

6xCt



Counter – SDI-12 - Interface

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UP GmbH

Introduction

Each counter input is individual configurable via SDI-12 commands. Ideal for raingauges, wind sensors, tipping buckets, digital leaf wetness sensors or any sensors with pulse output or Reed-contact.

Connect 6 sensors and SDI-Bus-cable via terminals in robust IP65 housing. Using additional terminals you can connect more then one 6xCt module into the same SDI-12-network.

You can configure each counter using software option Softwareoption auto-reset to reset the counter each time logging (typical for rain) or to add up counts continuously (cumulate signal).


All 6 Counter use the same SDI-12 Bus address. Use aM! Command to call all 6 counter at once (channel 1 to 6) or use commands aM1! to aM6! To call only a single counter value.

Technical Details	
Number of counter inputs	6, individual configurable
Type of input	Reed-contact or pulse Low <1.0V High >2.5V
Resolution	32bit counter
Max. input frequency	1kHz
Output	SDI-12
Power Supplay	12Vdc @ 15mA
Housing	180x80x80mm, IP65, Polyester
Temperature range	-20°C bis +80°C
Cable inlet (choose layout)	6x Sensor, 2x SDI-Bus via M12 Cable glance 6x Sensor via M12 Cable glance, 1x SDI-12 via M12 Socket

Quickstart

First check your delivery note for non default settings, which might have been already done for your project.

SDI-12 Bus	
Blue	SDI-GND
Grey	SDI-Signal
Orange	SDI-Power



6xCounter-Inputs L-mode	
Blue	GND
Grey	Pulse
Orange	Uv out

6xCounter-Inputs H-mode (reed-contact) (default)	
Blue	Contact-closure wire 1
Grey	Contact-closure wire 2
Orange	n.c.

Default Settings

Hardware connection: H-Mode

(this is the same for all 6 channels)

Debounce time: 20ms (maximum frequency 50Hz with this setting)

Factor=1 Offset=0 not used yet

Auto-reset= ON (after reading a counter value automatic reset of the counter value)

SDI-address: 0 (see address label inside)

Basic commands (a = address of your sensor)

Make a measurement	aM!	All 6 counter values at once
	aM1! ... aM6!	Each single counter value
Change an address	aAb	change address from a to b
Call Identification string	ai!	A typical result would be a13UP_GmbH6xCt101.010006

SDI-12 Overview

The commands to set up and operate the SDI-12 6xCt module are those defined by the SDI-12 specifications plus some extended commands defined by UP GmbH. The commands are in ASCII and all the replies use printable ASCII characters followed by <CR> <LF>. The case of the letters is important. An "A" is not the same as an "a".

All commands have three components: the device address, the command body, and the command termination.

The device address is a single character with values 0 to 9, A to Z, and a to z. It is the first character of a command. It is usually the number 0 (the default address as shipped from the factory) if data recorder does not have multiple SDI devices connected to it.

The command body and the responses are shown as a combination of upper and lower case letters.

The upper case letters are the fixed portions of the command and the lower case letters are the variables or values that are replaced by actual numbers. Values are entered in the form of a polarity sign (+ or -) followed by up to seven digits, including a decimal point.

The command terminator is an exclamation point (!).

NOTE: ALL SDI-12 COMMANDS ARE UPPER CASE.

Setting the address (default address 0)

Command		comments
aAn!	a old address / n new address	Address available 0-9, A-Z, a-z

Call for Identification

Command		Answer
all	Call Identification string	allccccccmmmmmmvvvxxx<CR><LF>

a	Sensors address
ll	the SDI-12 version number, indicating SDI-12 version command compatibility; for example, version 1.3 is encoded as 13
cccccc	Example UP_GMBH
mmmmm	6 characters specifying the sensor model number example 6xCt10 6xCt module 10 Hardware Layout 1.0
vvv	3 characters specifying the sensors firmware version Example 1.1
xxxxx	5 characters, used for a serial number example .10024

Do a measurement

Command		Answer
aM!	Do a measurement on all counter inputs	att6 indication, that after ttt seconds 6 values are ready to call with D-commands (most recorders will do automatically handling this issue and go on with D-commands)

Alternative commands to get only one value

aM1! Do a measurement on counter 1, using settings like individual configured
aM2! Do a measurement on counter 2, using settings like individual configured
aM3! Do a measurement on counter 3, using settings like individual configured
aM3! Do a measurement on counter 4, using settings like individual configured
aM5! Do a measurement on counter 5, using settings like individual configured
aM5! Do a measurement on counter 6, using settings like individual configured

Set Parameter for each counter channel (extended command)

Command		comments
aXS1+s+o+t+f+i+r+v+m +c!	Set parameters for counter 1	See list below for details of each channel
...	...	
aXS6+s+o+t+f+i+r+v+m +c!	Set parameters for counter 6	

Parameter	Default	Description
s	1	Slope: Factor for linear calculation of engineering units
o	0	Offset: Offset for linear calculation of engineering units
t	0	initial Value: start-value for a counter this parameter makes sense only when not running in auto-reset mode to start on a certain value not available in Firmware 1.4
f	1	Time period in s for frequency measurements Not used yet
i	H	Hardware Input setup (NOTE This setting is always the same for all 6 channels whereas all other parameters from this table are individual) L=Enable internal pull-down (= active pulses: Low <1.0V High >2.5V) H=Enable internal pull-up, (typical for Reed-contact) Default
r	1	r : auto-reset default=1=on other option r=0=off auto-reset means immediately after getting a counter value the counter is reset
v	20	Debounce time in ms to avoid bouncing. For manual switches you may even set this value to 200ms to avoid To measure up to 1kHz you need to set this value to 0, using raingauges a value of 20ms or higher is a good choice (depending on your sensor)
m	C	Set Type of Measurement: only C is available til Firmware 1.3
	C	Counts : counter without any calculations done, but using debounce value and auto-reset , available since Firmware 1.0
	B	Buckets , same as counts, but with additional calculation using factor and offset and initial value – available since Firmware 1.4
	S	Status result is 1 or 0 depending on weather the contact is closed or open while measuring, not available in Firmware 1.4
	F	Frequency output gabe=((counts/f) x s) + o), not available in Firmware 1.4
	P	Periode voutput is period time of pulsetime in ms, not used in Firmware 1.4
c	0	continuous mode on =1 or off=0 to measure statistics over a certain time: Minimum, Average, Maximum, not available in Firmware 1.4

Get Parameter for each channel

Command		comments
aXG1!	Get parameters for counter 1	See list above for details of each channel
...	...	
aXG6!	Get parameters for counter 6	

Example:

aXG1! a+1+0+0+1+H+1+20+C+0

Final remark

If you have any questions, wishes or ideas regarding your SDI-12 - Application or in regard to this manual you are welcome to get in contact with us. Your UP Team.

UP GmbH

Bockradenerstrasse 52b

49477 Ibbenbüren

GERMANY

www.upgmbh.com

s.schweighoefer@upgmbh.com