

# S40 Series



## Ruggedised, low-power radio nodes

S40 Series covers most of the needs for metering or environmental monitoring applications



A probe for every need

Pulse counting, light pulse counting, temperature, relative humidity, and more to come...

Multiple radios



LoRaWAN™, Wireless M-Bus, and more to come...



Environmental Monitoring



Rugged

IP68-rated, tropicalised, non-potted design lets the user properly dispose of, or replace, the battery

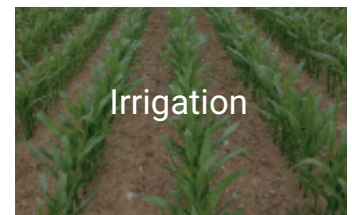
Ultra-long battery life



Single C battery-operated for field operation up to 15 years



Smart Metering



Irrigation

# S40 SERIES SPECIFICATIONS

## HARDWARE

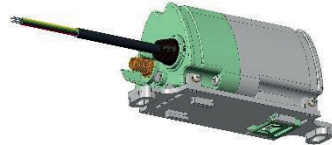
<b>MATERIAL</b>	(f1) UV-resistant per UL 746C, HB non-flammable per UL 94, polycarbonate plus polybutylene terephthalate ("PBT+PC")
<b>DIMENSIONS (MM)</b>	44 x 73 <sup>3</sup> x 44 without connectors
<b>WEIGHT AND SPQ</b>	Approx. 180 g; commercial flight-friendly 15-piece SPQ (< 5 kg)
<b>TEMPERATURE RANGE</b>	✓ Operating: -20 °C ~ +70 °C ✓ Storage: -40 °C ~ +85 °C
<b>POWER</b>	30 <sup>6</sup> Wh, non-rechargeable, lithium thionyl chloride C battery ✓ 32-bit ARM® Cortex™-M3 architecture; running at 40 MHz ✓ Built-in 128 KB *Flash memory* and 32 KB RAM
<b>MCU</b>	✓ Built-in cryptographic engine supporting (i) AES 128- and 256-bit keys; and (ii) ECC B/K163, B/K233, P192, P224, P256; and (iii) SHA-1 and SHA-2 (SHA-224 and SHA-256)
<b>TÜV-CERTIFIED IP68 RATING</b>	Immersion at up to, per IEC 60529 standard: ✓ 1 <sup>0</sup> metre for up to forty minutes (external antenna models); or ✓ 1 <sup>2</sup> metre for up to one hour (internal antenna models) PCB/A conformally coated against condensation, if the case arises

## SOFTWARE

<b>TIME STAMPING</b>	Yes, courtesy of a network-adjustable RTC with a less than three (3) seconds per month drift
<b>DATA HISTORY</b>	4 [resp. 48] records, in case of S41 [resp. S47]
<b>ENCRYPTION</b>	Hardware-assisted AES128, in case of S41 only

## OPERATION AND CONTROLS

<b>ESTIMATED LIFE SPAN</b>	✓ S41: fifteen (15) years with a 15-minute transmission cycle ✓ S47: twelve (12) years with a 30- (models 03, 04; 08; 01, 07, 10, 11) or 60-minute (models 06; 02, 05, 09) transmission cycle
<b>MAGNETIC SWITCH</b>	ON / OFF; Reset
<b>OPERATING STATUS LED</b>	One, white
<b>TRANSMISSION CYCLE</b>	Adjustable over the air in one-minute increments, from 2 mn to 1,440 mn; factory-set at 15 [resp. 30] mn in case of S41 [resp. S47]
<b>S47'S ACTIVATION METHOD</b>	✓ Over-the-air activation (OTAA) ✓ Activation by personalisation (ABP)



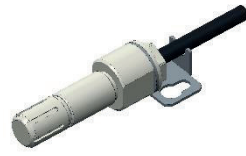
S40 unit with its optional DIN Rail clip / Mounting bracket



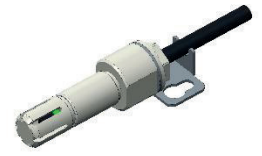
Termination of the wire harness of the Pulse counter (three stripped wires)



