

# Model 5716/5796 Wireless Double-Ended Load Pins

## Description

Model 5716/5796 Wireless Load Pins (WLP) are specially developed by BCM SENSOR for traditional ratchet tie-down straps (RTS), in order to monitor the tightening status of the straps when they are used to fasten cargo. After the WLP is integrated in a traditional RTS, the latter becomes a Smart RTS (SRTS, model SR5716/SR5796). Multiple of such the SRTS can work with one WSN1000 monitor to form a Wireless Tension-Detect-and-Alert System (WTDAS, model WFMS1000) for cargo safety application.

The 5716/5796 WLP consists of a double-ended shear beam force sensor and a WSSC (wireless sensor signal conditioner). The force sensor is made of metal foil strain gauges from BCM SENSOR and has its sensor body made from either nickel-plated mild steel (model 5716) or stainless steel (model 5796) while the WSSC, together with its antenna and batteries, is integrated in a PTFE housing. This housing is mounted on the sensor body via thread and the junction of the both is sealed with silicone rubber to ensure the IP66 protection rating for of the WLP. As a result, the WLP can be used in wet weather conditions.

The standard WSSC employs 2.4GHz radio frequency (RF) and in-house protocol to communicate with the WSN1000 monitor wirelessly. For a customer-tailored application where a specific protocol (e.g., Zigbee, NoRa, etc.) is required, BCM SENSOR can modify the WSSC to meet customer needs with the 5716/5796 WLP.



5716/5796 WLP



SR5716 Smart RTS



WSN1000 Monitor

## Features

- robust design;
- internal antenna;
- license-free 2.4GHz RF;
- suitable for all-weather conditions.

## Applications

- cargo safety in truck transportation

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### Technical Data

Parameters		Units	Specifications	Notes
capacity		kg	300, 500, 750	1&2
safe overload		%fs	150	3
ultimate overload		%fs	200	
communication signal			2.4GHz RF	
communication distance		m	up to 100 through open space	
sampling	measuring data rate		10 data/second, adjustable to fit applications	
	sending data rate		1 time per 5 minutes, adjustable to fit applications	
accuracy of tension monitoring		%fs	±5	4
threshold			±10% of set load, adjustable to fit applications	5
supply voltage		Vdc	3.6 via two 1/2 AA batteries	
battery life			depending on use conditions	6
operating temperature range		°C	-20 ~ +60	
storage temperature range		°C	-20 ~ +60	
load pin body material			5716: nickel-plated mild steel, 5796: stainless steel	
material of housing for electronics			PTFE	
environment protection			IP66	
net weight		gram	~500	

- Notes:
1. The capacity refers to the maximum tension load which can be set for a WLP by WSN1000 monitor.
  2. For customized capacity, consult BCM.
  3. "fs" refers to full scale of capacity.
  4.  $accuracy = \sqrt{\text{non-linearity}^2 + \text{hysteresis}^2 + \text{repeatability}^2}$ .
  5. If the set load is 500kg by the WSN1000 monitor, the lower threshold will be 450kg (= 500kg x 90%) while the upper threshold will be 550kg (= 500kg x 110%). This means, in case the strap becomes loosened and the WLP senses that the tension is lower than 450kg, the corresponding LED on the WSN1000 monitor will be switched from green to red color and the alarm will go off.
  6. Under the conditions of 25°C, 5m communication distance without obstacles, and sampling rate as listed above, the battery life is about one year. A lower temperature, a higher sampling rate, or a further communication distance will lead to a shorter battery life.

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### Ordering Information

<b>position (pos.) 1: model</b>							
5716: made from nickel-plated mild steel (standard) 5796: made from stainless steel							
<b>pos. 2: capacity</b>							
300kg 500kg 750kg							
<b>pos. 3: measuring data rate</b>							
10: 10 data per second							
<b>pos. 4: sending data rate</b>							
1/5: 1 time per 5 minutes							
<b>pos. 5: accuracy</b>							
5%fs							
<b>pos. 6: threshold</b>							
10%							
<b>pos. 7: environment protection</b>							
IP66							
<b>pos. 8: customized specifications</b>							
“(*)” is necessary only if any customized parameter is required, otherwise it is neglectable.							
<b>pos.1</b>	<b>pos. 2</b>	<b>pos. 3</b>	<b>pos. 4</b>	<b>pos. 5</b>	<b>pos. 6</b>	<b>pos. 7</b>	<b>pos. 8</b>

### Examples of Ordering Code

- standard WLP:  
5716-750kg-10-1/5-5%fs-10%-IP66
- customized WLP:  
5796-500kg-10-1/20-5%fs-10%-IP66-(\*)  
(\*): Customized sending data rate = 1 time per 20 minutes.

The listed dimensions, specifications and ordering information are subject to change without prior notice.

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