

## TECHNICAL SPECIFICATION

### PantoScanner Mark 6



#### PANTOSCANNER TECHNICAL SPECIFICATIONS

##### PERFORMANCE

Vehicle speed	Min	5 km/h
	Max	Standard version: 200 km/h High-speed version: 350 km/h
Vehicle direction		Bidirectional
Carbon strip lengths		650 – 1650 mm
Ambient temperature		-40 to +50 °C / -40 to +122 °F
Ambient humidity		Up to 98%

##### INSTALLATION

Scanner size (excl. mounting/servicing system)	L: 812 x W: 380 x H: 375 mm
Scanner weight (excl. options)	45 kg
Scanner enclosure	Stainless Steel with Aluminium plates
Scanner height above catenary wire	1800 – 2000 mm
Power supply	1 x 230 V, 10 A, max. 1 kW (consumption at rest without TEC: 70 Watt)
Isolation class	IP66
Network connectivity	10 Mbit/s recommended, min. 2 Mbit/s or 3G
Additional track-side equipment	RFID reader

##### SERVICE

On-site maintenance	Depending on local conditions, typically twice per year
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#### PANTOSYSTEM TECHNICAL SPECIFICATIONS

##### PANTOSERVER

Hosting	On-premises, or in PantoCloud
Operating system	Microsoft Windows Server
Integration options	PantoAPI (REST), local vehicle information systems, email, (S)FTP
Time to process recorded data	Typically < 10 seconds
Capacity	Storage capacity limited by disk space only

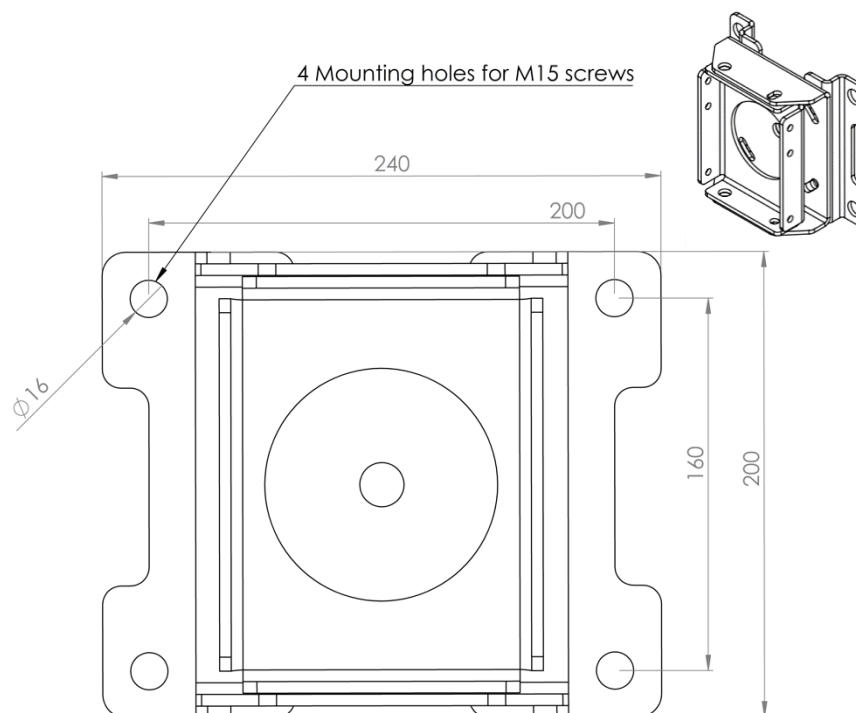
##### PANTOCLIENT

Operating system	Any web browser, fully supports smart phones and tablets
Language support	English, Deutsch, Français, Español, Nederlands, Dansk, Norsk, Polskie, Slovenský, Chinese Simplified, Chinese Traditional

