2 and 3, this parameter defines the 24-bit value of the vendor-specific Device ID.		10	48 Bit	UIntegerT	8 Bit	ro		
Device ID 2	Identification: Middle octet of the Device ID. Combined with the parameters Device ID 1 and 3, this parameter defines the 24-bit value of the vendor-specific Device ID.		11	40 Bit	UIntegerT	8 Bit	ro		
Device ID 3	Identification: Lowest octet of the Device ID. Combined with the parameters Device ID 1 and 2, this parameter defines the 24-bit value of the vendor-specific Device ID.		12	32 Bit	UIntegerT	8 Bit	ro		
Reserved			13	24 Bit	UIntegerT	8 Bit	ro		
Reserved			14	16 Bit	UIntegerT	8 Bit	ro		
Reserved			15	8 Bit	UIntegerT	8 Bit	ro		
System Command	Application: Command interface for devices without ISDU support. Validity and execution of commands are not confirmed.		16	0 Bit	UIntegerT	8 Bit	wo		
Direct Parameters - Page 2	A set of parameters for devices without ISDU support.	0x01 (1)	0		RecordT	128 Bit	rw		
Device-specific Parameter 1			1	120 Bit	UIntegerT	8 Bit			
Device-specific Parameter 2			2	112 Bit	UIntegerT	8 Bit			
Device-specific Parameter 3			3	104 Bit	UIntegerT	8 Bit			
Device-specific Parameter 4			4	96 Bit	UIntegerT	8 Bit			
Device-specific Parameter 5			5	88 Bit	UIntegerT	8 Bit			
Device-specific Parameter 6			6	80 Bit	UIntegerT	8 Bit			
Device-specific Parameter 7			7	72 Bit	UIntegerT	8 Bit			
Device-specific Parameter 8			8	64 Bit	UIntegerT	8 Bit			
Device-specific Parameter 9			9	56 Bit	UIntegerT	8 Bit			
Device-specific Parameter 10			10	48 Bit	UIntegerT	8 Bit			

Variables

Name	Description	Index	Subindex	Offset	Data Type	Length	Access Rights	Default	Allowed Values
Device-specific Parameter 11			11	40 Bit	UIntegerT	8 Bit			
Device-specific Parameter 12			12	32 Bit	UIntegerT	8 Bit			
Device-specific Parameter 13			13	24 Bit	UIntegerT	8 Bit			
Device-specific Parameter 14			14	16 Bit	UIntegerT	8 Bit			
Device-specific Parameter 15			15	8 Bit	UIntegerT	8 Bit			
Device-specific Parameter 16			16	0 Bit	UIntegerT	8 Bit			
System Command	Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.	0x02 (2)	0		UIntegerT	8 Bit	wo		(128) Device Reset (130) Restore Factory Settings (164) Reset Min/Max Process Values (170) Reset VFL Calculation (240) Set Test Event 1 (241) Reset Test Event 1 (242) Set Test Event 2 (243) Reset Test Event 2
Device Access Locks	The access to the device parameters can be restricted by setting appropriate flags within this parameter.	0x0C (12)	0		RecordT	16 Bit	rw		
Parameter Write Access	This lock prevents the write access to all read/write parameters of the device except for the parameter 'Device Access Locks'.		1	0 Bit	BooleanT	1 Bit			(True) Locked (False) Unlocked
Data Storage	This lock prevents the write access to the device parameters via the data storage mechanism.		2	1 Bit	BooleanT	1 Bit			(True) Locked (False) Unlocked
Local Parameterization	This lock prevents the device settings from being changed via local operating elements on the device.		3	2 Bit	BooleanT	1 Bit			(True) Locked (False) Unlocked
Local User Interface	This lock prevents the access to the device settings and display via a local user interface. The user interface is disabled.		4	3 Bit	BooleanT	1 Bit			(True) Locked (False) Unlocked
Vendor Name	The vendor name that is assigned to a Vendor ID.	0x10 (16)	0		StringT	max 64 Byte	ro	HYDAC FILTERTECHNIK GMBH	
Product Name	Complete product name.	0x12 (18)	0		StringT	max 64 Byte	ro	VD 2 VFL.0 /-V- I4M020	
Product ID	Vendor-specific product or type identification (e.g., item number or model number).	0x13 (19)	0		StringT	max 64 Byte	ro	927902	
Serial Number	Unique, vendor-specific identifier of the individual device.	0x15 (21)	0		StringT	max 16 Byte	ro		
Hardware Revision	Unique, vendor-specific identifier of the hardware revision of the individual device.	0x16 (22)	0		StringT	max 64 Byte	ro		
Firmware Revision	Unique, vendor-specific identifier of the firmware revision of the individual device.	0x17 (23)	0		StringT	max 64 Byte	ro		
Application-specific Tag	Possibility to mark a device with user- or application-specific information.	0x18 (24)	0		StringT	max 32 Byte	rw	***	
Error Count	Number of errors that occurred in the technology-specific application since power on or restart.	0x20 (32)	0		UIntegerT	16 Bit	ro		

