# Modbus Register
# TU5400 sc

V1.37

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# TU5400 sc V1.37

| Name | Register | Data Type | Length | Access Mode | Discrete Range | Min / Max | Description |
|---|---|---|---|---|---|---|---|
| TURBIDITY FNU / FTU / NTU / TEF | 40001 | Float | 2 | R | | 0.0 /1000.0 | Turbidity [FNU] |
| TURBIDITY mNTU / mFNU | 40003 | Float | 2 | R | | 0.0 /1000000.0 | Turbidity [mNTU] |
| TURBIDITY EBC | 40005 | Float | 2 | R | | 0.0 /250.0 | Turbidity [EBC] |
| RSD | 40007 | Float | 2 | R | | 0.0 /100.0 | Turbidity [EBC] |
| FLOW RATE | 40009 | Float | 2 | R | | 0.0 /5.0 | Flowrate [l/min] |
| TURBIDITY MIN | 40012 | Float | 2 | R | | 0.0 /1000.0 | minimum measurement range [NTU] |
| TURBIDITY MAX | 40014 | Float | 2 | R | | 0.0 /1000.0 | maximum measurement range depends on calibration type [NTU] |
| EDITED NAME | 40021 | String | 8 | R/W | | | location of sensor |
| RESPONSE TIME | 40029 | Unsigned Integer | 1 | R/W | | Mai 90 | setting measurment rersponse time |
| MEAS UNIT | 40030 | Unsigned Integer | 1 | R/W | | Jul 42 | set unit of measurement for controller screen [6=FNU / 7=NTU / 8=TEF / 9=EBC /20=mNTU / 41=mFNU / 42=FTU] |
| SET RESOLUTION | 40031 | Unsigned Integer | 1 | R/W | | 0 /1 | display resolution selection (normal = 0 / high = 1) |
| BUBBLE REJECT | 40032 | Unsigned Integer | 1 | R/W | | 0 /1 | set bubble rejection On /Off [OFF = 0 / On = 1] |
| LOGGER INTERVAL | 40033 | Unsigned Integer | 1 | R/W | | 0 /7 | set logger interval [0=5s / 1=30s / 2=1min / 3=2min / 4= 5min / 5=10min / 6=15min / 7=30min |
| BUTTON FUNCTION | 40034 | Unsigned Integer | 1 | R/W | | 0 /4 | set function for device button [0=SERVICE / 1=LINK2SC / 2=START WIPE / 3=WIPER REPLACE / 4=BUTTON OFF] |
| FLOW SENSOR | 40037 | Unsigned Integer | 1 | R/W | | 0 /1 | flow unit installed On / Off [OFF = 0 / On = 1] |
| CLEANING UNIT | 40038 | Unsigned Integer | 1 | R/W | | 0 /1 | cleaning unit installed On / Off [OFF = 0 / On = 1] |
| CHECK INTERVAL | 40039 | Unsigned Integer | 1 | R/W | | 0 /6 | interval autoverification of cuvette [0=]OFF / 1=1h / 2=2h / 3=3h /4=6h / 5=12h / 6=24h] |
| SENSITIVITY | 40040 | Unsigned Integer | 1 | R/W | | 0 /1 | sets level of identification of vial clarity error [0=HIGH / 1=LOW] |
| CLEANING INTERVAL | 40041 | Unsigned Integer | 1 | R/W | | 0 /4 | set cleaning interval [0=2h / 1=6h / 2=12h / 3=24h / 4=7days / 9=trigger immerdiate] |
| CLEANING REMINDER | 40042 | Unsigned Integer | 1 | R/W | | 0 /1 | reminder for changing wiper On / Off [OFF = 0 / On = 1] |
| CLEANING LEVEL | 40043 | Unsigned Integer | 1 | R/W | | 0 /1 | Measurment level for cleaning On / Off [OFF = 0 / On = 1] |
| THRESHOLD FNU / FTU /NTU /TEF | 40044 | Float | 2 | R/W | | 0.0 /1000.0 | Measurement threshold for cleaning |
| OUTPUT DELAY | 40051 | Unsigned Integer | 1 | R/W | | 0 /120 | measurement delay after cleaning cycle |
| ACM SOFT VERSION | 40052 | Unsigned Integer | 1 | R | | 0 /65535 | software version og cleaning unit |
| CALIBRATION CURVE | 40053 | Unsigned Integer | 1 | R/W | | 0 /2 | type of calibration [0=STABLCAL / 1=FORMAZIN / 2=CUSTOM] |
| CALIBRATION RANGE | 40054 | Unsigned Integer | 1 | R/W | | 0 /1 | calibration STABLCAL or FORMAZIN [0=1POINT / 1=2POINTS] |
| COUNT OF CALIBRATION POINTS | 40055 | Unsigned Integer | 1 | R/W | | 0 /6 | calibration CUSTOM: count of user points |
| VERIFY AFTER CAL | 40056 | Unsigned Integer | 1 | R/W | | 0 /1 | set verify after cal On /Off [OFF = 0 / On = 1] |
| CALIBRATION MENU GUIDED | 40057 | Unsigned Integer | 1 | R/W | | 0 /2 | set menu guide calibration On / Off [0=OFF / 1=SEALED VIAL / 2=SYRINGE] |
| SET OUTMODE CALIBRATION | 40058 | Unsigned Integer | 1 | R/W | | 0 /2 | otuput mode during calibration [0=HOLD / 1=ACTIVE / 2=SET TRANSFER] |

