

## Technical Description

### NIVUS MODBUS TCP/RTU Application Interface for series NivuFlow 5xx, 6xx, 7xx, Energy Saver and NivuParQ 850 Transmitters



Based on: Modbus\_NivuFlow2\_1

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### **Translation**

If the device is sold to a country in the European Economic Area this technical description must be translated into the language of the country in which the device is to be used. Should the translated text be unclear, the original technical description (German) must be consulted or a member company of the NIVUS-Group must be contacted for clarification.

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## Revision History

Rev.	Modifications	Editor	Date
04	Addresses updated; "Revision History" added; 30062 to 30067 added; 37301, 37303, 37305, 37309, 37311 and 37313 added; "Flow-Through Area" changed to "Wetted Area" in all locations; 30701 and 33001: "scaled" added	MoG	14.11.2024
03	NivuParQ added; controller NivuFlow added	MoG	22.04.2021
02	Examples of 30501 error messages added; minor changes to layout and text	MoG	25.09.2018
01	30511 Operating hours counter added; 35105: 5004 changed to 5104	MoG	14.11.2017
00	New Creation	MoG	20.03.2017

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## General

### 1 Applicable Documentation

Be sure to observe the operating instructions of the respective transmitters NivuFlow 550, 600, 650, 700, 750, 7550, Energy Saver and NivuParQ 850. These manuals are provided with the respective devices or are available as download on the NIVUS homepage.

## Safety

### 2 Disclaimer

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- for personal injury or damage to property resulting from **improper handling**. For safety and warranty reasons, all work on the equipment that goes beyond the installation and connection-dependent measures may only be carried out by NIVUS personnel or by persons or companies authorised by NIVUS.
- for personal injury or damage to property resulting from the operation of the equipment in a **technically faulty** condition.
- for personal injury or damage to property resulting from **improper use**.
- for personal injury or damage to property resulting from failure to observe the **safety instructions** in this instruction manual.
- for missing or incorrect readings due to **improper installation** and for any consequential damage resulting therefrom.

### 3 Duties of the Operator



#### **Important Notice**

*In the EEA (European Economic Area), the national transposition of the Framework Directive (89/391/EEC) as well as the associated individual directives and, in particular, the Directive (2009/104/EC) concerning the minimum safety and health requirements for the use of work equipment by workers at work, as amended, must be observed and complied with.*

*In Germany, the Ordinance on Industrial Safety and Health must be complied with.*

Obtain the local operating licence and observe the associated conditions. In addition, you must comply with environmental protection requirements and local legal requirements for the following:

- Safety of personnel (accident prevention regulations)
- Safety of work equipment (protective equipment and maintenance)
- Product Disposal (Waste Management Act)
- Materials Disposal (Waste Management Act)
- Cleaning (Cleaning Agents and Disposal)

## 4 Requirements for the Personnel

Installation, commissioning and maintenance may only be carried out by personnel who fulfil the following conditions:

- Qualified personnel with appropriate training
- Authorisation by plant operator



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### **Qualified Personnel**

*in the sense of these instructions or the warnings on the product itself are persons who are familiar with the installation, assembly, commissioning and operation of the product and who have the qualifications appropriate to their job, such as*

- I. Training and instruction or authorisation to switch circuits and devices/systems on and off, to earth and to label them in accordance with the standards of safety technology.*
  - II. Training or instruction in accordance with safety technology standards in maintenance and use of appropriate safety equipment.*
  - III. First Aid Training*
-



## Description

### 5 Introduction

Modbus TCP is used as the protocol for real-time data transmission in TCP/IP-capable transmitters by NIVUS. Please refer to the following documents for the necessary information on the protocol level:

[http://www.modbus.org/docs/Modbus\\_Messaging\\_Implementation\\_Guide\\_V1\\_0b.pdf](http://www.modbus.org/docs/Modbus_Messaging_Implementation_Guide_V1_0b.pdf)

[http://www.modbus.org/docs/Modbus\\_Application\\_Protocol\\_V1\\_1b.pdf](http://www.modbus.org/docs/Modbus_Application_Protocol_V1_1b.pdf)

### 6 Description Application Level

The addresses used in the following are so-called "PLC addresses".