Light pulse counting probe



Surface temperature probe (waterproof)



Relative humidity / Ambient temperature probe

## RADIO TYPES

<b>LONG RANGE (LORA®) OR STANDARD (FSK) WIRELESS M-BUS</b>	<ul style="list-style-type: none"> <li>✓ Either LoRa® modulation (factory setting) or standard FSK modulation (user-reconfigurable to, then compliant with the Open Metering System specification <a href="http://oms-group.org/">http://oms-group.org/</a>)</li> <li>✓ Bubble-Up® operation with Listen Before Talk ("LBT")</li> <li>✓ Very fine granularity, perfectly suited to the business of Energy consumption optimisation</li> </ul>
<b>LORAWAN®</b>	Class A, with a -140 dBm receiving sensitivity and a max. EIRP of: <ul style="list-style-type: none"> <li>✓ 12<sup>-15</sup> dBm in 'EU433'<sup>5</sup> and China @779 ~ 787 MHz</li> <li>✓ 14 dBm<sup>1</sup> in South Korea and Indonesia</li> <li>✓ 16 dBm in 'EU868', Russia, 'AS923'</li> <li>✓ 19<sup>-15</sup> dBm in China @470 ~ 510 MHz</li> <li>✓ 22 dBm in 'US915', 'AU915' and India</li> </ul>

## A PROBE FOR EVERY NEED

<b>PULSE COUNTING</b>	Three AWG24 stripped wires – cf. 1 <sup>st</sup> picture below – with: <ul style="list-style-type: none"> <li>✓ 219 µA current</li> <li>✓ 670 µF capacitance</li> <li>✓ 25 ms max. pulse duration</li> <li>✓ 0<sup>2</sup> mW max. power</li> <li>✓ 330 mH inductance</li> <li>✓ 15 Hz max. frequency</li> </ul>
<b>LIGHT PULSE COUNTING</b>	cf. 2 <sup>nd</sup> picture below
<b>SURFACE TEMPERATURE MEASUREMENT</b>	<ul style="list-style-type: none"> <li>✓ via a stainless-steel, 10 mm-wide, waterproof probe – cf. 3<sup>rd</sup> picture below</li> <li>✓ -50 °C ~ +150 °C range; ±0<sup>3</sup> °C accuracy from +10 °C to +90 °C, ±0<sup>6</sup> °C from -20 °C to +110 °C, ±1<sup>2</sup> °C otherwise</li> <li>✓ Please consult us for higher accuracies (yet narrower ranges)</li> </ul>
<b>RELATIVE HUMIDITY / AMBIENT TEMPERATURE MEASUREMENT</b>	<ul style="list-style-type: none"> <li>✓ via a stainless-steel, 10 mm-wide probe – cf. 4<sup>th</sup> picture below</li> <li>✓ HUMIDITY: 0 % RH ~ 100 % RH range; ±2 % RH accuracy</li> <li>✓ TEMPERATURE: -40 °C ~ +125 °C range; ±0<sup>5</sup> °C accuracy from +5 °C to +50 °C</li> <li>✓ Please consult us for any other I<sup>2</sup>C sensor</li> </ul>
<b>ANY CURRENT LOOP SENSOR READING</b>	<ul style="list-style-type: none"> <li>✓ Two AWG24 stripped wires to connect to any current loop (aka 4 mA ~ 20 mA) sensor</li> <li>✓ Please consult us for any 0 V ~ 10 V or 0 V ~ 5 V sensor (RTD?)</li> </ul>

\*FACTORY OPTIONS\* (subject to MOQ and other considerations)

**FLASH MEMORY** Doubled to 256 KB

## ACCESSORIES

<b>EXTERNAL ANTENNAS</b>	High radiation efficiency, straight dipole terminal antennas <ul style="list-style-type: none"> <li>✓ A48H0 for S41xxUS, S47xx1S, S47xx9S, S47xxAS models</li> <li>✓ A49H0 for S47xx2S, S47xx5S, S47xx7S, S47xx8S models</li> </ul>
<b>RIGHT ANGLE ADAPTOR</b>	For either A48H0 or A49H0, when and if an S40 unit is mounted horizontally
<b>DIN RAIL CLIP</b>	2½ U width; doubling as a 2-hole mounting bracket