Variables

Name	Description	Index	Subindex	Offset	Data Type	Length	Access Rights	Default	Allowed Values
Device Status	Indicator for the current device condition and diagnosis state.	0x24 (36)	0		UIntegerT	8 Bit	ro		(0) Device is OK (1) Maintenance required (2) Out of specification (3) Functional check (4) Failure [5..255] Reserved
Detailed Device Status	List of all currently pending events in the device.	0x25 (37)	0		ArrayT[8]	24 Byte	ro		
Detailed Device Status [0]			1	168 Bit	OctetStringT	3 Byte	ro		
Detailed Device Status [1]			2	144 Bit	OctetStringT	3 Byte	ro		
Detailed Device Status [2]			3	120 Bit	OctetStringT	3 Byte	ro		
Detailed Device Status [3]			4	96 Bit	OctetStringT	3 Byte	ro		
Detailed Device Status [4]			5	72 Bit	OctetStringT	3 Byte	ro		
Detailed Device Status [5]			6	48 Bit	OctetStringT	3 Byte	ro		
Detailed Device Status [6]			7	24 Bit	OctetStringT	3 Byte	ro		
Detailed Device Status [7]			8	0 Bit	OctetStringT	3 Byte	ro		
Process Data Input	Last valid process input data of the device.	0x28 (40)	0				ro		
Process Data Output	Last valid process output data written to the device.	0x29 (41)	0				ro		
Function Tag		0x19 (25)	0		StringT	max 32 Byte	rw	***	
Location Tag		0x1A (26)	0		StringT	max 32 Byte	rw	***	
Parameter 1	Pressure threshold in bar with 2 decimal places.	0x40 (64)	0		IntegerT	16 Bit	rw	20	[5..100]
Parameter 2	Temperature threshold in °C.	0x41 (65)	0		IntegerT	16 Bit	rw	35	[0..40]
Parameter 3	Filtration end pressure in bar with 1 decimal place.	0x42 (66)	0		IntegerT	16 Bit	rw	20	[10..100]
Parameter 4	Viscosity at 40 °C in cSt with 2 decimal places.	0x43 (67)	0		IntegerT	32 Bit	rw	4500	[10..100000]
Parameter 5	Viscosity at 100 °C in cSt with 2 decimal places.	0x44 (68)	0		IntegerT	32 Bit	rw	670	[10..100000]
Parameter 6	Service parameter with 2 decimal places. Do not use.	0x45 (69)	0		IntegerT	16 Bit	ro	-33	[-500..-20]
Parameter 7	Service parameter with 2 decimal places. Do not use.	0x46 (70)	0		IntegerT	16 Bit	ro	-300	[-500..-20]
Parameter 8	Service parameter with 1 decimal place. Do not use.	0x47 (71)	0		UIntegerT	32 Bit	ro	99990	[10000..1000000]
Parameter 9	Service parameter. Do not use.	0x48 (72)	0		UIntegerT	32 Bit	ro	6000	[1000..10000]
Parameter 10	Service parameter with 1 decimal place. Do not use.	0x49 (73)	0		UIntegerT	32 Bit	ro	500	[10..10000]
Parameter 11	Service parameter. Do not use.	0x4A (74)	0		UIntegerT	32 Bit	ro	3	[1..2000]
Parameter 12	Service parameter. Do not use.	0x4B (75)	0		UIntegerT	16 Bit	ro	30	[0..80]
Parameter 13	Service parameter. Do not use.	0x4C (76)	0		UIntegerT	16 Bit	ro	80	[50..99]
Parameter 14	Service parameter. Do not use.	0x4D (77)	0		IntegerT	16 Bit	ro	500	[10..500]
Parameter 15	Service parameter. Do not use.	0x4E (78)	0		BooleanT	1 Bit	ro	true	
Parameter 16	Service parameter with 2 decimal places. Do not use.	0x4F (79)	0		ArrayT[14]	224 Bit	ro		
Parameter 16 [0]			1	208 Bit	IntegerT	16 Bit	ro		
Parameter 16 [1]			2	192 Bit	IntegerT	16 Bit	ro		
Parameter 16 [2]			3	176 Bit	IntegerT	16 Bit	ro		
Parameter 16 [3]			4	160 Bit	IntegerT	16 Bit	ro		
Parameter 16 [4]			5	144 Bit	IntegerT	16 Bit	ro		
Parameter 16 [5]			6	128 Bit	IntegerT	16 Bit	ro		
Parameter 16 [6]			7	112 Bit	IntegerT	16 Bit	ro		
Parameter 16 [7]			8	96 Bit	IntegerT	16 Bit	ro		
Parameter 16 [8]			9	80 Bit	IntegerT	16 Bit	ro		
Parameter 16 [9]			10	64 Bit	IntegerT	16 Bit	ro		