Addresses referenced to 0 are used at the protocol level.

Composite measured values (IEEE754 single/double, 32bit signed/unsigned and 64bit signed/unsigned) are available with the least significant register (low/high) first.

The composite measured values must be read in one access.

#### 6.1 Input Registers

Function Code(s):

- "Read Input Registers" (0x04)

Modicon-tag	Protocol Address	Number of Registers	Name
30001	0	1	Measurement Place 1: Flow (scaled)
30002	1	1	Measurement Place 1: Level (scaled)
30003	2	1	Measurement Place 1: Velocity (scaled)
30004	3	1	Measurement Place 1: Water Temperature (scaled)
30005	4	1	Measurement Place 1: Air Temperature (scaled)
30006	5	1	Measurement Place 1: Sound Velocity Medium (scaled)
30007	6	1	Measurement Place 1: Wetted Area (scaled)
30011	10	2	Measurement Place 1: Flow as IEEE754 single (m <sup>3</sup> /s)
30013	12	2	Measurement Place 1: Level as IEEE754 single (m)
30015	14	2	Measurement Place 1: Velocity as IEEE754 single (m/s)
30017	16	2	Measurement Place 1: Water Temperature as IEEE754 single (°C)
30019	18	2	Measurement Place 1: Air Temperature as IEEE754 single (°C)
30021	20	1	Measurement Place 2: Flow (scaled)
30022	21	1	Measurement Place 2: Level (scaled)
30023	22	1	Measurement Place 2: Velocity (scaled)

Modicon-tag	Protocol Address	Number of Registers	Name
30024	23	1	Measurement Place 2: Water Temperature (scaled)
30025	24	1	Measurement Place 2: Air Temperature (scaled)
30026	25	1	Measurement Place 2: Sound Velocity Medium (scaled)
30027	26	1	Measurement Place 2: Wetted Area (scaled)
30031	30	2	Measurement Place 2: Flow as IEEE754 single (m <sup>3</sup> /s)
30033	32	2	Measurement Place 2: Level as IEEE754 single (m)
30035	34	2	Measurement Place 2: Velocity as IEEE754 single (m/s)
30037	36	2	Measurement Place 2: Water Temperature as IEEE754 single (°C)
30039	38	2	Measurement Place 2: Air Temperature as IEEE754 single (°C)
30041	40	1	Measurement Place 3: Flow (scaled)
30042	41	1	Measurement Place 3: Level (scaled)
30043	42	1	Measurement Place 3: Velocity (scaled)
30044	43	1	Measurement Place 3: Water Temperature (scaled)
30045	44	1	Measurement Place 3: Air Temperature (scaled)
30046	45	1	Measurement Place 3: Sound Velocity Medium (scaled)
30047	46	1	Measurement Place 3: Wetted Area (scaled)
30051	50	2	Measurement Place 3: Flow as IEEE754 single (m <sup>3</sup> /s)
30053	52	2	Measurement Place 3: Level as IEEE754 single (m)
30055	54	2	Measurement Place 3: Velocity as IEEE754 single (m/s)
30057	56	2	Measurement Place 3: Water Temperature as IEEE754 single (°C)
30059	58	2	Measurement Place 3: Air Temperature as IEEE754 single (°C)
30061	60	1	Measurement Combi: Flow (scaled)
30062	61	1	Measurement Place Combi: Level (scaled)
30063	62	1	Measurement Place Combi: Velocity (scaled)
30064	63	1	Measurement Place Combi: Water Temperature (scaled)