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| Name | Register | Data Type | Length | Access Mode | Discrete Range | Min / Max | Description |
|---|---|---|---|---|---|---|---|
| CALIBRATION REMINDER | 40059 | Unsigned Integer | 1 | R/W | | 0 /4 | Reminder interval to calibrate [0=OFF / 1=1day / 2=7days / 3=30days / 4=90 days] |
| VERIFICATION MENU GUIDED | 40095 | Unsigned Integer | 1 | R/W | | 0 /2 | setting of type of guide to verificate [0=OFF / 1=SEALED VIAL / 2=SYRINGE] |
| SET OUTMODE VERIFICATION | 40096 | Unsigned Integer | 1 | R/W | | 0 /2 | output mode while verification is active [0=HOLD / 1=ACTIVE / 2=SET TRANSFER] |
| VERIFICATION INTERVALL | 40097 | Unsigned Integer | 1 | R/W | | 0 /4 | reminder interval for verification [0=OFF / 1=1day / 2=7days / 3=30days / 4=90 days] |
| VERIFICATION STANDARD | 40098 | Float | 2 | R/W | | 0.0 /1000.0 | value of verification standard |
| ACCEPT RANGE NTU | 40100 | Float | 2 | R/W | | 0.015 /500 | allowed range for passed verifications in NTU |
| ACCEPT RANGE % | 40102 | Unsigned Integer | 1 | R/W | | 0 /50 | allowed range for passed verifications in % |
| ACCEPT RANGE UNIT | 40103 | Unsigned Integer | 1 | R/W | | 07. Okt | Unit of verification NTU or % [7=NTU / 10=%] |
| SET OUTMODE MNT/TEST | 40115 | Unsigned Integer | 1 | R/W | | 0 /2 | otuput mode during service [0=HOLD / 1=ACTIVE / 2=SET TRANSFER] |
| SERIAL NUMBER | 40116 | String | 6 | R | | | Serialnumber of device |
| PROGRAM | 40122 | Float | 2 | R | | 0.0 /999.99 | Version of application code |
| BOOTPROGRAM | 40124 | Float | 2 | R | | 0.0 /999.99 | Version of bootcode |
| STRUCTURE | 40126 | String | 3 | R/W | | | version of device driver structure |
| PROGRAM AU | 40131 | Unsigned Integer | 1 | R | | 0 /65535 | Version of application code Analytical Unit |
| SERIAL NUMBER AU | 40132 | Unsigned Integer | 2 | R | | 0 /9999999 | Serialnumber of Analytical Unit |
| SER NO PCB AU | 40134 | Unsigned Integer | 2 | R | | 0 /9999999 | Serialnumber of mainboard of Analytical Unit |
| SER NO LASER | 40136 | Unsigned Integer | 2 | R | | 0 /9999999 | Serialnumber of Laser |
| VIAL CONDENSATION STATE | 40139 | Unsigned Integer | 1 | R | | 0 /3 | autoverification result of VIAL (state) [0=OK / 2=ERROR / 3=INACTIVE] |
| VIAL CONDITION STATE | 40140 | Unsigned Integer | 1 | R | | 0 /3 | autoverification result of VIAL (state) [0=OK / 1=ALERT / 2=ERROR / 3=INACTIVE] |
| VIAL CONDENSATION | 40141 | Integer | 1 | R | | 0 /100 | autoverification result of VIAL condensation |
| VIAL CONDITION | 40142 | Integer | 1 | R | | 0 /100 | autoverification result of VIAL condition |
| TOTAL TIME SENSOR | 40177 | Unsigned Integer | 1 | R | | 0 /65535 | time of sensor in use in days |
| WIPER REPLACE | 40178 | Unsigned Integer | 1 | R | | 0 /65535 | Down counter of available wiper cycles |
| VIAL DATE | 40179 | Time2 | 2 | R | | 0 /4294967295 | date of installed VIAL |
| VIAL CLEANING DATE | 40181 | Time2 | 2 | R | | 0 /4294967295 | date of last manual cleaning of VIAL |
| CALIBRATION | 40183 | Time2 | 2 | R | | 0 /4294967295 | date of latest calibration |
| VERIFICATION | 40185 | Time2 | 2 | R | | 0 /4294967295 | date of latest verification |
| FACTORY SERVICE | 40187 | Time2 | 2 | R | | 0 /4294967295 | Date of lastest factory service |
| DESICCANT TIME | 40189 | Unsigned Integer | 1 | R | | 0 /65535 | days since latest desiccant install |
| LOAD | 40190 | Unsigned Integer | 1 | R | | 0 /65535 | status of desiccant |
| PUMP TIME | 40191 | Unsigned Integer | 2 | R | | 0 /999999 | used pump time |
| VIAL PRESENT | 40193 | Unsigned Integer | 1 | R | | 0 /1 | VIAL detected [YES = 1 /NO = 0] |
| LID TYPE | 40194 | Unsigned Integer | 1 | R | | 0 /2 | type of istalled Lid [0=NONE / 1=MEASURE / 2=CALIBRATE] |
| MEAS RAW | 40195 | Float | 2 | R | | -0.04 | signal of measurement channel |
| REF RAW | 40197 | Float | 2 | R | | -0.04 | signal of reference channel |

