MERIDIAN
MEASUREMENT SYSTEMS

PRODUCT DATA SHEET

Remote Detector (RD 1xxx & RD 2xxx)

1Vpp and 11µApp incremental signals have been ubiquitous in measuring devices since the 1980's. The most common are glass scales used in CNC feedback systems for linear and angular measurement. Maintenance of these systems is critical to sustaining machine up-time and peak performance.

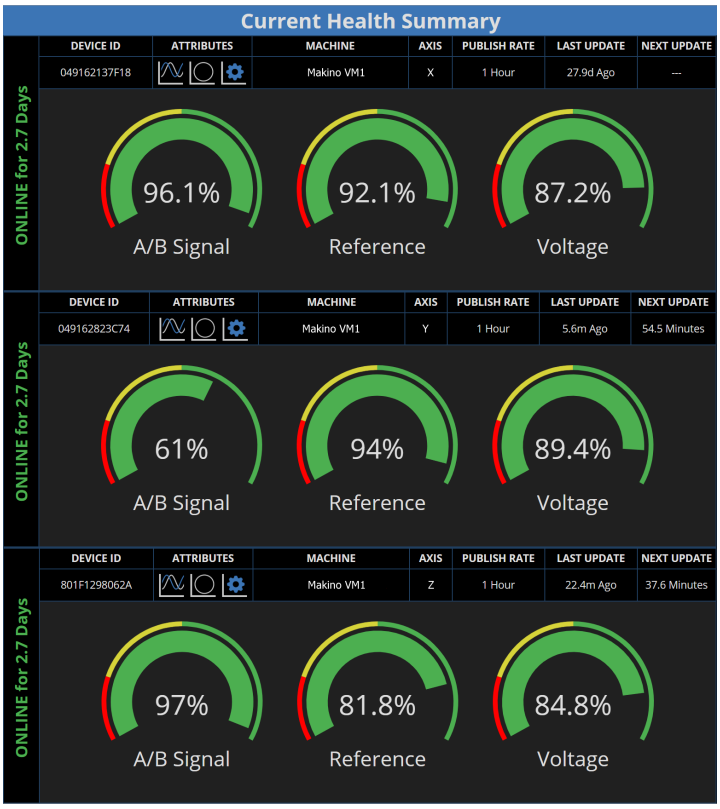
In most cases, the analog signals from these incremental scales can easily be analyzed by a skilled technician using proper equipment. However, in order to access the analog signals, the machine tool must be shut down completely for the specialized test equipment to be plugged in-line. The biggest problem is that technicians often don't get to evaluate equipment until after a failure has occurred. In addition, when a technician is given time to proactively evaluate equipment, they are still limited to collecting data in non-production conditions and only during the snap-shot in time for which they have access to the machine. This process of spot checking feedback signals in order to predict failure is unreliable and it costs valuable production time & money. It is for this reason that the Remote Detector was developed.

- **Predict machine crippling failures**
- **24/7/365 monitoring of scale signals**
- **User customizable warning and fault limits**
- **Real time email and text alerts**
- **Avoid manufacturing process interruptions**
- **Identify noise caused by contaminated power**
- **Capture intermittent signal and power faults**
- **Easy Plug-n-Play installation**
- **Give service technicians remote access to live diagnostic data**

Nowadays, manufacturing businesses rely heavily on their automation, manufacturing and control systems. When it comes to relaying absolutely accurate position signals between feedback devices and the control system, there's no margin for error.

Indeed manufacturing availability of 99.9 percent uptime or better is often the goal. Given this reality, a robust industrial infrastructure consisting of highly intelligent monitoring solutions is essential to long-term performance and reliability.

Maximum productivity with minimal downtime is paramount for achieving production line performance. If a scale, encoder or cabling system in the manufacturing equipment fails, the cost of parts replacement and repair represents only a tiny fraction of the overall costs of production down-time. If a scale or cable component fails in, for instance, a loaded production line, the emergency repair/labor costs alone could be 10-15 times the cost of the component it-self.