Modicon-tag	Protocol Address	Number of Registers	Name
30065	64	1	Measurement Place Combi: Air Temperature (scaled)
30066	65	1	Measurement Place Combi: Sound Velocity Medium (scaled)
30067	66	1	Measurement Place Combi: Wetted Area (scaled)
30071	70	2	Measurement Place Combi: Flow as IEEE754 single (m <sup>3</sup> /s)
30091	90	1	Status bits to 30001-05 * <sup>1</sup>
30092	91	1	Status bits to 30021-25
30093	92	1	Status bits to 30041-45
30094	93	1	Status bits to 30061
30101	100	8	Analogue Inputs 1-8 (scaled)
30191	190	1	Status bits to 30101-08
30201	200	4	Analogue Outputs 1-4 (scaled)
30291	290	1	Status bits to 30201-04
30301	300	1	digital Inputs 1-16
30401	400	1	digital Outputs 1-16
30501	500	4	Error Messages 1-64 * <sup>2</sup>
30511	510	2	Operating hours counter in seconds
30601	600	1	Measurement Place 1: Level Pressure (scaled)
30602	601	1	Measurement Place 1: Level Water-Ultrasound (scaled)
30603	602	1	Measurement Place 1: Level Air-Ultrasound (scaled)
30604	603	1	Measurement Place 1: Level 4-20mA (scaled)
30605	604	1	Measurement Place 1: Level i-Sensor (scaled)
30606	605	1	Measurement Place 1: Level 4-20mA (2) (scaled)
30607	606	1	Measurement Place 1: Level Modbus (scaled)
30608	607	1	Measurement Place 1: Level DSP Water-US (1) (scaled)
30609	608	1	Measurement Place 1: Level DSP Water-US (2) (scaled)
30610	609	1	Measurement Place 1: Level Pressure (2) (scaled)
30611	610	1	Measurement Place 1: Level Pressure (3) (scaled)
30612	611	1	Measurement Place 1: Level HART altern. (scaled)
30613	612	1	Measurement Place 1: Level Modbus (2) (scaled)
30622	621	1	Measurement Place 2: Level Water-Ultrasound (scaled)

Modicon-tag	Protocol Address	Number of Registers	Name
30623	622	1	Measurement Place 2: Level Air-Ultrasound (scaled)
30624	623	1	Measurement Place 2: Level 4-20mA (scaled)
30625	624	1	Measurement Place 2: Level i-Sensor (scaled)
30626	625	1	Measurement Place 2: Level 4-20mA (2) (scaled)
30627	626	1	Measurement Place 2: Level Modbus (scaled)
30628	627	1	Measurement Place 2: Level DSP Water-US (1) (scaled)
30629	628	1	Measurement Place 2: Level DSP Water-US (2) (scaled)
30630	629	1	Measurement Place 2: Level Pressure (2) (scaled)
30631	630	1	Measurement Place 2: Level Pressure (3) (scaled)
30632	631	1	Measurement Place 2: Level HART altern. (scaled)
30633	632	1	Measurement Place 2: Level Modbus (2) (scaled)
30641	640	1	Measurement Place 3: Level Pressure (scaled)
30642	641	1	Measurement Place 3: Level Water-Ultrasound (scaled)
30643	642	1	Measurement Place 3: Level Air-Ultrasound (scaled)
30644	643	1	Measurement Place 3: Level 4-20mA (scaled)
30645	644	1	Measurement Place 3: Level i-Sensor (scaled)
30646	645	1	Measurement Place 3: Level 4-20mA (2) (scaled)
30647	646	1	Measurement Place 3: Level Modbus (scaled)
30648	647	1	Measurement Place 3: Level DSP Water-US (1) (scaled)
30649	648	1	Measurement Place 3: Level DSP Water-US (2) (scaled)
30650	649	1	Measurement Place 3: Level Pressure (2) (scaled)
30651	650	1	Measurement Place 3: Level Pressure (3) (scaled)
30652	651	1	Measurement Place 3: Level HART altern. (scaled)
30653	652	1	Measurement Place 3: Level Modbus (2) (scaled)
30691	690	1	Status bits to 30601-07
30692	691	1	Status bits to 30621-27
30693	692	1	Status bits to 30641-47
30701	700	9	Sensor Velocity 1-9 (scaled)
30791	790	1	Status bits to 30701-09
30801	800	9	Sensor Hydraulics Quality 1-9 (0.1 %)
30891	890	1	Status bits to 30801-09
30901	900	9	Sensor Trigger Quality 1-9 (0.1 %)