MODEL NAME	'ZONE'	RADIO TYPE	FREQUENCIES (MHZ)	PLANNED / OBTAINED CERTIFICATIONS <sup>2</sup>	FCS <sup>3</sup>	ORDER CODE				
						PULSE COUNTER	LIGHT PULSE COUNTER	THERMOMETER	HYGROMETER	ANY CURRENT LOOP SENSOR <sup>4</sup>
S41	Europe	Wireless M-Bus	169 <sup>4</sup> ~ 169 <sup>475</sup>	CE <sup>8</sup>	May '19	S4101VS	S4102VS	S4103VS	S4104VS	S4105VS
			868			S4101US	S4102US	S4103US	S4104US	S4105US
S47	'EU433' <sup>5</sup>	LoRaWAN® (certified by TÜV)	433	CE <sup>8</sup> , ICASA	May '19	S47014S	S47024S	S47034S	S47044S	S47054S
	'EU868' <sup>6</sup>		863 ~ 870			S47011S	S47021S	S47031S	S47041S	S47051S
	Russia		864 ~ 870			S4701AS	S4702AS	S4703AS	S4704AS	S4705AS
	'US915' <sup>7</sup>		902 ~ 928	FCC	TBD	S47012S	S47022S	S47032S	S47042S	S47052S
	'AU915' <sup>7</sup>		915 ~ 928	RCM		S47015S	S47025S	S47035S	S47045S	S47055S
	'AS923' <sup>7</sup>		923	JRF; NBTC; <b>IMDA</b>		S47017S	S47027S	S47037S	S47047S	S47057S
	South Korea; Indonesia		920 ~ 923	KC; Postel	May '19	S47018S	S47028S	S47038S	S47048S	S47058S
	China		470 ~ 510	TBD	TBD	S47016S	S47026S	S47036S	S47046S	S47056S
			779 ~ 787			S47013S	S47023S	S47033S	S47043S	S47053S
	India		865 ~ 867	ETA, TEC		S47019S	S47029S	S47039S	S47049S	S47059S

Please consult us regarding the models or features shown in grey, which are subject to MOQ and other considerations

<sup>1</sup> 10 dBm only in the lower half of the band

<sup>2</sup> Besides **MIL-STD-810H**, by Switzerland's SGS and, upon request, AtEx, IEC Ex, etc. for use in explosive atmospheres

<sup>3</sup> First customer shipment [date of]

<sup>4</sup> aka 4 mA ~ 20 mA sensors; if you preferred 0 V ~ 10 V [resp. 0 V ~ 5 V] analogue sensors, please substitute in the order code 06 [resp. 07] for 05

<sup>5</sup> i.e. ...

<sup>6</sup> i.e. Bahrain and Nigeria, where no other 'zone' is suitable; also suited to Albania, Armenia, Bangladesh, Belarus, Bosnia and Herzegovina, Cambodia, Egypt, the European Union, Iceland, Iran, Laos, Lebanon, Liechtenstein, Macedonia, Moldova, Montenegro, Morocco, Myanmar, New Zealand, Norway, Oman, Pakistan, the Philippines, Qatar, Saudi Arabia, Serbia, Singapore, South Africa, Switzerland, Tunisia, Turkey, Ukraine, the United Arab Emirates, Vietnam

<sup>7</sup> i.e. Costa Rica, Japan, Taiwan and Venezuela, where no other 'zone' is suitable; also suited to Australia, Bolivia, Brunei Darussalam, Cambodia, Chile, Ecuador, El Salvador, Guatemala, Hong Kong, Laos, Malaysia, New Zealand, Pakistan, Panama, Paraguay, Peru, Singapore, Thailand, Uganda, Uruguay

<sup>8</sup> Based on compliance with RED, etc.