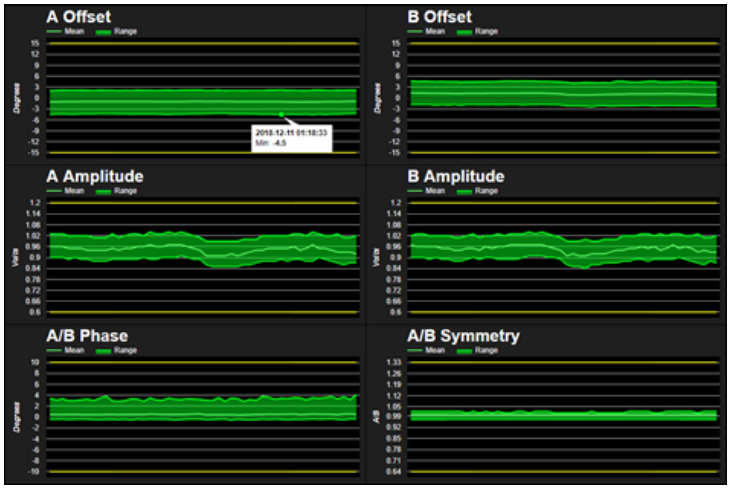


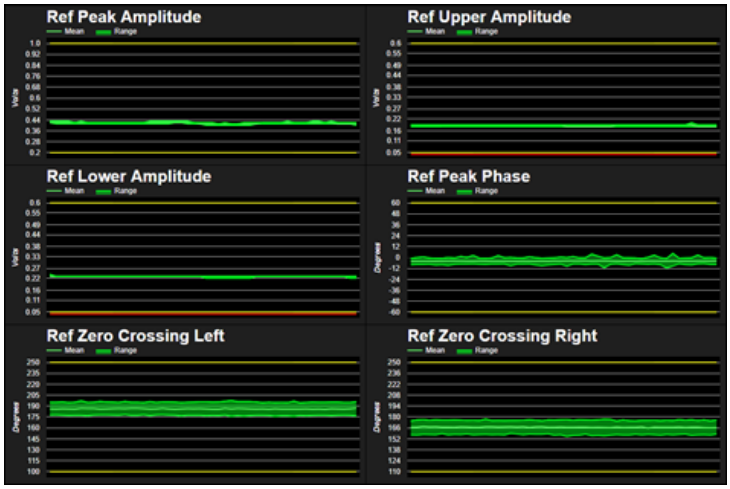
In addition, the indirect costs of system failure in any in-dustry must take into account loss of productivity, delayed downstream processes, cost of system shut-down and start -up, and the potentially devastating loss of service to cus-tomers relying on the plant's mission-critical output.

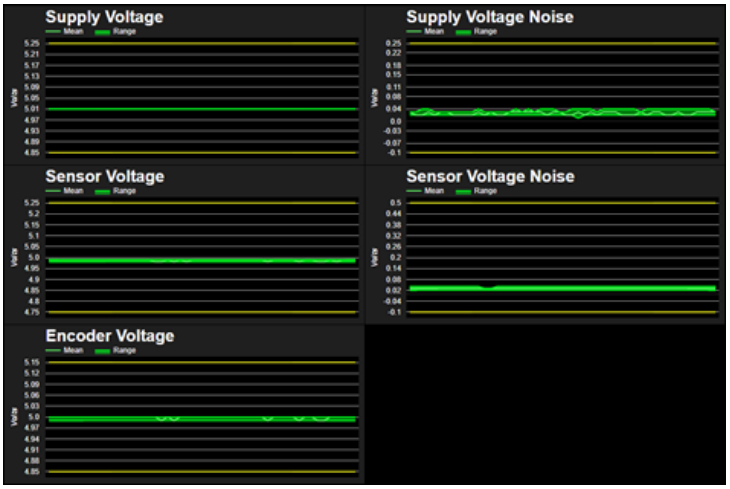
That's why investing in a high-quality; rugged monitoring solutions designed specifically for use in harsh environ-ments is a wise business decision – one that can provide tremendous peace of mind to production managers, maintenance engineers, and the organizations they serve.