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| Name | Register | Data Type | Length | Access Mode | Discrete Range | Min / Max | Description |
|---|---|---|---|---|---|---|---|
| HEATER | 40199 | Float | 2 | R | | 0.0 /100.0 | Temperature Laser system |
| RATIO P/L | 40209 | Unsigned Integer | 1 | R | | 0 /100 | Pump ratio |
| HUMIDITY | 40210 | Float | 2 | R | | 0 /100 | humidity condens system |
| TEMP CONDENS | 40212 | Float | 2 | R | | 0.0 /100.0 | temperature condens system |
| SET POINT | 40214 | Unsigned Integer | 1 | R | | 0 /100 | threshold condesation system |
| RATIO P/L WEEK | 40219 | Unsigned Integer | 1 | R | | 0 /100 | Pump ratio (week) |

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# Classified ERROR - Register 49930

| Register (R/O) | Classified Error # Bit | Error | Description |
|---|---|---|---|
| 49930 | 0 | Measurement Calibration Error | not supported |
| 49930 | 1 | Electronic Adjustment Error | not supported |
| 49930 | 2 | Cleaning Error | The last cleaning cycle failed. |
| 49930 | 3 | Measuring Module Error | One or more of the errors TURB TOO HIGH, MEAS ELECTRONIC, PROC HEAD OPEN, VIAL CLARITY or VIAL PRESENT is active. |
| 49930 | 4 | System Re-initialization Error | not supported |
| 49930 | 5 | Hardware Error | One or more of the errors FLASH FAIL, EE RSRVD ERR, TYPE MISMATCH, LASER TOO LOW, AUTOCHK. NO FUNC is active. |
| 49930 | 6 | Internal Communication Error | One or more of the error/warning AU COMM or RFID is active. |
| 49930 | 7 | Humidity Error | Humdity in the drying cycle exceeds limit. |
| 49930 | 8 | Temperature Error | Temperature in the drying cycle exceeds limit. |
| 49930 | 9 | Reserved for Future Use | |
| 49930 | 10 | Sample Warning | not supported |
| 49930 | 11 | Questionable Calibration Warning | not supported |
| 49930 | 12 | Questionable Measurement Warning | One or more of the measurements of the device are of questionable accuracy (Quality bad or out of range). |
| 49930 | 13 | Safety Warning | not supported |
| 49930 | 14 | Reagent Warning | not supported |
| 49930 | 15 | Maintenance Required Warning | A reminder is set, see section 11. |

