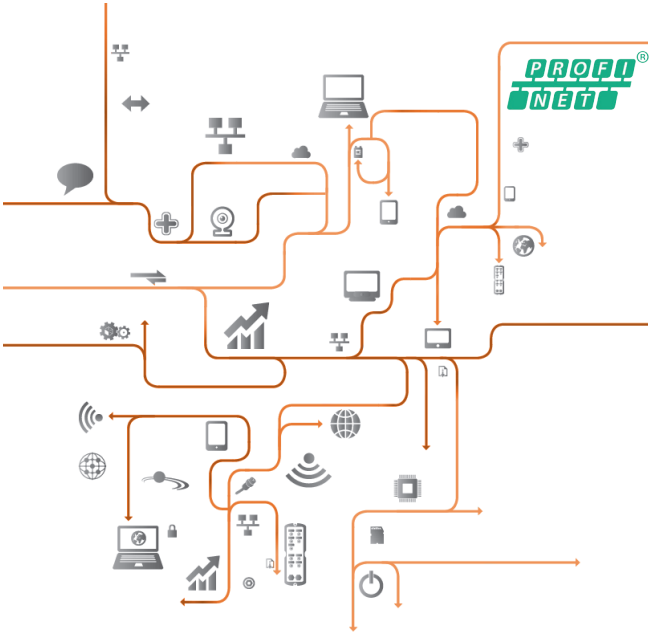
EN

LAW

Simatic Manager S7 und TIA Portal



Project Engineering Instructions

Available as PDF file only
Revision level: 08.04.2016

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1. Functionality

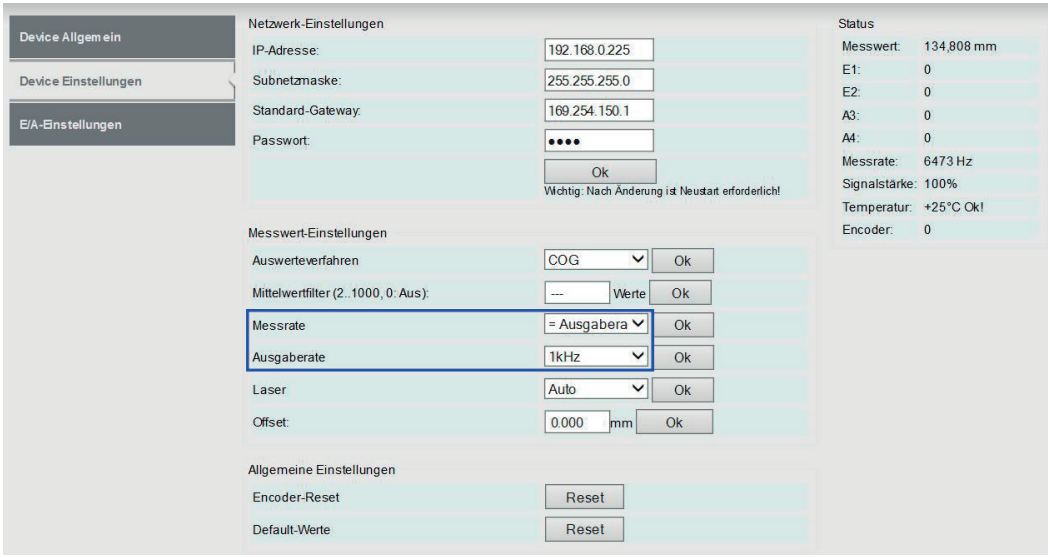
The function module makes the following functionality available to LAW sensors:

- Read-out of header data
- Read-out of data resulting from continuous distance measurement (distance values)
- Read-out of data resulting from extended continuous distance measurement (distance, intensity and encoder values)

2. Initial Start-Up

The sensor's subnet mask, IP address and port must first be selected in the PLC program in order to be able to communicate with the PLC. In this respect it must be assured that the sensor's IP address is within the same range as the IP address of the PLC.