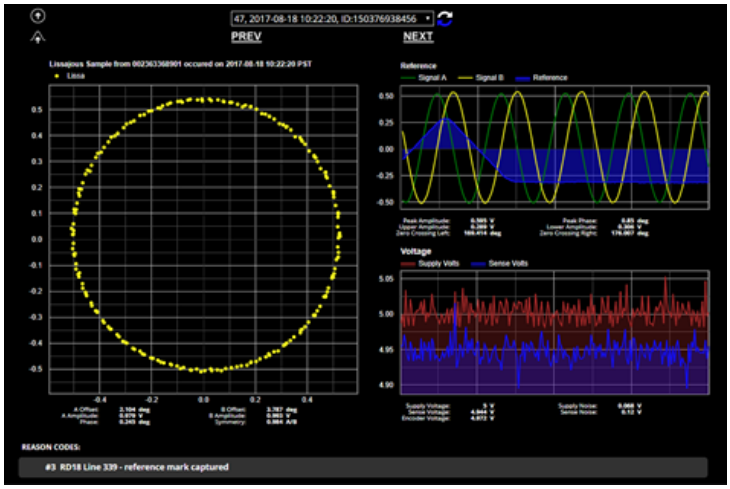
The Remote Detector series of devices are designed to be permanently installed in-line between the incremental scale and the control, allowing for real time analysis of scale conditions. Performance data and event information are transmitted using encrypted TCP/IP protocol over standard Ethernet to the MERIDIAN Cloud Service. Use of a Remote Detector is synonymous with having a trained technician watching your feedback system 24/7/365.

All Remote Detectors include free basic access to the MERIDIAN Cloud Service. Through the MERIDIAN Cloud Service, users can easily view their scale's performance characteristics, customize the Remote Detector's alert settings and much more. Advanced service level access allows for live samples of the scale signals directly to the technician's PC for fast, accurate diagnostics and troubleshooting regardless of their location.