# Classified STATUS - Register 49931

| Register (R/O) | Classified Status #Bit | Status | Description |
|---|---|---|---|
| 49931 | 0 | Calibration in progress | The device has been placed in a calibration mode. The measurements may not be valid. |
| 49931 | 1 | Cleaning in progress | The device has been placed in a cleaning mode. The measurements may not be valid. |
| 49931 | 2 | Service/Maintenance menu | The device has been placed in a service or maintenance mode in which the measurements may not be valid. |
| 49931 | 3 | Common Error | Device recognizes an error, see Error Registers for Error Class. |
| 49931 | 4 | Measurement 0 Quality Bad | One or more of the errors. |
| 49931 | 5 | Measurement 0 Low Limit | not supported |
| 49931 | 6 | Measurement 0 High Limit | Measurement is above measurement range, Warning or Error: TURB TOO HIGH |
| 49931 | 7 | Measurement 1 Quality Bad | not supported |
| 49931 | 8 | Measurement 1 Low Limit | not supported |
| 49931 | 9 | Measurement 1 High Limit | not supported |
| 49931 | 10 | Measurement 2 Quality Bad | Precision of measurement is out of specified limits. Flow is set to ON and error CLEANING MODULE is set |
| 49931 | 11 | Measurement 2 Low Limit | Measurement is below measurement range. WARNING Low Flow or ERROR No Flow |
| 49931 | 12 | Measurement 2 High Limit | Measurement is above measurement range. WARNING High Flow |
| 49931 | 13 | Measurement 3 Quality Bad | not supported |
| 49931 | 14 | Measurement 3 Low Limit | not supported |
| 49931 | 15 | Measurement 3 High Limit | not supported |

# ERROR List Information – Register 49985 - 86

| Register (R/O) | Error #Bit | Error Description | Comment |
|---|---|---|---|
| 49985 | 0 | EE RSRVD ERR | |
| 49985 | 1 | AU COMM | |
| 49985 | 2 | FLASH FAIL | |
| 49985 | 3 | MEAS ELECTRONIC | |
| 49985 | 4 | PROC HEAD OPEN | |
| 49985 | 5 | CLEANING MODULE | |
| 49985 | 6 | VIAL CLARITY | |
| 49985 | 7 | TURB TOO HIGH | |
| 49985 | 8 | VIAL PRESENT | |
| 49985 | 9 | TYPE MISMATCH | |
| 49985 | 10 | LASER TOO LOW | |
| 49985 | 11 | HUMIDITY PCB | |
| 49985 | 12 | AUTOCHK. NO FUNC | |
| 49985 | 13 | Water Ingress | |
| 49985 | 14 | CAL. CURVE | |
| 49985 | 15 | NOT USED | |
| 49986 | 0 | NOT USED | |
| 49986 | 1 | NOT USED | |
| 49986 | 2 | NOT USED | |
| 49986 | 3 | NOT USED | |
| 49986 | 4 | NOT USED | |
| 49986 | 5 | NOT USED | |
| 49986 | 6 | NOT USED | |
| 49986 | 7 | NOT USED | |
| 49986 | 8 | NOT USED | |
| 49986 | 9 | NOT USED | |
| 49986 | 10 | NOT USED | |
| 49986 | 11 | NOT USED | |
| 49986 | 12 | NOT USED | |
| 49986 | 13 | NOT USED | |
| 49986 | 14 | NOT USED | |
| 49986 | 15 | NOT USED | |

