

## Extension xS54

### Holding registers

v1.1

| Register Address |        | Length | R/W | Data Type      | Content                           | Bit Nr. | Category |
|------------------|--------|--------|-----|----------------|-----------------------------------|---------|----------|
| DEC              | HEX    |        |     |                |                                   |         |          |
| 0                | 0x0000 | 1      | R   | MixedBits      | Digital Inputs                    |         | Basic    |
|                  |        |        |     |                | Digital Input 1                   | 0       |          |
|                  |        |        |     |                | Digital Input 2                   | 1       |          |
|                  |        |        |     |                | Digital Input 3                   | 2       |          |
|                  |        |        |     |                | Digital Input 4                   | 3       |          |
| 1                | 0x0001 | 1      | RW  | MixedBits      | Relay Outputs                     |         | Basic    |
|                  |        |        |     |                | Relay Output 1                    | 0       |          |
|                  |        |        |     |                | Relay Output 2                    | 1       |          |
|                  |        |        |     |                | Relay Output 3                    | 2       |          |
|                  |        |        |     |                | Relay Output 4                    | 3       |          |
|                  |        |        |     |                | Relay Output 5                    | 4       |          |
| 2                | 0x0002 | 2      | R   | float32 / real | Analog Input 1                    |         | Basic    |
| 4                | 0x0004 | 2      | R   | float32 / real | Analog Input 2                    |         | Basic    |
| 6                | 0x0006 | 2      | R   | float32 / real | Analog Input 3                    |         | Basic    |
| 8                | 0x0008 | 2      | R   | float32 / real | Analog Input 4                    |         | Basic    |
| 10               | 0x000A | 2      | R   | float32 / real | Analog Input 5                    |         | Basic    |
| 12               | 0x000C | 2      | R   | float32 / real | Analog Input 6                    |         | Basic    |
| 14               | 0x000E | 2      | R   | float32 / real | Analog Input 7                    |         | Basic    |
| 16               | 0x0010 | 2      | R   | float32 / real | Analog Input 8                    |         | Basic    |
| 18               | 0x0012 | 1      | RW  | MixedBits      | Group MasterWatchDog (MWD) Status |         | Advanced |
|                  |        |        |     |                | MWD Enable                        | 0       |          |
|                  |        |        |     |                | MWD Reboot Detected               | 1       |          |
| 19               | 0x0013 | 2      | RW  | uint32 / uint  | Counter of Digital Input 1        |         | Basic    |
| 21               | 0x0015 | 2      | RW  | uint32 / uint  | Counter of Digital Input 2        |         | Basic    |
| 23               | 0x0017 | 2      | RW  | uint32 / uint  | Counter of Digital Input 3        |         | Basic    |
| 25               | 0x0019 | 2      | RW  | uint32 / uint  | Counter of Digital Input 4        |         | Basic    |
| 27               | 0x001B | 1      | RW  | MixedBits      | User-programmable LED states      |         | Basic    |
|                  |        |        |     |                | User LED 1                        | 0       |          |
|                  |        |        |     |                | User LED 2                        | 1       |          |
|                  |        |        |     |                | User LED 3                        | 2       |          |
| 28               | 0x001C | 1      | RW  | MixedBits      | Synchronised Relay Outputs        |         | Advanced |
|                  |        |        |     |                | Synchronised RO 1                 | 0       |          |
|                  |        |        |     |                | Synchronised RO 2                 | 1       |          |
|                  |        |        |     |                | Synchronised RO 3                 | 2       |          |
|                  |        |        |     |                | Synchronised RO 4                 | 3       |          |
|                  |        |        |     |                | Synchronised RO 5                 | 4       |          |
| 29               | 0x001D | 1      | RW  | MixedBits      | Synchronised Relay Output Locks   |         | Advanced |
|                  |        |        |     |                | Synchronised RO Lock 1            | 0       |          |
|                  |        |        |     |                | Synchronised RO Lock 2            | 1       |          |
|                  |        |        |     |                | Synchronised RO Lock 3            | 2       |          |
|                  |        |        |     |                | Synchronised RO Lock 4            | 3       |          |
|                  |        |        |     |                | Synchronised RO Lock 5            | 4       |          |
|                  |        |        |     |                |                                   |         |          |
| 1000             | 0x03E8 | 1      | R   | uint16 / uint  | Firmware Version                  |         | Expert   |
| 1001             | 0x03E9 | 1      | R   | MixedBits      | Number of I/Os                    |         | Advanced |
|                  |        |        |     |                | Number of DOs                     | 0 - 7   |          |
|                  |        |        |     |                | Number of DIs                     | 8 - 15  |          |
| 1002             | 0x03EA | 1      | R   | MixedBits      | Number of peripherals             |         | Advanced |