Modicon-tag	Protocol Address	Number of Registers	Name
30991	990	1	Status bits to 30901-09
31001	1000	16	Sensor 1: Gate Velocity 1-16
31091	1090	1	Status bits to 31001-16
31101	1100	16	Sensor 1: Gate Position 1-16
31191	1190	1	Status bits to 31101-16
31201	1200	16	Sensor 2: Gate Velocity 1-16
31291	1290	1	Status bits to 31101-16
31301	1300	16	Sensor 2: Gate Position 1-16
31391	1390	1	Status bits to 31301-16
31401	1400	16	Sensor 3: Gate Velocity 1-16
31491	1490	1	Status bits to 31401-16
31501	1500	16	Sensor 3: Gate Position 1-16
31591	1590	1	Status bits to 31501-16
31601	1600	16	Sensor 4: Gate Velocity 1-16
31691	1690	1	Status bits to 31601-16
31701	1700	16	Sensor 4: Gate Position 1-16
31791	1790	1	Status bits to 31701-16
31801	1800	16	Sensor 5: Gate Velocity 1-16
31891	1890	1	Status bits to 31801-16
31901	1900	16	Sensor 5: Gate Position 1-16
31991	1990	1	Status bits to 31901-16
32001	2000	16	Sensor 6: Gate Velocity 1-16
32091	2090	1	Status bits to 32001-16
32101	2100	16	Sensor 6: Gate Position 1-16
32191	2190	1	Status bits to 32101-16
32201	2200	16	Sensor 7: Gate Velocity 1-16
32291	2290	1	Status bits to 32201-16
32301	2300	16	Sensor 7: Gate Position 1-16
32391	2390	1	Status bits to 32301-16
32401	2400	16	Sensor 8: Gate Velocity 1-16
32491	2490	1	Status bits to 32401-16
32501	2500	16	Sensor 8: Gate Position 1-16
32591	2590	1	Status bits to 32501-16
32601	2600	16	Sensor 9: Gate Velocity 1-16
32691	2690	1	Status bits to 32601-16
32701	2700	16	Sensor 9: Gate Position 1-16
32791	2790	1	Status bits to 32701-16

Modicon-tag	Protocol Address	Number of Registers	Name
32801	2800	9	Sensor Noise typical 1-9 (0.1 dB)
32891	2890	1	Status bits to 32801-9
32901	2900	9	Sensor Noise max. 1-9 (0.1 dB)
32991	2990	1	Status bits to 32901-9
33001	3000	34	Path Velocity 1-34 (scaled)
33091	3090	1	Status bits to 33001-16
33092	3091	1	Status bits to 33017-32
33093	3092	2	Status bits to 33033-34
33101	3100	68	Pfad Transit Time Differences 1-34 as 32bit signed (ns)
33191	3190	1	Status bits to 33101-32
33192	3191	1	Status bits to 33133-64
33193	3192	1	Status bits to 33165-68
33201	3200	34	Path Sound Velocity 1-34 (0.1 m/s)
33291	3290	1	Status bits to 33201-16
33292	3291	1	Status bits to 33217-32
33293	3292	1	Status bits to 33233-34
33301	3300	34	Path Correlation 1-34 (0.1 %)
33391	3390	1	Status bits to 33301-16
33392	3391	1	Status bits to 33317-32
33393	3392	1	Status bits to 33333-34
33401	3400	34	Path Amplification 1-34 (0.1 dB)
33491	3490	1	Status bits to 33401-16
33492	3491	1	Status bits to 33417-32
33493	3492	1	Status bits to 33433-34
33501	3500	34	Path Noise typical upstream 1-34 (0.1 dB)
33591	3590	1	Status bits to 33501-16
33592	3591	1	Status bits to 33517-32
33593	3592	1	Status bits to 33533-34
33601	3600	34	Path Noise typical downstream 1-34 (0.1 dB)
33691	3690	1	Status bits to 33601-16
33692	3691	1	Status bits to 33617-32
33693	3692	1	Status bits to 33633-34
33701	3700	34	Path Noise max. upstream 1-34 (0.1 dB)
33791	3790	1	Status bits to 33701-16
33792	3791	1	Status bits to 33717-32
33793	3792	1	Status bits to 33733-34