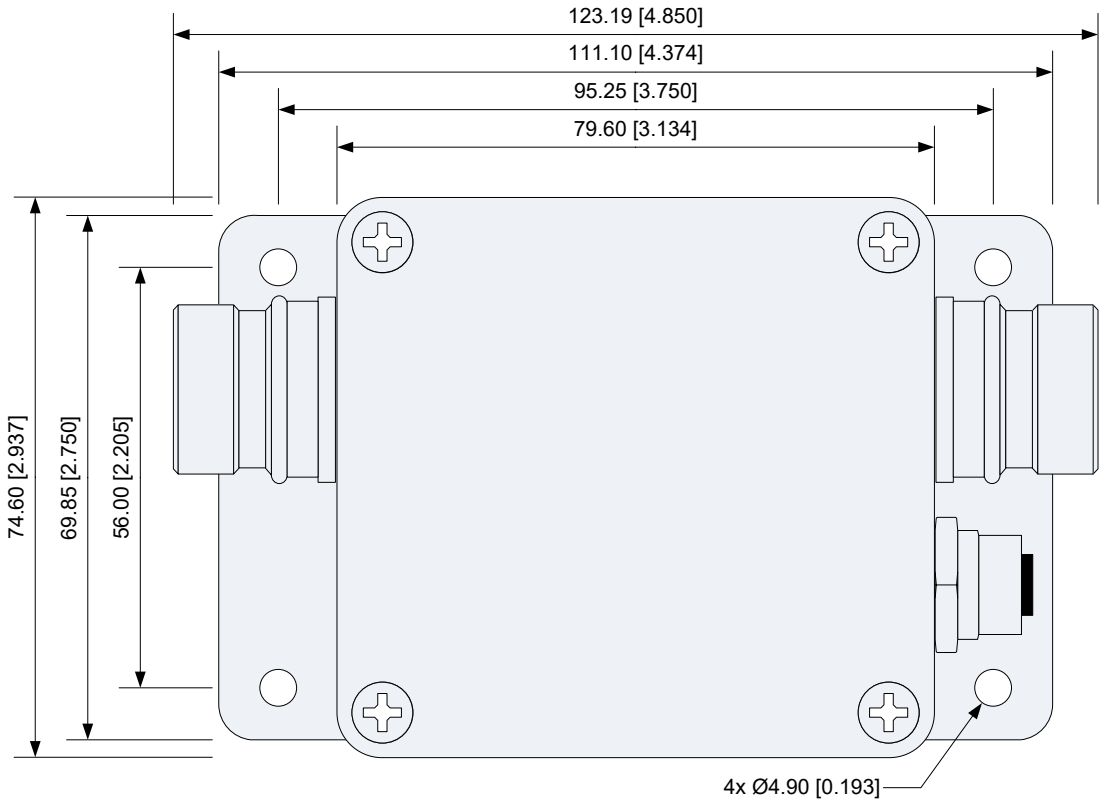
RD 1xxx Technical Specifications

The RD 1xxx series of Remote Detectors are designed for harsh environments. Featuring a sealed die-cast aluminum enclosure and IP 67 rated connectors, these devices can be placed anywhere signal analysis is required. The signal processing circuitry is powered by PoE (Power Over Ethernet), permitting the Remote Detector to draw only a few milliamps from the control system to maintain the passthrough signals as they are not effected by PoE power loss.

PRODUCT	RD 1002	RD 1082	RD 1882	RD 1802
PRODUCT SPECIFICATIONS				
Input Signal	11µApp	11µApp	1Vpp	1Vpp
Output Signal	11µApp	1Vpp	1Vpp	11µApp
ANALYSIS SPECIFICATIONS				
Samples Per Second	20,000			
Frequency Response	≤500KHz		≤700KHz	
Minimum Input Frequency for Successful Waveform Analysis	100Hz			
Range of Amplitude Measurement	±0.5µA — ±16µA		±0.1V — ±1.6V	
Accuracy of Amplitude Measurement	±0.1µA		±0.01V	
Range of Offset Measurement	0° — 180°			
Accuracy of Offset Measurement	±0.1°			
Range of Phase Measurement	0° — 80°			
Accuracy of Phase Measurement	±0.1°			
Accuracy of Reference Pulse Width	±5°			
Accuracy of Reference Pulse Amplitude	±0.1µA		±0.01V	
Accuracy of Reference Pulse Position	±2°			
PHYSICAL SPECIFICATIONS				
Dimensions (W x D x H) *(enclosure only)*	2.94in [74.6mm] x 3.13in [79.6mm] x 2.45in [52.0mm]			
Weight	0.7lb			
IP Rating	IP 65			
POWER SPECIFICATIONS				
Supply from Subsequent Electronics (for analog pass through)	3.9v — 6.5v DC			
Maximum Power Consumption from Subsequent Electronics	45mW		60mW	
Supply from PoE (for internal digital processing)	PoE 802.3at (Power Over Ethernet)			
Maximum Power Consumption from PoE	2.5W		2.5W	
NETWORK SPECIFICATIONS				
IEEE 802.3at PoE (Power over Ethernet)	REQUIRED			
IEEE 802.3u 100BASE-TX Fast Ethernet	AUTOSENSING			
IEEE 802.3i 10BASE-T Ethernet	AUTOSENSING			
Data Encryption	128bit AES			
IP Configuration	DHCP or Static			
CONNECTIONS				
Input	M23 9pin Female		M23 12pin Female	
Output	M23 9pin Male	M23 12pin Male	M23 12pin Male	M23 9pin Male
Ethernet	M12 4pin Female			