Variables

Name	Description	Index	Subindex	Offset	Data Type	Length	Access Rights	Default	Allowed Values
Parameter 16 [10]			11	48 Bit	IntegerT	16 Bit	ro		
Parameter 16 [11]			12	32 Bit	IntegerT	16 Bit	ro		
Parameter 16 [12]			13	16 Bit	IntegerT	16 Bit	ro		
Parameter 16 [13]			14	0 Bit	IntegerT	16 Bit	ro		
Parameter 17	Service parameter with 2 decimal places. Do not use.	0x50 (80)	0		ArrayT[14]	224 Bit	ro		
Parameter 17 [0]			1	208 Bit	IntegerT	16 Bit	ro		
Parameter 17 [1]			2	192 Bit	IntegerT	16 Bit	ro		
Parameter 17 [2]			3	176 Bit	IntegerT	16 Bit	ro		
Parameter 17 [3]			4	160 Bit	IntegerT	16 Bit	ro		
Parameter 17 [4]			5	144 Bit	IntegerT	16 Bit	ro		
Parameter 17 [5]			6	128 Bit	IntegerT	16 Bit	ro		
Parameter 17 [6]			7	112 Bit	IntegerT	16 Bit	ro		
Parameter 17 [7]			8	96 Bit	IntegerT	16 Bit	ro		
Parameter 17 [8]			9	80 Bit	IntegerT	16 Bit	ro		
Parameter 17 [9]			10	64 Bit	IntegerT	16 Bit	ro		
Parameter 17 [10]			11	48 Bit	IntegerT	16 Bit	ro		
Parameter 17 [11]			12	32 Bit	IntegerT	16 Bit	ro		
Parameter 17 [12]			13	16 Bit	IntegerT	16 Bit	ro		
Parameter 17 [13]			14	0 Bit	IntegerT	16 Bit	ro		
Remaining Life Time	Remaining life time in h with 1 decimal place.	0x60 (96)	0		UIntegerT	32 Bit	ro		
Operating Hours	Operating hours in h with 1 decimal place.	0x61 (97)	0		UIntegerT	32 Bit	ro		
Status	Status of remaining life time calculation.	0x64 (100)	0		RecordT	8 Bit	ro		
Initialization	Calculation in initialization phase.		1	0 Bit	BooleanT	1 Bit			
Pressure Low	Pressure below pressure threshold. No calculation done.		2	1 Bit	BooleanT	1 Bit			
Temperature Out Of Range	Temperature below temperature threshold or above maximum temperature (120 °C). No calculation done.		3	2 Bit	BooleanT	1 Bit			
Filter Full	Filter full.		4	3 Bit	BooleanT	1 Bit			
Temperature Not Available	Temperature not available. Calculation uses reference temperature (40 °C).		5	4 Bit	BooleanT	1 Bit			
Error	Calculation inactive or disabled. See device status for details.		6	5 Bit	BooleanT	1 Bit			
Device Temperature	Device temperature process values since manual reset. Manual reset can be done with Standard Command 164.	0x7F (127)	0		RecordT	48 Bit	ro		
Current Value	Current device temperature value in °C with 1 decimal place.		1	32 Bit	IntegerT	16 Bit			
Min Value	Minimum device temperature value in °C with 1 decimal place.		2	16 Bit	IntegerT	16 Bit			
Max Value	Maximum device temperature value in °C with 1 decimal place.		3	0 Bit	IntegerT	16 Bit			
Pressure Filter Constant	Filter time constant for pressure process values in ms. Time constants below the sample rate of 1 ms have no effect.	0x84 (132)	0		UIntegerT	16 Bit	rw	0	[0..1000]