Modicon-tag	Protocol Address	Number of Registers	Name
33801	3800	34	Path Noise max. downstream 1-34 (0.1 dB)
33891	3890	1	Status bits to 33801-16
33892	3891	1	Status bits to 33817-32
33893	3892	1	Status bits to 33833-34
34001	4000	1	Concentration (scaled)
34002	4001	1	< 63 $\mu\text{m}$ (scaled)
34003	4002	1	Quality (scaled 0...1000)
34011	4010	2	Concentration as IEEE754 single (mg/l)
34013	4012	2	< 63 $\mu\text{m}$ as IEEE754 single (mg/l)
34015	4014	2	Quality as IEEE754 single (0...1)
34101	4100	1	Sensor 1: Concentration (scaled)
34201	4200	1	Sensor 1: < 63 $\mu\text{m}$ (scaled)
34301	4300	1	Sensor 1: 63...100 $\mu\text{m}$ (scaled)
34401	4400	1	Sensor 1: 100...200 $\mu\text{m}$ (scaled)
34501	4500	1	Sensor 1: 200...400 $\mu\text{m}$ (scaled)
34601	4600	1	Sensor 1: 400...1000 $\mu\text{m}$ (scaled)
34701	4700	1	Sensor 1: Quality (0.1 %)
35001	5000	4	Measurement Place 1: Total as 64bit signed (l)
35005	5004	4	Measurement Place 1: Positive Sum as 64bit unsigned (l)
35009	5008	4	Measurement Place 1: Negative Sum as 64bit unsigned (l)
35021	5020	4	Measurement Place 2: Total as 64bit signed (l)
35025	5024	4	Measurement Place 2: Positive Sum as 64bit unsigned (l)
35029	5028	4	Measurement Place 2: Negative Sum as 64bit unsigned (l)
35041	5040	4	Measurement Place 3: Total as 64bit signed (l)
35045	5044	4	Measurement Place 3: Positive Sum as 64bit unsigned (l)
35049	5048	4	Measurement Place 3: Negative Sum as 64bit unsigned (l)
35061	5060	4	Measurement Place Combi: Total as 64bit signed (l)
35065	5064	4	Measurement Place Combi: Positive Sum as 64bit unsigned (l)
35069	5068	4	Measurement Place Combi: Negative Sum as 64bit unsigned (l)

Modicon-tag	Protocol Address	Number of Registers	Name
35101	5100	4	Measurement Place 1: Total as IEEE754 double (m <sup>3</sup> )
35105	5104	4	Measurement Place 1: Positive Sum as IEEE754 double (m <sup>3</sup> )
35109	5108	4	Measurement Place 1: Negative Sum as IEEE754 double (m <sup>3</sup> )
35121	5120	4	Measurement Place 2: Total as IEEE754 double (m <sup>3</sup> )
35125	5124	4	Measurement Place 2: Positive Sum as IEEE754 double (m <sup>3</sup> )
35129	5128	4	Measurement Place 2: Negative Sum as IEEE754 double (m <sup>3</sup> )
35141	5140	4	Measurement Place 3: Total as IEEE754 double (m <sup>3</sup> )
35145	5144	4	Measurement Place 3: Positive Sum as IEEE754 double (m <sup>3</sup> )
35149	5148	4	Measurement Place 3: Negative Sum as IEEE754 double (m <sup>3</sup> )
35161	5160	4	Measurement Place Combi: Total as IEEE754 double (m <sup>3</sup> )
35165	5164	4	Measurement Place Combi: Positive Sum as IEEE754 double (m <sup>3</sup> )
35169	5168	4	Measurement Place Combi: Negative Sum as IEEE754 double (m <sup>3</sup> )
35201	5200	2	Measurement Place 1: Total as IEEE754 single (m <sup>3</sup> )
35203	5202	2	Measurement Place 1: Positive Sum as IEEE754 single (m <sup>3</sup> )
35205	5204	2	Measurement Place 1: Negative Sum as IEEE754 single (m <sup>3</sup> )
35221	5220	2	Measurement Place 2: Total as IEEE754 single (m <sup>3</sup> )
35223	5222	2	Measurement Place 2: Positive Sum as IEEE754 single (m <sup>3</sup> )
35225	5224	2	Measurement Place 2: Negative Sum as IEEE754 single (m <sup>3</sup> )
35241	5240	2	Measurement Place 3: Total as IEEE754 single (m <sup>3</sup> )
35243	5242	2	Measurement Place 3: Positive Sum as IEEE754 single (m <sup>3</sup> )
35245	5244	2	Measurement Place 3: Negative Sum as IEEE754 single (m <sup>3</sup> )



