# 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

**Revised Instruction Manual**

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# Revision History

| Rev. | Modifications | Editor | Date |
|---|---|---|---|
| | | | |
| 06 | NIVUS addresses updated;<br>Chap. "*6.1 Input Registers"*: Modicontag 30091 – 30094, 30191, 30291 and 30501 and wording in "*Comments"* updated and supplemented; Chap. "*6.3 Discrete Inputs"* updated and supplemented | MoG | 2026-07-23 |
| 05 | NIVUS addresses updated;<br>Chap. "*6.1 Input Registers"*: Modicontags 35013, 35033, 35053, 35113, 35133, 35153, 35207, 35227 and 35247 added;<br>minor changes in wording and layout | MoG | 2025-07-01 |
| 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 | 2024-11-14 |
| 03 | NivuParQ added; controller NivuFlow added | MoG | 2021-04-22 |
| 02 | Examples of 30501 error messages added; minor changes to layout and text | MoG | 2018-09-25 |
| 01 | 30511 Operating hours counter added; 35105: 5004 changed to 5104 | MoG | 2017-11-14 |
| 00 | New Creation | MoG | 2017-03-20 |

# Table of Contents

**Copyrights and Property Rights 3**

**Revision History 4**

**Table of Contents 5**

**General 6**

1 Applicable Documentation ....6

**Safety 7**

2 Disclaimer....7

3 Duties of the Operator....7

4 Requirements for the Personnel ....8

**Description 9**

5 Introduction....9

6 Description Application Level....9

6.1 Input Registers....9

6.2 Holding Registers....20

6.3 Discrete Inputs ....21

6.4 Coils/Outputs....22

# 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 consequential damages resulting from **a change** in this document. The companies of the NIVUS-Group reserve the right to change the contents of the document including this disclaimer without prior notice.
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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

***Strictly observe and comply with guidelines and requirements***

*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

***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_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 ($m^3/s$) |
| 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 ($m^3/s$) |
| 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 ($m^3/s$) |
| 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 (m³/s) |
| 30091 | 90 | 1 | Status bits to 30001-05<br>- Bit 0 → Status Flow<br>- Bit 1 → Status Level<br>- Bit 2 → Status Velocity<br>- Bit 3 → Status Water Temperature<br>- Bit 4 → Status Air Temperature |
| 30092 | 91 | 1 | Status bits to 30021-25<br>- Bit 0 → Status Flow<br>- Bit 1 → Status Level<br>- Bit 2 → Status Velocity<br>- Bit 3 → Status Water Temperature<br>- Bit 4 → Status Air Temperature |
| 30093 | 92 | 1 | Status bits to 30041-45<br>- Bit 0 → Status Flow<br>- Bit 1 → Status Level<br>- Bit 2 → Status Velocity<br>- Bit 3 → Status Water Temperature<br>- Bit 4 → Status Air Temperature |
| 30094 | 93 | 1 | Status bits to 30061<br>- Bit 0 → Status Flow<br>- Bit 1 → Status Level<br>- Bit 2 → Status Velocity<br>- Bit 3 → Status Water Temperature<br>- Bit 4 → Status Air Temperature |
| 30101 | 100 | 8 | Analogue Inputs 1-8 (scaled) |
| 30191 | 190 | 1 | Status bits to 30101-08<br>- Bit 0 → Status Flow<br>- Bit 1 → Status Level<br>- Bit 2 → Status Velocity<br>- Bit 3 → Status Water Temperature<br>- Bit 4 → Status Air Temperature |
| 30201 | 200 | 4 | Analogue Outputs 1-4 (scaled) |
| 30291 | 290 | 1 | Status bits to 30201-04<br>- Bit 0 → Status Flow<br>- Bit 1 → Status Level<br>- Bit 2 → Status Velocity |