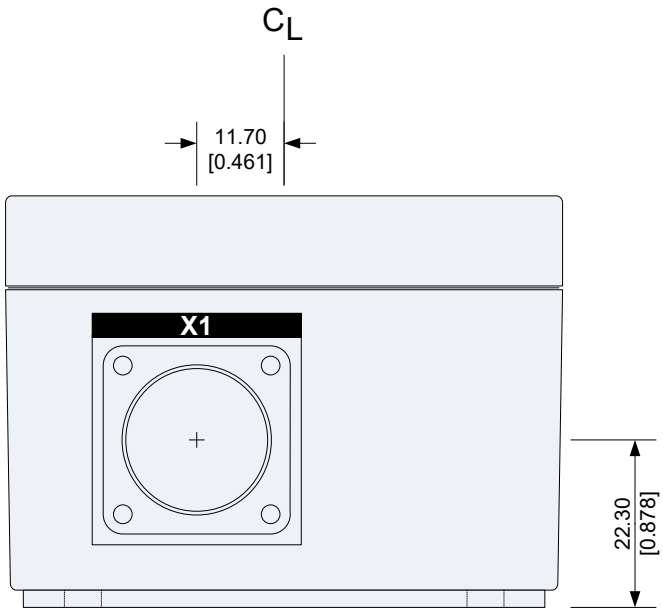
RD 1xxx Dimensions

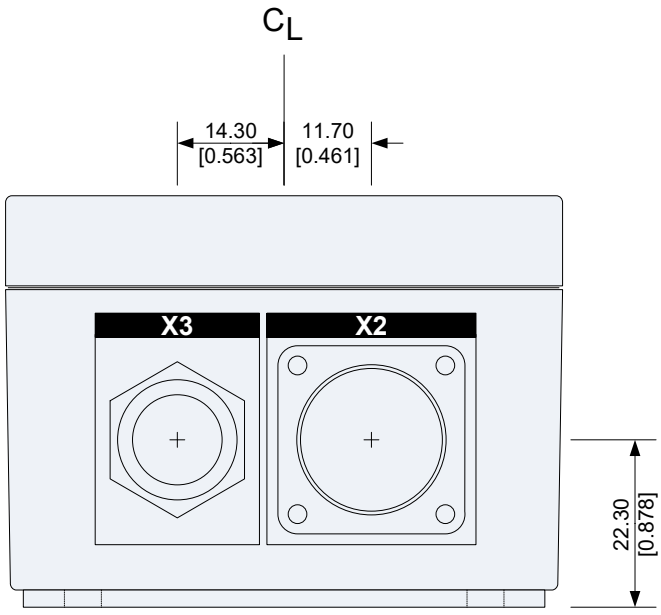
All dimensions are in mm [in].



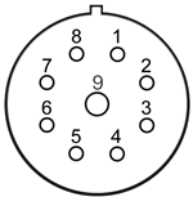
RD 1xxx Dimensions

All dimensions are in mm [in].



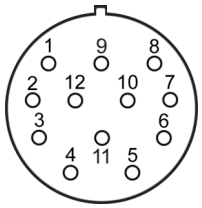


RD 1xxx Electrical Connections



M23 (11µApp)

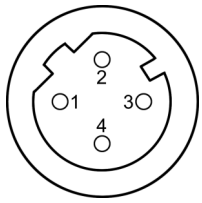
1	2	3	4	5	6	7	8	9
A+	A-	5V	0V	B+	B-	R+	R-	Internal Shield



M23 (1Vpp)