|      |        |   |    |               |                                                    |        |          |
|------|--------|---|----|---------------|----------------------------------------------------|--------|----------|
|      |        |   |    |               | Number of internal RS485 lines                     | 0 - 3  |          |
|      |        |   |    |               | Number of AOs                                      | 4 - 7  |          |
|      |        |   |    |               | Number of AIs                                      | 8 - 15 |          |
| 1003 | 0x03EB | 1 | R  | uint16 / uint | Firmware ID                                        |        | Expert   |
| 1004 | 0x03EC | 1 | R  | uint16 / uint | Hardware ID                                        |        | Expert   |
| 1005 | 0x03ED | 2 | R  | uint32 / uint | PCB Serial Number                                  |        | Expert   |
| 1007 | 0x03EF | 1 | RW | MixedBits     | Reserved - Do Not Use                              |        | Expert   |
| 1008 | 0x03F0 | 1 | RW | uint16 / uint | MasterWatchDog (MWD) Timeout (in 1ms)              |        | Advanced |
| 1009 | 0x03F1 | 1 | R  | uint16 / uint | VRef of MCU                                        |        | Expert   |
| 1010 | 0x03F2 | 1 | RW | uint16 / uint | Debounce time (in 100us) for DI 1                  |        | Advanced |
| 1011 | 0x03F3 | 1 | RW | uint16 / uint | Debounce time (in 100us) for DI 2                  |        | Advanced |
| 1012 | 0x03F4 | 1 | RW | uint16 / uint | Debounce time (in 100us) for DI 3                  |        | Advanced |
| 1013 | 0x03F5 | 1 | RW | uint16 / uint | Debounce time (in 100us) for DI 4                  |        | Advanced |
| 1014 | 0x03F6 | 1 | RW | MixedBits     | Enable DirectSwitch functionality                  |        | Basic    |
|      |        |   |    |               | Enable DirectSwitch on DI 1                        | 0      |          |
|      |        |   |    |               | Enable DirectSwitch on DI 2                        | 1      |          |
|      |        |   |    |               | Enable DirectSwitch on DI 3                        | 2      |          |
|      |        |   |    |               | Enable DirectSwitch on DI 4                        | 3      |          |
| 1015 | 0x03F7 | 1 | RW | MixedBits     | Invert DirectSwitch Polarity                       |        | Basic    |
|      |        |   |    |               | Invert DirectSwitch Polarity on DI 1               | 0      |          |
|      |        |   |    |               | Invert DirectSwitch Polarity on DI 2               | 1      |          |
|      |        |   |    |               | Invert DirectSwitch Polarity on DI 3               | 2      |          |
|      |        |   |    |               | Invert DirectSwitch Polarity on DI 4               | 3      |          |
| 1016 | 0x03F8 | 1 | RW | MixedBits     | Enabled DirectSwitch Toggle                        |        | Basic    |
|      |        |   |    |               | Enable DirectSwitch Toggle on DI 1                 | 0      |          |
|      |        |   |    |               | Enable DirectSwitch Toggle on DI 2                 | 1      |          |
|      |        |   |    |               | Enable DirectSwitch Toggle on DI 3                 | 2      |          |
|      |        |   |    |               | Enable DirectSwitch Toggle on DI 4                 | 3      |          |
| 1017 | 0x03F9 | 1 | RW | uint16 / uint | Configuration(U/I/R) of Analog Input 1             |        | Basic    |
| 1018 | 0x03FA | 1 | RW | uint16 / uint | Configuration(U/I/R) of Analog Input 2             |        | Basic    |
| 1019 | 0x03FB | 1 | RW | uint16 / uint | Configuration(U/I/R) of Analog Input 3             |        | Basic    |
| 1020 | 0x03FC | 1 | RW | uint16 / uint | Configuration(U/I/R) of Analog Input 4             |        | Basic    |
| 1021 | 0x03FD | 1 | RW | uint16 / uint | Configuration(U/I/R) of Analog Input 5             |        | Basic    |
| 1022 | 0x03FE | 1 | RW | uint16 / uint | Configuration(U/I/R) of Analog Input 6             |        | Basic    |
| 1023 | 0x03FF | 1 | RW | uint16 / uint | Configuration(U/I/R) of Analog Input 7             |        | Basic    |
| 1024 | 0x0400 | 1 | RW | uint16 / uint | Configuration(U/I/R) of Analog Input 8             |        | Basic    |
| 1025 | 0x0401 | 1 | RW | MixedBits     | RS485 Configuration - see <b>Description</b> sheet |        | Basic    |
|      |        |   |    |               | Baud rate                                          | 0 - 12 |          |
|      |        |   |    |               | Parity enable                                      | 13     |          |
|      |        |   |    |               | Parity-0=Even, 1=Odd                               | 14     |          |
| 1026 | 0x0402 | 1 | RW | uint16 / uint | Modbus Address Configuration (1-254)               |        | Basic    |