Events

Code	Type	Name	Description
0x4210 (16912)	Warning	Device temperature overrun	Clear source of heat
0x4220 (16928)	Warning	Device temperature underrun	Insulate device
0x5000 (20480)	Error	Device hardware fault	Exchange device
0x6320 (25376)	Error	Parameter error	Check datasheet and values
0x8C00 (35840)	Error	Technology-specific application fault	Reset device
0x8C20 (35872)	Error	Measurement range exceeded	Check application
0x8DFE (36350)	Error	Test Event 1	Test event 1 for conformance test. Event appears after writing Standard Command 240. Event disappears after writing Standard Command 241.
0x8DFF (36351)	Error	Test Event 2	Test event 2 for conformance test. Event appears after writing Standard Command 242. Event disappears after writing Standard Command 243.

Error Types

Error Code	Additional Code	Name	Description
0x80 (128)	0x11 (17)	Index not available	Read or write access attempt to a non-existing index.
0x80 (128)	0x12 (18)	Subindex not available	Read or write access attempt to a non-existing subindex of an existing index.
0x80 (128)	0x20 (32)	Service temporarily not available	Parameter not accessible due to the current state of the technology-specific application.
0x80 (128)	0x22 (34)	Service temporarily unavailable - device control	Parameter not accessible. The technology-specific application is currently in a remotely triggered operation.
0x80 (128)	0x23 (35)	Access denied	Write access to a read-only parameter or read access to write-only parameter.
0x80 (128)	0x30 (48)	Parameter value out of range	Written parameter value is outside of the permitted value range.
0x80 (128)	0x31 (49)	Parameter value above limit	Written parameter value is above its specified value range
0x80 (128)	0x32 (50)	Parameter value below limit	Written parameter value is below its specified value range
0x80 (128)	0x33 (51)	Parameter length overrun	Written parameter is longer than specified.
0x80 (128)	0x34 (52)	Parameter length underrun	Written parameter is shorter than specified.
0x80 (128)	0x35 (53)	Function unavailable	Written command is not supported by the technology-specific application
0x80 (128)	0x36 (54)	Function temporarily unavailable	Written command is unavailable due to the current state of the technology-specific application.
0x80 (128)	0x40 (64)	Invalid parameter set	Written single parameter value collides with other existing parameter settings.
0x80 (128)	0x41 (65)	Inconsistent parameter set	Parameter set inconsistencies at the end of block parameter transfer. Device plausibility check failed.
0x81 (129)	0x10 (16)	Persistent memory error	No details.
0x81 (129)	0x11 (17)	Parameter store failed	Parameter could not be stored in persistent memory.