Due to the fact that maximum possible transmission speed depends upon the utilized PLC, we recommend setting the sensor's output rate to 1 kHz and selecting "sampling rate = output rate". The value can be adjusted up or down as required from this setting. Settings can be entered via the sensor's integrated website on the "Device Settings" page:



Initial start-up instructions for the Simatic Manager S7 are included below in section 2.1, and for the TIA Portal in section 2.2

2.1. Simatic Manager S7

2.1.1 Setting the Sensor's Subnet Mask

Symbolic Name	Address	Value (hexadecimal)	Value (decimal)
CON_PARAM.OUCW_1.rem_subnet_id[1]	DB3.DBB28	FF	255
CON_PARAM.OUCW_1.rem_subnet_id[2]	DB3.DBB29	FF	255
CON_PARAM.OUCW_1.rem_subnet_id[3]	DB3.DBB30	FF	255
CON_PARAM.OUCW_1.rem_subnet_id[4]	DB3.DBB31	0	0

2.1.2 Setting the Sensor's IP Address

Symbolic Name	Address	Value (hexadecimal)	Value (decimal)
CON_PARAM.OUCW_1.rem_staddr[1]	DB3.DBB34	C0	192
CON_PARAM.OUCW_1.rem_staddr[2]	DB3.DBB35	A8	168
CON_PARAM.OUCW_1.rem_staddr[3]	DB3.DBB36	0	0
CON_PARAM.OUCW_1.rem_staddr[4]	DB3.DBB37	E1	225

2.1.3 Setting the Sensor's Port Address

Symbolic Name	Address	Value (hexadecimal)	Value (decimal)
CON_PARAM.OUCW_1.rem_tsap_id[1]	DB3.DBB40	0B	
CON_PARAM.OUCW_1.rem_tsap_id[2]	DB3.DBB41	B8	3000

2.1.4 Setting the Type of PLC

Symbolic Name	Address	Value	Comment
CON_PARAM.OUCW_1.local_device_id	DB3.DBB6	1	Typ IM151
		2	Typ CP315

2.2. TIA Portal

2.2.1 Setting the Sensor's Subnet Mask

Name	Value (decimal)
CONNECT.REM_SUBNET_ID[1]	255
CONNECT.REM_SUBNET_ID[2]	255
CONNECT.REM_SUBNET_ID[3]	255
CONNECT.REM_SUBNET_ID[4]	0

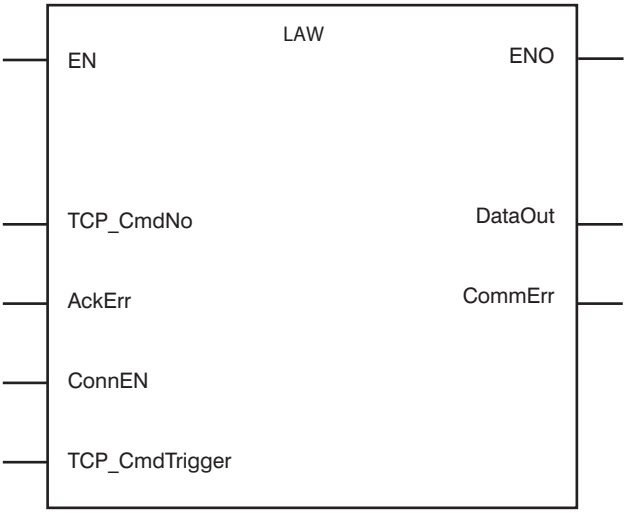
2.2.2 Setting the Sensor's IP Address

Name	Value (decimal)
CONNECT.REM_STADDR[1]	192
CONNECT.REM_STADDR[2]	168
CONNECT.REM_STADDR[3]	0
CONNECT.REM_STADDR[4]	225

2.2.3 Setting the Sensor's Port Address

Name	Value (hexadecimal)
CONNECT.REM_TSAP_ID[1]	0B
CONNECT.REM_TSAP_ID[2]	B8

3. Graphic Description of the LAW Module



4. Parameters Description

4.1. Input Parameters

Input Parameter	Data Type	Description
EN	BOOL	Input enabling
TCP_CmdNo	UINT	The corresponding mode is selected depending on the entry. 2: Continuous measurement 3: Extended continuous measurement 11: Laser on 12: Laser off
AckErr	BOOL	Entry for error detection. 1: Error detected
ConnEN	BOOL	Establish connection with the controller. 1: Activate connection 0: Deactivate connection
TCP_CmdTrigger	BOOL	Input/output argument – controlled by the module

4.2. Output Parameters

Output Parameter		Data Type	Description
ENO		BOOL	Output enabling
DataOut	HeaderCommonOut	STRUCTURE	Read-out of header data for continuous and extended continuous measurement. See detailed description in section 4.2.1
	Data-ContiOut	STRUCTURE	Read-out of data resulting from continuous measurement: See detailed description in section 4.2.2
	Data-ExtContiOut	STRUCTURE	Read-out of data resulting from extended continuous measurement: See detailed description in section 4.2.3
CommErr		BOOL	1: Communication error The sensor's output rate is higher than the PLC's reading rate. Solution: Reduce the sensor's output rate.