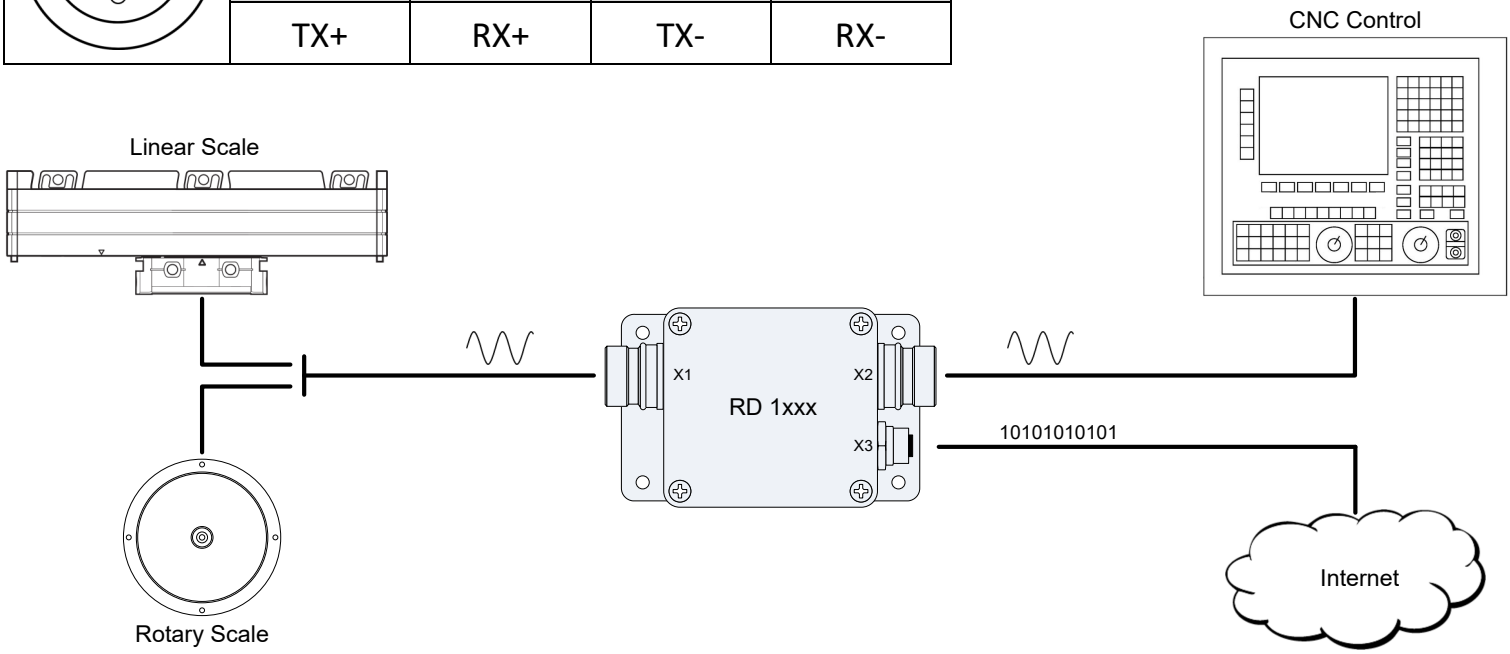
1	2	3	4	5	6	7	8	9	10	11	12
B-	5V Sensor	R+	R-	A+	A-	*	B+	*	0V	0V Sensor	5V

* = Pass Through from Input to Output



M12 (Ethernet)