Modicon-tag	Protocol Address	Number of Registers	Name
35261	5260	2	Measurement Place Combi: Total as IEEE754 single (m <sup>3</sup> )
35263	5262	2	Measurement Place Combi: Positive Sum as IEEE754 single (m <sup>3</sup> )
35265	5264	2	Measurement Place Combi: Negative Sum as IEEE754 single (m <sup>3</sup> )
36001	6000	9	Status Sensor Check 1-9 (valid as of Firmware Version 2.5.0) 0 – Normal 1 – Maintenance required 2 – Out of Specification 3 – Function Test 4 – Error
36091	6090	1	Status bits to 36001-09
36191	6190	1	Status bits to 36101-16
36192	6191	1	Status bits to 36117-32
37001 *3	7000	2	Measurement Place 1: Flow as IEEE754 single (m <sup>3</sup> /s)
37003 *3	7002	2	Measurement Place 1: Level as IEEE754 single (m)
37005 *3	7004	2	Measurement Place 1: Velocity as IEEE754 single (m/s)
37007 *3	7006	2	Measurement Place 1: Water Temperature as IEEE754 single (°C)
37009 *3	7008	2	Measurement Place 1: Air Temperature as IEEE754 single (°C)
37011	7010	2	Measurement Place 1: Sound Velocity Medium as IEEE754 single (m/s)
37013	7012	2	Measurement Place 1: Wetted Area as IEEE754 single (m <sup>2</sup> )
37101 *3	7100	2	Measurement Place 2: Flow as IEEE754 single (m <sup>3</sup> /s)
37103 *3	7102	2	Measurement Place 2: Level as IEEE754 single (m)
37105 *3	7104	2	Measurement Place 2: Velocity as IEEE754 single (m/s)
37107 *3	7106	2	Measurement Place 2: Water Temperature as IEEE754 single (°C)
37109 *3	7108	2	Measurement Place 2: Air Temperature as IEEE754 single (°C)
37111	7110	2	Measurement Place 2: Sound Velocity Medium as IEEE754 single (m/s)

Modicon-tag	Protocol Address	Number of Registers	Name
37113	7112	2	Measurement Place 2: Wetted Area as IEEE754 single (m <sup>2</sup> )
37201 * <sup>3</sup>	7200	2	Measurement Place 3: Flow as IEEE754 single (m <sup>3</sup> /s)
37203 * <sup>3</sup>	7202	2	Measurement Place 3: Level as IEEE754 single (m)
37205 * <sup>3</sup>	7204	2	Measurement Place 3: Velocity as IEEE754 single (m/s)
37207 * <sup>3</sup>	7206	2	Measurement Place 3: Water Temperature as IEEE754 single (°C)
37208 * <sup>3</sup>	7207	2	Measurement Place 3: Air Temperature as IEEE754 single (°C)
37211	7210	2	Measurement Place 3: Sound Velocity Medium as IEEE754 single (m/s)
37213	7212	2	Measurement Place 3: Wetted Area as IEEE754 single (m <sup>2</sup> )
37301 * <sup>3</sup>	7300	2	Measurement Place Combi: Flow as IEEE754 single (m <sup>3</sup> /s)
37303 * <sup>3</sup>	7302	2	Measurement Place Combi: Level as IEEE754 single (m)
37305 * <sup>3</sup>	7304	2	Measurement Place Combi: Velocity as IEEE754 single (m/s)
37307 * <sup>3</sup>	7306	2	Measurement Place Combi: Water Temperature as IEEE754 single (°C)
37309 * <sup>3</sup>	7308	2	Measurement Place Combi: Air Temperature as IEEE754 single (°C)
37311	7310	2	Measurement Place Combi: Sound Velocity Medium as IEEE754 single (m/s)
37313	7312	2	Measurement Place Combi: Wetted Area as IEEE754 single (m <sup>2</sup> )
37401	7400	18	Sensor Velocity 1-9 as IEEE754 single (m/s)
37501	7500	68	Path Velocity 1-34 as IEEE754 single (m/s)