4.2.1 Description of the Header

HeaderCommonOut	Data Type	Description
Data Format	DWORD	Read-out of the data format. 4470: continuous distance measurement 4480: extended continuous distance measurement
Sensor Name	Array [1...12] of CHAR	Sensor's order number
Serial Number	Array [1...12] of CHAR	Sensor's serial number
SW-Version	Array [1...10] of CHAR	Software version
OperatingTime	DWORD	Operating time counter in ms
MeasRangeLLin_mm	WORD	Measuring range lower limit in mm
MeasRangein_mm	WORD	Measuring range in mm
LaserPower	WORD	Read-out of laser power in W. Possible values include: 1 (= 0.1 mW) . . . 10 (= 1 mW)
SamplingRate	WORD	Read-out of the sampling rate in Hz. Possible values: 900 . . . 30,000

HeaderCommonOut	Data Type	Description
Temperature	BYTE	Read-out of temperature inside the sensor in °C
EvaluationMethod	BYTE	Read-out of the selected evaluation method. 2: COG 5: edge
RegulatorMode	BYTE	Read-out of settings for laser power and sampling rate. 0: automatic sampling rate regulation and laser power regulation 1: automatic sampling rate, laser power manually adjustable 2: automatic laser power, sampling rate manually adjustable 3: Laser power and sampling rate manually adjustable
EncRightShift	BYTE	Read-out of the scaling factor of the encoder input. 1: every 2nd encoder pulse is counted 2: every 4th encoder pulse is counted . . . 8: every 256th encoder pulse is counted
Status	BYTE	Read-out of the status as a 7-bit value. Bit 0: out-of-range error: intensity or distance is outside of the valid working range Bit 1: internal peak memory overflow error Bit 2: sensor FIFO overflow: CPU processing is unable to keep up with the measurement data Bits 3 to 7: = 0
InOutStatus	BYTE	Read-out of the input/output status as a 7-bit value. Bit 0: status of I/O 1 Bit 1: status of I/O 2 Bit 2: status of I/O 3 Bit 3: status of I/O 4 Bit 7: laser status: 1 = on, 0 = off
OutputRate	WORD	Read-out of the output rate in Hz. Possible values include: 10 . . . 30,000

HeaderCommonOut	Data Type	Description
AverageFilter	WORD	Read-out of the rolling average via x values. Possible values for “x” include: 0; 1= off 2 . . . 1000
Offset	WORD	Read-out of zero-point offset. Possible values for “x” include: -30,000 . . . 30,000 Conversion of offset in bits to offset in mm: *offset [mm] = x / 65,536 × measuring range [mm]*
NumberOfValuesPer-Packet	WORD	Read-out of the number of measured values per packet. Possible values include: In the event of continuous measurement: 1 . . . 450 In the event of extended continuous measurement: 1 . . . 150

4.2.2 Description of Continuous Measurement

Data-ContiOut	Data Type	Description
Distance	Array [1...450] of WORD	Distance value (0 ... 65,535)
Distance_mm	Array [1...450] of REAL	Distance value in mm

4.2.3 Description of Extended Continuous Measurement

Data-ContiOut	Data Type	Description
Distance	Array [1...150] of WORD	Distance value (0 ... 65,535)
Distance_mm	Array [1...150] of REAL	Distance value in mm
Intensity	Array [1...150] of WORD	The intensity value is represented as a 16-bit value. Bits 0 to 11: intensity value (= peak value, 0 to 4095) Bit 12: reserved (= 0) Bit 13: reserved (= 0) Bit 14: error bit: intensity too low or too high Bit 15: error bit: distance outside of measuring range The following formula for converting the digital value into a percentage is used to arrive at the signal strength displayed on the website: *Signal strength as percentage = intensity value / 16*
Encoder	Array [1...150] of WORD	The encoder value is represented as a 16-bit value (0 … 65,535). A converted value in mm cannot be provided here because conversion depends on the utilized encoder and how it's installed.