bürkert
FLUID CONTROL SYSTEMS

Type 8693

Modbus TCP

Objects

Document version 2.00

Supplement to Operating Instructions

Contents

1 History

Document version	Date	Changes
2.00	2022-07-19	Object Route Function is disabled by default Changed wording Config Client → Backup File KPopen and KPclose were interchanged Parameters in display unit zError added Fixed Description of NamurStatus (reserved bits 4-7)
1.03	2019-07-05	Added Description of Object Route Function Changed wording: SIM-Card → Config-Client Fixed cyclic Modbus addresses
1.02	2018-02-01	Add Parameters to start Tunes from fieldbus
1.01	2017-12-21	Initial released version

2 Overview

Used datatypes:

UINT8	8 bit: unsigned integer
UINT16	16 bit: unsigned integer
UINT32	32 bit: unsigned integer
SINT16	16 bit: signed integer
REAL32	32 bit: float value IEEE 754
String	C-string

3 Objects

3.1 Cyclic data

Device and Modbus address ranges

Device address	Modbus address	description	function	access
1… 10000	address - 1	Coils (outputs)	01	read / write
10001 ... 20000	address - 10001	Discrete Inputs	02	read
40001 … 50000	address - 40001	Holding Registers	03	read / write
30001 … 40000	address - 30001	Input Registers	04	read

FC	Modbus Address	Device Address	name	description	access type	Backup File
04	**0**	**30001**	POS	*Current valve position* *REAL32 in %*	RO	
04	**2**	**30003**	NamurStatus	*Represents the device status* [1] *UINT8*	RO	
04	**4**	**30005**	PV_UserUnit	*Current process value* *REAL32 in display unit*	RO	
03	**0**	**40001**	CMD	*Position set point* *REAL32 in %*	RW	
03	**2**	**40003**	PV	*Process value used if PV source is bus* *REAL32 in display unit*	RW	
03	**6**	**40007**	SP_UserUnit	*Process set point* *REAL32 in display unit*	RW	

1)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
reserved				Namur state: 0 – normal 1 – diagnose active 2 – maintenance required 3 – out of specification 4 – warning 5 - error			

3.2 Acyclic data

3.2.1 Device Data (Offset 1000)

3.2.1.1 Object Route Function

The function is disabled by default.
It can be enabled via the device menu.

FC	Modbus Address	Device Address	name	description	access type	Backup File
03	1000 (0x03E8)	41001	Index / Subindex / NodeID	Target object: Writing Index and Subindex of the object.Index and Subindex are stored in the device description/EDS. The NodeID is always 0. Index: 2 bytes (MSB), Subindex: 1 byte, Node ID: 1 byte (always 0). For write access + 0x00000080 UINT32	RW	
03	1002 (0x03EA)	41003	Data length (write access)	Data length of the write command in bytes, number of valid bytes is not specified for reading. UINT32	RW	
03	1004 (0x03EC)	41005	Value UINT32	Here the value to be written is specified or the readout value is displayed. Data ≤ 4 bytes. UINT32	RW	
03	1006 (0x03EE)	41007	Value String	Is used to read and write texts. Data > 4 bytes. STRING	RW	
03	1016 (0x03F8)	41017	result	Process result: 0 = Command successfully executed > 0 = Error occurred during execution (see “Table 6”) 0xFFFFFFFF: Read and write process not yet Concluded UINT32	RO	
03	1018 (0x03FA)	41019	call/cancel	Execute command: 1 = execute 0 = finish UINT8	RW	

3.2.1.2 Control Mode

FC	Modbus Address	Device Address	name	description	access type	Backup File
03	1019 (0x03FB)	41020	Control Mode	*UINT32*	RW	

3.2.1.3 Buerkert Device Description Object

FC	Modbus Address	Device Address	name	description	access type	Backup File
03	1021 (0x03FD)	41022	Device Name	*Unique device name* *Visible string*	RO	
03	1031 (0x0407)	41032	Ident Number	*Device ID No.* *UINT32*	RO	
03	1033 (0x0409)	41034	Manufacture Date	*Visible string*	RO	
03	1043 (0x0413)	41044	Software Ident Number	*Uint32* *ID No. of firmware* *UINT32*	RO	
03	1045 (0x0415)	41046	Software Version	*Version No. of firmware* *UINT32*	RO	
03	1047 (0x0417)	41048	Hardware Version	*Version No. of hardware* *UINT32*	RO	
03	1049 (0x0419)	41050	Serial Number	*Serial No. device* *UINT32*	RO	