# WARNING List Information – Register 49983 - 84

| Register (R/O) | Warning # Bit | Warning Description | Comment |
|---|---|---|---|
| 49983 | 0 | HUM PCB SC | |
| 49983 | 1 | VIAL CLARITY | |
| 49983 | 2 | TURB TOO HIGH | |
| 49983 | 3 | CLEANING MODULE | |
| 49983 | 4 | NO FLOW | |
| 49983 | 5 | LOW FLOW | |
| 49983 | 6 | HIGH FLOW | |
| 49983 | 7 | WIPER REPLACE. | |
| 49983 | 8 | DRYER EXHAUS'D | |
| 49983 | 9 | SENS.DRY: FUNC | |
| 49983 | 10 | DRYER | |
| 49983 | 11 | PUMP | |
| 49983 | 12 | SENS.DRY: TEMP | |
| 49983 | 13 | SENS.DRY: HUM | |
| 49983 | 14 | NOT DRYING | |
| 49983 | 15 | DESICCANT OLD | |
| 49984 | 0 | LASER-TEMP HIGH | |
| 49984 | 1 | LASER-TEMP SENS. | |
| 49984 | 2 | RFID | |
| 49984 | 3 | NOT USED | |
| 49984 | 4 | NOT USED | |
| 49984 | 5 | NOT USED | |
| 49984 | 6 | NOT USED | |
| 49984 | 7 | NOT USED | |
| 49984 | 8 | NOT USED | |
| 49984 | 9 | NOT USED | |
| 49984 | 10 | NOT USED | |
| 49984 | 11 | NOT USED | |
| 49984 | 12 | NOT USED | |
| 49984 | 13 | NOT USED | |
| 49984 | 14 | NOT USED | |
| 49984 | 15 | NOT USED | |

# Process Event List Information – Register 49987 - 88

| Register | Process Event #Bit | Process Event Description | Comment |
|---|---|---|---|
| 49987 | 0 | CALIBRATION | |
| 49987 | 1 | VERIFICATION | |
| 49987 | 2 | CALIBRATION * | * RFID |
| 49987 | 3 | VERIFICATION * | * RFID |
| 49987 | 4 | CLEANING | |
| 49987 | 5 | SERVICE | |
| 49987 | 6 | WIPER REPLACE. | |
| 49987 | 7 | VIAL REPLACEMENT | |
| 49987 | 8 | VIAL CLEANING | |
| 49987 | 9 | DESICCANT REPL | |
| 49987 | 10 | NOT USED | |
| 49987 | 11 | NOT USED | |
| 49987 | 12 | NOT USED | |
| 49987 | 13 | NOT USED | |
| 49987 | 14 | NOT USED | |
| 49987 | 15 | NOT USED | |
| 49988 | 0 | NOT USED | |
| 49988 | 1 | NOT USED | |
| 49988 | 2 | NOT USED | |
| 49988 | 3 | NOT USED | |
| 49988 | 4 | NOT USED | |
| 49988 | 5 | NOT USED | |
| 49988 | 6 | NOT USED | |
| 49988 | 7 | NOT USED | |
| 49988 | 8 | NOT USED | |
| 49988 | 9 | NOT USED | |
| 49988 | 10 | NOT USED | |
| 49988 | 11 | NOT USED | |
| 49988 | 12 | NOT USED | |
| 49988 | 13 | NOT USED | |
| 49988 | 14 | Prohibited, internal use only | |
| 49988 | 15 | Prohibited, internal use only | |

# Reminder List Information – Register

| Register (R/O) | Reminder #Bit | Process Event Description | Comment |
|---|---|---|---|
| 49919 | 0 | PERFORM CAL | |
| 49919 | 1 | PERFORM VER | |
| 49919 | 2 | WIPER REPLACE. | |
| 49919 | 3 | DRYER RANGE | |
| 49919 | 4 | SENSOR SETUP | |
| 49919 | 5 | NOT USED | |
| 49919 | 6 | NOT USED | |
| 49919 | 7 | NOT USED | |
| 49919 | 8 | NOT USED | |
| 49919 | 9 | NOT USED | |
| 49919 | 10 | NOT USED | |
| 49919 | 11 | NOT USED | |
| 49919 | 12 | NOT USED | |
| 49919 | 13 | NOT USED | |
| 49919 | 14 | NOT USED | |
| 49919 | 15 | NOT USED | |
| 49920 | 0 | NOT USED | |
| 49920 | 1 | NOT USED | |
| 49920 | 2 | NOT USED | |
| 49920 | 3 | NOT USED | |
| 49920 | 4 | NOT USED | |
| 49920 | 5 | NOT USED | |
| 49920 | 6 | NOT USED | |
| 49920 | 7 | NOT USED | |
| 49920 | 8 | NOT USED | |
| 49920 | 9 | NOT USED | |
| 49920 | 10 | NOT USED | |
| 49920 | 11 | NOT USED | |
| 49920 | 12 | NOT USED | |
| 49920 | 13 | NOT USED | |
| 49920 | 14 | NOT USED | |
| 49920 | 15 | NOT USED | |