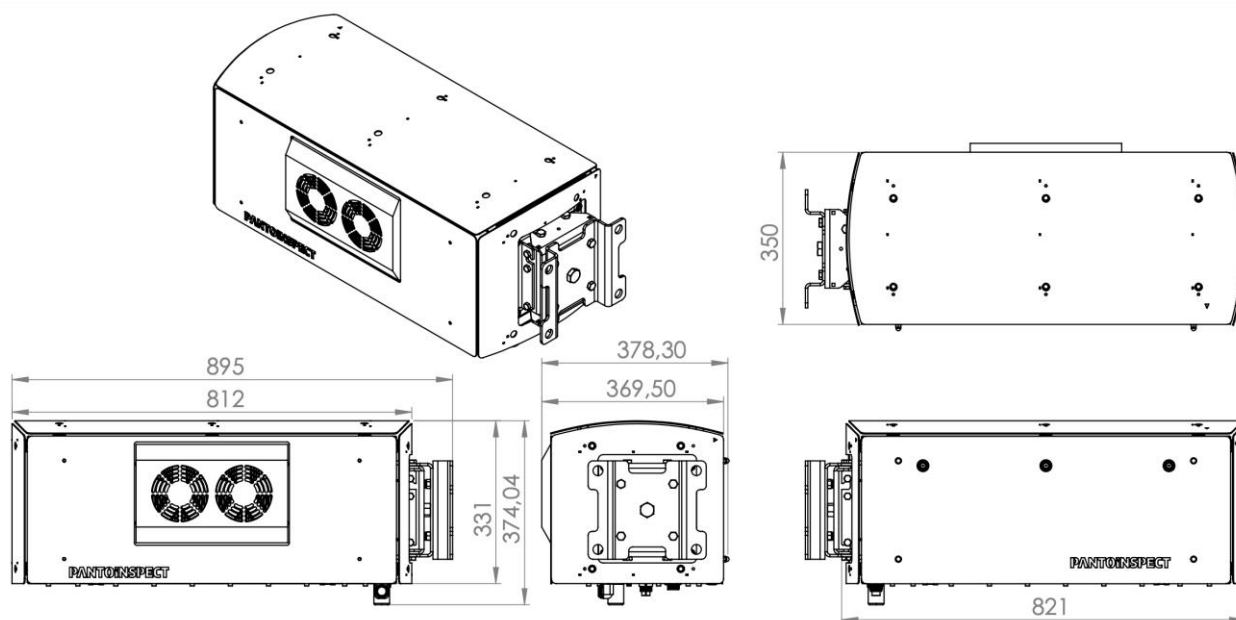
##### ALARMS

Alarm thresholds	Configurable per measurement type, pantograph model and vehicle operator
Alarm levels	Up to three severity levels supported

## INSTALLATION BRACKET


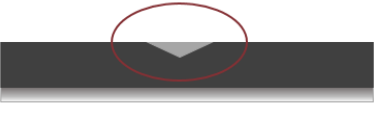

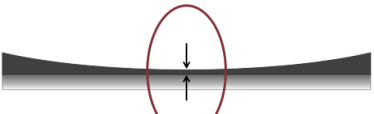




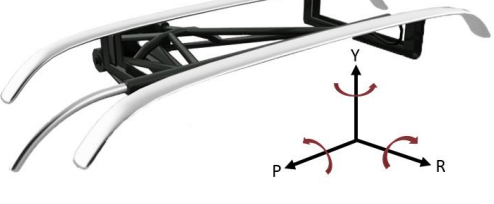


## PANTOSCANNER DIMENSIONS



# PANTOINSPECT

## SYSTEM MEASUREMENTS

	Missing carbon	Resolution 1 mm, accuracy $\pm 2$ mm Standard deviation $< 1$ mm
	Vertical crack	Min. detectable size (W x D): 5 x 3 mm
	Edge chip	Resolution 1 mm, accuracy $\pm 2$ mm Standard deviation $< 1$ mm Min. detectable size (W x D): 5 x 5 mm
	Abnormal wear	Resolution 1 mm, accuracy $\pm 2$ mm Standard deviation $< 1$ mm Min. detectable size (W x H): 5 x 3 mm
	Remaining carbon	Resolution is 1 mm, accuracy $\pm 2$ mm Standard deviation $< 1$ mm
	Asymmetry	Measured as percentage
	Uplift displacement Uplift force	Displacement resolution is 1 mm Force accuracy is based on the wire dynamics
	Horn displacement Missing horn	Horn displacement, angular or distance Horn presence detection
	Roll angle Yaw angle Pitch angle	Angular range from $-6^\circ$ to $+6^\circ$

Note: Accuracy and resolution may vary depending on pantograph type, manufacturing tolerances on new carbon strips, frequency of observations, local conditions, as well as differences in manual measurements for references. For all measurements, it is assumed the carbon strips are still in contact with the contact wire.