1	2	3	4
TX+	RX+	TX-	RX-



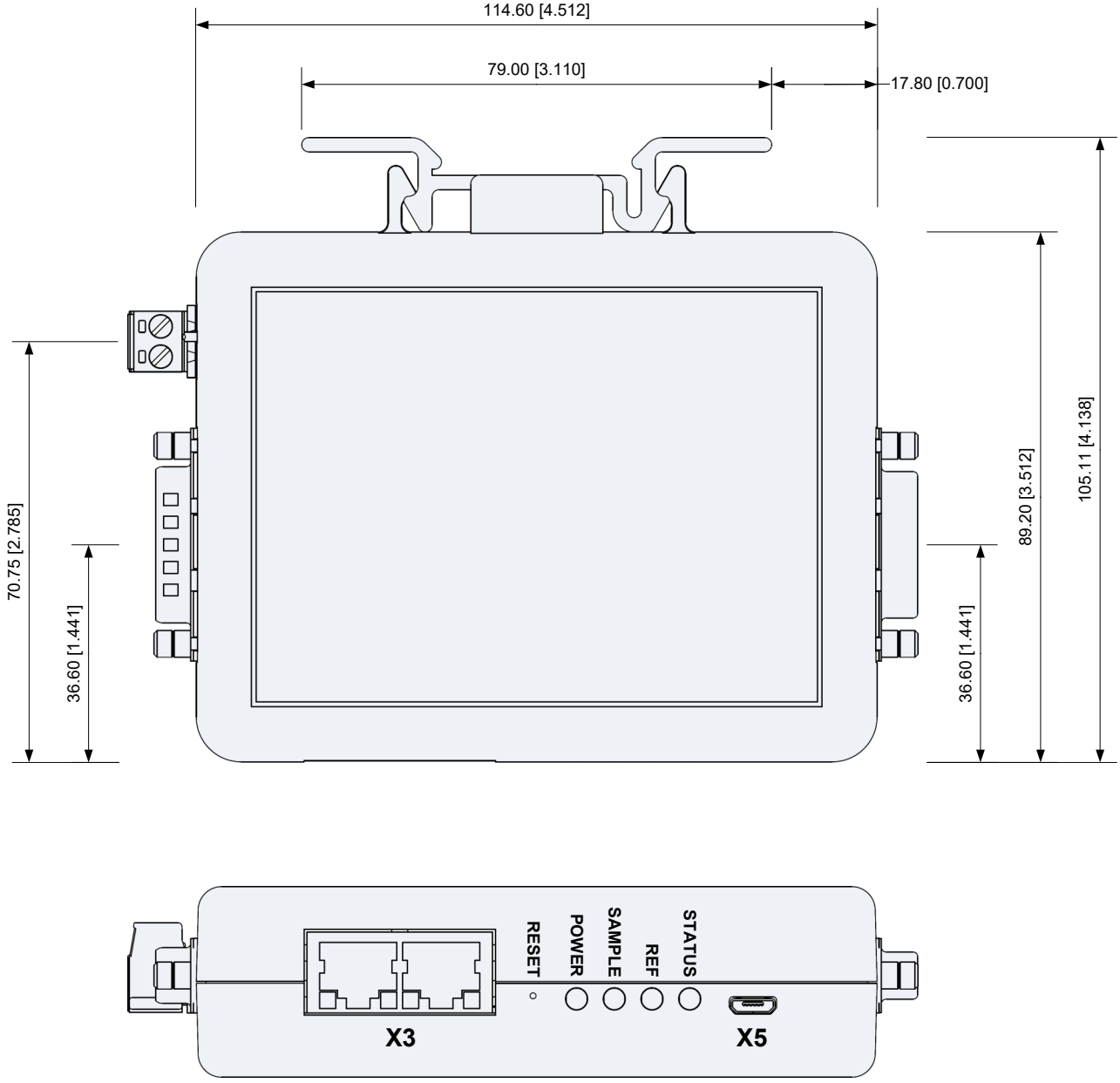
RD 2xxx Technical Specifications

The RD 2xxx series of Remote Detectors are designed to be DIN rail mounted inside the control cabinet. These devices feature a built in 2 position ethernet switch for easy network connectivity without the need for a separate multi-port switch. Multi-color status LEDs provide easy identification of signal conditions. The signal processing and passthrough circuitry are both powered by the 12—60VDC supply, therefore system power is required in order to maintain the passthrough signals.