| Modicon-tag | Protocol Address | Number of Registers | Name |
|---|---|---|---|
| | | | - Bit 3 → Status Water Temperature<br>- Bit 4 → Status Air Temperature |
| 30301 | 300 | 1 | Digital Inputs 1-16 |
| 30401 | 400 | 1 | Digital Outputs 1-16 |
| 30501 | 500 | 4 | Error Messages 1-64<br>- Bit 0 → Group Error<br>- Bit 1 → Error V-Measurement<br>- Bit 2 → Error H-Measurement<br>- Bit 3 → Error T-Measurement<br>- Bit 4 → Error external Measurement Value<br>- Bit 5 → Error Regulator<br>- Bit 6 → Error Pump Monitoring<br>- Bit 7 → Error System<br>- Bit 8 → Error v-Sensor Check<br>- Bit 9 → Error Concentration Measurement |
| 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) |
| 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) |

| Modicon-tag | Protocol Address | Number of Registers | Name |
|---|---|---|---|
| 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 %) |
| 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 |

| Modicon-tag | Protocol Address | Number of Registers | Name |
|---|---|---|---|
| 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 |
| 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) |

| Modicon-tag | Protocol Address | Number of Registers | Name |
|---|---|---|---|
| 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 |
| 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) |

| Modicon-tag | Protocol Address | Number of Registers | Name |
|---|---|---|---|
| 34002 | 4001 | 1 | < 63 µm (scaled) |
| 34003 | 4002 | 1 | Quality (scaled 0…1000) |
| 34011 | 4010 | 2 | Concentration as IEEE754 single (mg/l) |
| 34013 | 4012 | 2 | < 63 µm 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 µm (scaled) |
| 34301 | 4300 | 1 | Sensor 1: 63…100 µm (scaled) |
| 34401 | 4400 | 1 | Sensor 1: 100…200 µm (scaled) |
| 34501 | 4500 | 1 | Sensor 1: 200…400 µm (scaled) |
| 34601 | 4600 | 1 | Sensor 1: 400…1000 µm (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) |
| 35013 | 5012 | 4 | Measurement Place 1: Daily total from previous day 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) |
| 35033 | 5032 | 4 | Measurement Place 2: Daily total from previous day 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) |
| 35053 | 5052 | 4 | Measurement Place 3: Daily total from previous day 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 (m³) |
| 35105 | 5104 | 4 | Measurement Place 1: Positive Sum as IEEE754 double (m³) |
| 35109 | 5108 | 4 | Measurement Place 1: Negative Sum as IEEE754 double (m³) |
| 35113 | 5112 | 4 | Measurement Place 1: Daily total from previous day as IEEE754 double (m³) |
| 35121 | 5120 | 4 | Measurement Place 2: Total as IEEE754 double (m³) |
| 35125 | 5124 | 4 | Measurement Place 2: Positive Sum as IEEE754 double (m³) |
| 35129 | 5128 | 4 | Measurement Place 2: Negative Sum as IEEE754 double (m³) |
| 35133 | 5132 | 4 | Measurement Place 2: Daily total from previous day as IEEE754 double (m³) |
| 35141 | 5140 | 4 | Measurement Place 3: Total as IEEE754 double (m³) |
| 35145 | 5144 | 4 | Measurement Place 3: Positive Sum as IEEE754 double (m³) |
| 35149 | 5148 | 4 | Measurement Place 3: Negative Sum as IEEE754 double (m³) |
| 35153 | 5152 | 4 | Measurement Place 3: Daily total from previous day as IEEE754 double (m³) |
| 35161 | 5160 | 4 | Measurement Place Combi: Total as IEEE754 double (m³) |
| 35165 | 5164 | 4 | Measurement Place Combi: Positive Sum as IEEE754 double (m³) |
| 35169 | 5168 | 4 | Measurement Place Combi: Negative Sum as IEEE754 double (m³) |
| 35201 | 5200 | 2 | Measurement Place 1: Total as IEEE754 single (m³) |
| 35203 | 5202 | 2 | Measurement Place 1: Positive Sum as IEEE754 single (m³) |
| 35205 | 5204 | 2 | Measurement Place 1: Negative Sum as IEEE754 single (m³) |
| 35207 | 5206 | 2 | Measurement Place 1: Daily total from previous day as IEEE754 single (m³) |
| 35221 | 5220 | 2 | Measurement Place 2: Total as IEEE754 single (m³) |
| 35223 | 5222 | 2 | Measurement Place 2: Positive Sum as IEEE754 single (m³) |