## Extension xS54

### Coils

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| Register Address |        | R/W | Content                                       | Category |
|------------------|--------|-----|-----------------------------------------------|----------|
| DEC              | HEX    |     |                                               |          |
| 0                | 0x0000 | RW  | Relay Output 1                                | Basic    |
| 1                | 0x0001 | RW  | Relay Output 2                                | Basic    |
| 2                | 0x0002 | RW  | Relay Output 3                                | Basic    |
| 3                | 0x0003 | RW  | Relay Output 4                                | Basic    |
| 4                | 0x0004 | RW  | Relay Output 5                                | Basic    |
| 5                | 0x0005 | R   | Digital Input 1                               | Basic    |
| 6                | 0x0006 | R   | Digital Input 2                               | Basic    |
| 7                | 0x0007 | R   | Digital Input 3                               | Basic    |
| 8                | 0x0008 | R   | Digital Input 4                               | Basic    |
| 9                | 0x0009 | RW  | User Programmable LED 1                       | Basic    |
| 10               | 0x000A | RW  | User Programmable LED 2                       | Basic    |
| 11               | 0x000B | RW  | User Programmable LED 3                       | Basic    |
| 1000             | 0x03E8 | RW  | MWD reset indication                          | Advanced |
| 1001             | 0x03E9 |     | Reserved - Do Not Use                         | Reserved |
| 1002             | 0x03EA | RW  | Reset group MCU                               | Advanced |
| 1003             | 0x03EB | RW  | Save current configuration and use on startup | Advanced |
| 1004             | 0x03EC |     | Reserved - Do Not Use                         | Reserved |
| 1005             | 0x03ED |     | Reserved - Do Not Use                         | Reserved |
| 1006             | 0x03EE |     | Reserved - Do Not Use                         | Reserved |
| 1007             | 0x03EF | RW  | Enable DirectSwitch on DI 1                   | Advanced |
| 1008             | 0x03F0 | RW  | Enable DirectSwitch on DI 2                   | Advanced |
| 1009             | 0x03F1 | RW  | Enable DirectSwitch on DI 3                   | Advanced |
| 1010             | 0x03F2 | RW  | Enable DirectSwitch on DI 4                   | Advanced |
| 1011             | 0x03F3 | RW  | Invert DirectSwitch Polarity on DI 1          | Advanced |
| 1012             | 0x03F4 | RW  | Invert DirectSwitch Polarity on DI 2          | Advanced |
| 1013             | 0x03F5 | RW  | Invert DirectSwitch Polarity on DI 3          | Advanced |
| 1014             | 0x03F6 | RW  | Invert DirectSwitch Polarity on DI 4          | Advanced |
| 1015             | 0x03F7 | RW  | Enable DirectSwitch Toggle Mode on DI 1       | Advanced |
| 1016             | 0x03F8 | RW  | Enable DirectSwitch Toggle Mode on DI 2       | Advanced |
| 1017             | 0x03F9 | RW  | Enable DirectSwitch Toggle Mode on DI 3       | Advanced |
| 1018             | 0x03FA | RW  | Enable DirectSwitch Toggle Mode on DI 4       | Advanced |

## Extension xS54

### Description

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[Check out the Unipi Knowledge base for more information](#)

Firmware (re)programming tool - [fwserial]

Debian packages: [unipi-firmware-tools], [unipi-firmware6]

#### Configuration (U/I/R) of Analog Inputs

| Value | Type of measurement           |
|-------|-------------------------------|
| 0     | OFF                           |
| 1     | Voltage 0 – 10 V              |
| 2     | Voltage 0 – 2 V               |
| 3     | Current 0 – 20 mA             |
| 4     | Resistance 75 – 2000 $\Omega$ |
| 5     | Resistance 1 – 20 k $\Omega$  |

#### Byte/register order

| Word   | Endianness               |
|--------|--------------------------|
| 16-bit | Big Endian (AB)          |
| 32-bit | Mid-Little Endian (CDAB) |

#### Baud rate configuration

| Value | Speed [bps] |
|-------|-------------|
| 11    | 2400        |
| 12    | 4800        |
| 13    | 9600        |
| 14    | 19200       |
| 15    | 38400       |
| 4097  | 57600       |
| 4098  | 115200      |

#### Default configuration/values

|       | Data           | Value | Description      |
|-------|----------------|-------|------------------|
| DI    | Counter        | 0     | -                |
|       | Debounce       | 50    | 5 ms             |
|       | Direct Switch  | 0     | OFF              |
| AI    | Configuration  | 1     | Voltage 0 – 10 V |
| RO    | State          | 0     | OFF              |
| MWD   | Timeout        | 5000  | 5 s              |
|       | Enable         | 0     | OFF              |
| RS485 | Modbus address | 15    | -                |
|       | Configuration  | 14    | 19200 bps, 8N1   |