### Comments

The scaling parameters for the measurement values (except 35001 ff. and 35101 ff.) shall be set on the device. The status registers (address 30091, 30191...) indicate the validity of the respective measurement values.

Bit set at corresponding position → value invalid.

\*1 Example for address 30091:

- Bit 0 → Status Flow
- Bit 1 → Status Level
- Bit 2 → Status Velocity

- Bit 3 → Status Water Temperature
- Bit 4 → Status Air Temperature

\*2 Example for address 30501:

- Bit 0 → Group Error
- Bit 1 → Error V-Measurement
- Bit 2 → Error H-Measurement
- Bit 3 → Error T-Measurement
- Bit 4 → Error external Measurement Value
- Bit 5 → Error Regulator
- Bit 6 → Error System

\*3 See also Modicontag 30011...30059

## 6.2 Holding Registers

Function Code(s):

- “Read Holding Registers” (0x03)
- “Write Single Register” (0x06)
- “Write Multiple Registers” (0x10)

Modicon-tag	Protocol Address	Number of Registers	Name
40201	200	4	Analogue outputs 1-4 (scaled)
40251	250	1	Regulator Reference Value
40401	400	1	Digital Outputs 1-16
40601	600	1	Measurement Place 1 external Height (scaled) (if activated)
40602	601	1	Measurement Place 2 external Height (scaled) (if activated)
40603	602	1	Measurement Place 3 external Height (scaled) (if activated)
40611	610	2	Measurement Place 1 external Height as IEEE754 single (m)
40613	612	2	Measurement Place 2 external Height as IEEE754 single (m)
40615	614	2	Measurement Place 3 external Height as IEEE754 single (m)
40621	620	1	Measurement Place 1 external Height (2) (scaled) (if activated)
40622	621	1	Measurement Place 2 external Height (2) (scaled) (if activated)
40623	622	1	Measurement Place 3 external Height (2) (scaled) (if activated)

40631	630	2	Measurement Place 1 external Height (2) as IEEE754 single (m)
40633	632	2	Measurement Place 2 external Height (2) as IEEE754 single (m)
40635	634	2	Measurement Place 3 external Height (2) as IEEE754 single (m)

### Comments

A **write operation** to these addresses only affects the respective output if it was previously parameterised to "Modbus" on the device. The parameterisation of the transmitter is described in detail in the respective instruction manual.

A **read operation** returns the previously set status, which does not have to match the physical state of the output.

## 6.3 Discrete Inputs

### Function Code(s):

- "Read Discrete Inputs" (0x02)

Modicon-tag	Protocol Address	Number Inputs	Name
10301	300	16	Digital Inputs 1-16
10401	400	16	Digital Outputs 1-16
10501	500	1	Group Error
10502	501	1	Error V-Measurement
10503	502	1	Error H-Measurement
10504	503	1	Error T-Measurement
10505	504	1	Error external Measurement Value
10506	505	1	Error Regulator
10507	506	1	Error System

### Remark

Reading addresses 10401-10416 provides the physical state of the digital output.

## 6.4 Coils/Outputs

### Function Code(s):

- "Read Coils" (0x01)
- "Write Single Coil" (0x05)
- "Write Multiple Coils" (0x0f)

Modicon-tag	Protocol Address	Number Inputs	Name
00401	400	16	Digital Outputs 1-16

### Comments

A **write operation** to addresses 10401-10416 only affects the digital output if it was previously parameterised to "Modbus" on the device. The parameterisation of the transmitter is described in detail in the respective instruction manual.

A **read operation** returns the previously set status, which does not have to match the physical state of the output.