| Modicon-tag | Protocol Address | Number of Registers | Name |
|---|---|---|---|
| 35225 | 5224 | 2 | Measurement Place 2: Negative Sum as IEEE754 single (m³) |
| 35227 | 5226 | 2 | Measurement Place 2: Daily total from previous day as IEEE754 single (m³) |
| 35241 | 5240 | 2 | Measurement Place 3: Total as IEEE754 single (m³) |
| 35243 | 5242 | 2 | Measurement Place 3: Positive Sum as IEEE754 single (m³) |
| 35245 | 5244 | 2 | Measurement Place 3: Negative Sum as IEEE754 single (m³) |
| 35247 | 5246 | 2 | Measurement Place 3: Daily total from previous day as IEEE754 single (m³) |
| 35261 | 5260 | 2 | Measurement Place Combi: Total as IEEE754 single (m³) |
| 35263 | 5262 | 2 | Measurement Place Combi: Positive Sum as IEEE754 single (m³) |
| 35265 | 5264 | 2 | Measurement Place Combi: Negative Sum as IEEE754 single (m³) |
| 36001 | 6000 | 9 | Status Sensor Check 1-9<br>(valid as of Firmware Version 2.5.0)<br>0 – Normal<br>1 – Maintenance required<br>2 – Out of Specification<br>3 – Function Test<br>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 *1 | 7000 | 2 | Measurement Place 1: Flow as IEEE754 single (m³/s) |
| 37003 *1 | 7002 | 2 | Measurement Place 1: Level as IEEE754 single (m) |
| 37005 *1 | 7004 | 2 | Measurement Place 1: Velocity as IEEE754 single (m/s) |
| 37007 *1 | 7006 | 2 | Measurement Place 1: Water Temperature as IEEE754 single (°C) |
| 37009 *1 | 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 (m²) |

| Modicon-tag | Protocol Address | Number of Registers | Name |
|---|---|---|---|
| 37101 *1 | 7100 | 2 | Measurement Place 2: Flow as IEEE754 single (m³/s) |
| 37103 *1 | 7102 | 2 | Measurement Place 2: Level as IEEE754 single (m) |
| 37105 *1 | 7104 | 2 | Measurement Place 2: Velocity as IEEE754 single (m/s) |
| 37107 *1 | 7106 | 2 | Measurement Place 2: Water Temperature as IEEE754 single (°C) |
| 37109 *1 | 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) |
| 37113 | 7112 | 2 | Measurement Place 2: Wetted Area as IEEE754 single (m²) |
| 37201 *1 | 7200 | 2 | Measurement Place 3: Flow as IEEE754 single (m³/s) |
| 37203 *1 | 7202 | 2 | Measurement Place 3: Level as IEEE754 single (m) |
| 37205 *1 | 7204 | 2 | Measurement Place 3: Velocity as IEEE754 single (m/s) |
| 37207 *1 | 7206 | 2 | Measurement Place 3: Water Temperature as IEEE754 single (°C) |
| 37208 *1 | 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 (m²) |
| 37301 *1 | 7300 | 2 | Measurement Place Combi: Flow as IEEE754 single (m³/s) |
| 37303 *1 | 7302 | 2 | Measurement Place Combi: Level as IEEE754 single (m) |
| 37305 *1 | 7304 | 2 | Measurement Place Combi: Velocity as IEEE754 single (m/s) |
| 37307 *1 | 7306 | 2 | Measurement Place Combi: Water Temperature as IEEE754 single (°C) |
| 37309 *1 | 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 (m²) |

| Modicon-tag | Protocol Address | Number of Registers | Name |
|---|---|---|---|
| 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.

⇨ Examples see Modicontag 30091 – 30094, 30191, 30291 and 30501

*1 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 Pump Monitoring |
| 10508 | 507 | 1 | Error System |
| 10509 | 508 | 1 | Error v-Sensor Check |
| 10510 | 509 | 1 | Error Concentration Measurement |

**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.