3.2.2 Position Controller Parameter (Offset 200)

FC	Modbus Address	Device Address	name	description	access type	Backup File
03	200 (0xC8)	40201	DBDx	*Deadband of the position controller in %* *REAL32*	RW	X
03	202 (0xCA)	40203	KPclose	*Proportional gain for closing the valve* *SINT16*	RW	X
03	203 (0xCB)	40204	KPopen	*Proportional gain for opening the valve* *SINT16*	RW	X
03	204 (0xCC)	40205	mCHARACT	*Charact curve selected* *0: No charact curve* *1:Charact Curve 1:25* *2:Charact Curve 1:33* *3:Charact Curve 1:50* *4:Charact Curve 25:1* *5:Charact Curve 33:1* *6:Charact Curve 50:1* *7:FREE (See CHARACTy for defining the values)* *See User Manual for description of the function.* *SINT16*	RW	X
03	205 (0xCD)	40206	CUTOFFmin	*Lower CUTOFF level in %* *SINT16*	RW	X
03	206 (0xCE)	40207	CUTOFFmax	*Upper CUTOFF level in %* *SINT16*	RW	X
03	208 (0xD0)	40209	POSmin	*Lower position for X.LIMIT in %* *SINT16*	RW	X
03	209 (0xD1)	40210	POSmax	*Upper position for X.LIMIT in %* *SINT16*	RW	X

03	**210 (0xD2)**	**40211**	XTIMEopen	*Limited opening time of the valve in s (X.TIME)* *REAL32*	RW	X
03	**212 (0xD4)**	**40213**	XTIMEclose	*Limited closing time of the valve in s (X.TIME)* *REAL32*	RW	X
03	**214 (0xD6)**	**40215**	mDIRact	*0: direct effective direction (deaerated → 0 %; aerated 100 %)* *1: inverse effective direction (deaerated → 100 %; aerated 0 %)* *See User Manual for description of the function.* *SINT16*	RW	X
03	**215 (0xD7)**	**40216**	mSAFEpos	*Position used as safepos in %* *SINT16*	RW	X
03	**216 (0xD8)**	**40217**	TUNEflags	*0 if last tune was successful* *UINT8*	RO	
03	**217 (0xD9)**	**40218**	Menu_Items	*Bitfield to Activate/Deactivate functions from ADD.FUNCTION menu* *Bit0 – Bit6: unused* *Bit7: CHARACT* *Bit8: CUTOFF* *Bit9: DIR.CMD* *Bit10: DIR.ACT* *Bit11: SPLTRNG* *Bit12: X.LIMIT* *Bit13: X.TIME* *Bit14: X.CONTROL* *Bit15: P.CONTROL (only 8693/8793)* *Bit16: SECURITY* *Bit17: SAFEPOS* *Bit18: SIG.ERROR* *Bit19: BINARY.IN* *Bit20: OUTPUT* *Bit21: CAL.USER* *Bit22: SET.FACTORY* *Bit23: SERVICE.BUES* *Bit24: EXTRAS* *Bit25: POS.SENSOR (only type 879X)* *Bit26: SERVICE* *Bit27: SIMULATION* *Bit28: DIAGNOSE* *Bit29: F.CONTROL (only with FMR option)* *UINT32*	RW	X
03	**219 (0xDB)**	**40220**	startTune	*Start Tune via fieldbus* *2: X.Tune* *9: P.Q.Lin* *10 : P.Tune* *startTune is set back from device* *0:TUNE successfully started* *255:TUNE could not be started* *Tune has finished when zOPmode changed back to Auto or Manual mode. Get result of last tune by reading object TUNEflags* **since Release B.02.01* *UINT8*	RW	
03	**220 (0xDC)**	**40221**	z_OPmode	*Get the current operating mode* *0: Auto* *1: Manual mode* *2: X.Tune* *9: P.Q.Lin*	RO	

				10 : P.Tune **since Release B.02.01* *UINT8*		
03	**222 (0xDE)**	**40223**	CHARACTy1	*freely programmable characteristic node 1* *SINT16*	RW	X
03	**223 (0xDF)**	**40224**	CHARACTy2	*freely programmable characteristic node 2* *SINT16*	RW	X
03	**224 (0xE0)**	**40225**	CHARACTy3	*freely programmable characteristic node 3* *SINT16*	RW	X
03	**225 (0xE1)**	**40226**	CHARACTy4	*freely programmable characteristic node 4* *SINT16*	RW	X
03	**226 (0xE2)**	**40227**	CHARACTy5	*freely programmable characteristic node 5* *SINT16*	RW	X
03	**227 (0xE3)**	**40228**	CHARACTy6	*freely programmable characteristic node 6* *SINT16*	RW	X
03	**228 (0xE4)**	**40229**	CHARACTy7	*freely programmable characteristic node 7* *SINT16*	RW	X
03	**229 (0xE5)**	**40230**	CHARACTy8	*freely programmable characteristic node 8* *SINT16*	RW	X
03	**230 (0xE6)**	**40231**	CHARACTy9	*freely programmable characteristic node 9* *SINT16*	RW	X
03	**231 (0xE7)**	**40232**	CHARACTy10	*freely programmable characteristic node 10* *SINT16*	RW	X
03	**232 (0xE8)**	**40233**	CHARACTy11	*freely programmable characteristic node 11* *SINT16*	RW	X
03	**233 (0xE9)**	**40234**	CHARACTy12	*freely programmable characteristic node 12* *SINT16*	RW	X
03	**234 (0xEA)**	**40235**	CHARACTy13	*freely programmable characteristic node 13* *SINT16*	RW	X
03	**235 (0xEb)**	**40236**	CHARACTy14	*freely programmable characteristic node 14* *SINT16*	RW	X
03	**236 (0xEC)**	**40237**	CHARACTy15	*freely programmable characteristic node 15* *SINT16*	RW	X
03	**237 (0xED)**	**40238**	CHARACTy16	*freely programmable characteristic node 16* *SINT16*	RW	X
03	**238 (0xEE)**	**40239**	CHARACTy17	*freely programmable characteristic node 17* *SINT16*	RW	X
03	**239 (0xEF)**	**40240**	CHARACTy18	*freely programmable characteristic node 18* *SINT16*	RW	X
03	**240 (0xF0)**	**40241**	CHARACTy19	*freely programmable characteristic node 19* *SINT16*	RW	X
03	**241 (0xF1)**	**40242**	CHARACTy20	*freely programmable characteristic node 20* *SINT16*	RW	X
03	**242 (0xF2)**	**40243**	CHARACTy21	*freely programmable characteristic node 21* *SINT16*	RW	X
03	**221 (0xDD)**	**40222**	mDIRcmd	*0: Rise (direct effective direction)* *1: Fall (inverse effective direction)* *See User Manual for description of the function.* *SINT16*	RW	X
03	**243 (0xF3)**	**40244**	zError	*Bit0 – Bit9: internal* *Bit10: cable break PV* *Bit11: cable break CMD* *Bit12: cable break SP* *Bit13: cable break PT100* *Bit 14: cable break P1*	RO	

				Bit15: cable break P2 *Bit16: cable break MTMP* *Bit17 – Bit20: internal* *Bit21: WMS signal error* *Bit22: Puck signal too weak* *Bit23: CMD out of specification* *Bit24: SP out of specification* *Bit25: PV out of specification* *Bit26: MTMP out of specification* *UINT32*		

3.2.3 Process Controller Parameter (Offset 400)

FC	Modbus Address	Device Address	name	description	access type	Backup File
03	400 (0x190)	40401	DBDp	*Deadband of process controller in % (Scaled with PVmin and PVmax)* *REAL32*	RW	X
03	402 (0x192)	40403	KP	*Proportional gain of the process controller* *REAL32*	RW	X
03	404 (0x194)	40405	TN	*Integral action time of the process controller in s* *REAL32*	RW	X
03	406 (0x196)	40407	TV	*Derivative action time of the process controller in s* *REAL32*	RW	X
03	408 (0x198)	40409	X_0	*Operating point of the process controller, position in %* *REAL32*	RW	X
03	410 (0x19A)	40411	mPCONsetp	*0: Input of the set-point value on the process level* *1: Default of the set-point value via fieldbus input* *SINT16*	RW	X
03	411 (0x19B)	40412	mPCONinp	*Selecting the type of analog input for ProcessValue of the process controller* *1:4-20 mA* *2:Frequency* *3:PT100* *4:BueS/Fieldbus* *SINT16*	RW	X
03	412 (0x19C)	40413	FTfgPV	*Predefined filter setting Values for the process value input* *0: Filter 0 (10 Hz)* *1: Filter 1 (5 Hz)* *2: Filter 2 (2 Hz)* *3: Filter 3 (1 Hz)* *4: Filter 4 (0,5 Hz)* *5: Filter 5 (0,2 Hz)* *6: Filter 6 (0,1 Hz)* *7: Filter 7 (0,07 Hz)* *8: Filter 8 (0,05 Hz)* *9: Filter 9 (0,03 Hz)* *SINT16*	RW	X
03	413 (0x19D)	40414	SCALunit	*Unit of process controller* *0: l/s* [1] *1: l/min* [1] *2: l/h* [1] *3: m³/min* [1] *4: m³/h* [1] *5: UG/s* [1] *6: UG/min* [1] *7: UG/h* [1] *8: IG/s* [1] *9: IG/min* [1] *10: IG/h* [1] *11: °C* [2] *12: °F* [2] *13: m/s*	RW	X

[1] mPCONinp = 2 (Frequency) can only use values 0 - 10
[2] mPCONinp = 3 (PT100) can only use values 11 and 12

				14: bar *15: mbar* *16: psi* *17: %* *18: mm* *19: m* *20: Liter* *21 : Nl/s* *22 : Nl/min* *23 : Nl/h* *24: none* *SINT16*		
03	**414 (0x19E)**	**40415**	SCALdp	*Decimal point of process controller scaling (0-3)* *SINT16*	RW	X
03	**415 (0x19F)**	**40416**	PVmin	*Lower scaling point PV (display unit)* *REAL32*	RW	X
03	**417 (0x1A1)**	**40418**	PVmax	*Upper scaling point PV (display unit)* *REAL32*	RW	X
03	**419 (0x1A3)**	**40420**	SPmin	*Lower scaling point SP (display unit)* *REAL32*	RW	X
03	**421 (0x1A5)**	**40422**	SPmax	*Upper scaling point SP (display unit)* *REAL32*	RW	X
03	**423 (0x1A7)**	**40424**	mCUTOFFtype	*0: CUTOFF function is based on SP* *1: CUTOFF function is based on CMD* *See User Manual for description of the function.* *SINT16*	RW	X
03	**424 (0x1A8)**	**40425**	mERRpinp_func	*0: signal break detection of PV inactive* *1: signal break detection of PV active* *SINT16*	RW	X
03	**425 (0x1A9)**	**40426**	mSPOSpinp_func	*0: no safepos when PV signal break detected* *1: safepos when PV signal break detected* *Requires that mERRpinp_func is activated* *SINT16*	RW	X
03	**426 (0x1AA)**	**40427**	mPCONact	*Deactivate process controller via bueS/fieldbus* *0: process controller inactive* *1: process controller active* *UINT8*	RW	X

4 Unit conversion

Display Unit	bueS specific SI Unit	Scaling factor
l/s	l/min	1/60
l/min	l/min	1
l/h	l/min	60
m³/min	l/min	1/1000
m³/h	l/min	60/1000
UG/s	l/min	1/(3.7854 * 60)
UG/min	l/min	1/3.7854
UG/h	l/min	60/3.7854
IG/s	l/min	1/(4.5461 * 60)
IG/min	l/min	1/4.5461
IG/h	l/min	60/4.5461
°C	K	$T_{°C} = T_K - 273.15$ °
°F	K	$T_{°F} = T_K*1.8 -459.67$
m/s	m/s	1
bar	Pa	1/100000
mbar	Pa	1/100
psi	Pa	1.450377e-4
%	%	1
mm	m	1000
m	m	1
l	l	1
Nl/s	Nl/min	1/60
Nl/min	Nl/min	1
Nl/h	Nl/min	60