PRODUCT	RD 2002	RD 2082	RD 2882	RD 2802
PRODUCT SPECIFICATIONS				
Input Signal	11µApp	11µApp	1Vpp	1Vpp
Output Signal	11µApp	1Vpp	1Vpp	11µApp
ANALYSIS SPECIFICATIONS				
Samples Per Second	20,000			
Frequency Response	≤500KHz		≤700KHz	
Minimum Input Frequency for Successful Waveform Analysis	100Hz			
Range of Amplitude Measurement	±0.5µA — ±16µA		±0.1V — ±1.6V	
Accuracy of Amplitude Measurement	±0.1µA		±0.01V	
Range of Offset Measurement	0° — 180°			
Accuracy of Offset Measurement	±0.1°			
Range of Phase Measurement	0° — 80°			
Accuracy of Phase Measurement	±0.1°			
Accuracy of Reference Pulse Width	±5°			
Accuracy of Reference Pulse Amplitude	±0.1µA		±0.01V	
Accuracy of Reference Pulse Position	±2°			
PHYSICAL SPECIFICATIONS				
Dimensions (W x D x H)	2.94in [74.6mm] x 3.13in [79.6mm] x 2.45in [52.0mm]			
Weight	0.7lb			
IP Rating	IP 30			
POWER SPECIFICATIONS				
Power Consumption from Subsequent Electronics	0w			
Supply from DC power connector (for internal digital processing)	12v—60v DC			
Maximum Power Consumption from DC Supply	4.5w			
NETWORK SPECIFICATIONS				
IEEE 802.3u 100BASE-TX Fast Ethernet	AUTOSENSING			
IEEE 802.3i 10BASE-T Ethernet	AUTOSENSING			
Data Encryption	128bit AES			
IP Configuration	DHCP or Static			
CONNECTIONS				
Input	M23 9pin Female		M23 12pin Female	
Output	M23 9pin Male	M23 12pin Male	M23 12pin Male	M23 9pin Male
Ethernet	RJ45			

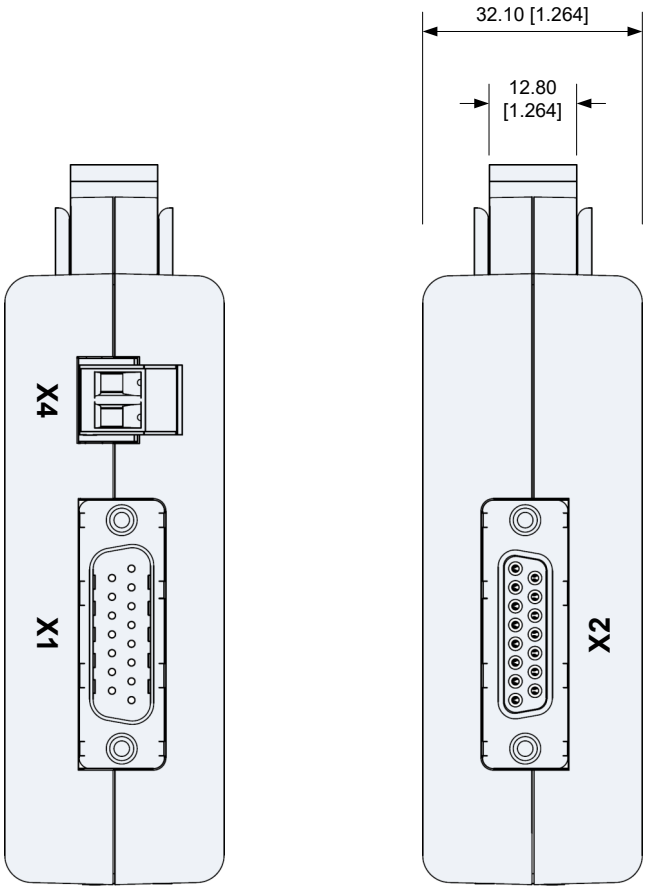
RD 2xxx Dimensions

All dimensions are in mm [in].



RD 2xxx Dimensions

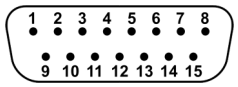
All dimensions are in mm [in].



RD 2xxx Electrical Connections

D15 Male (11µApp / 1Vpp)

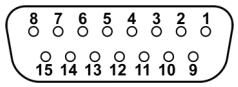
(Input from measuring device)



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11µApp	5V Supply	0V Supply	A+	A-	∞	B+	B-	∞	∞	R+	∞	R-	∞	∞	∞
1Vpp	5V Supply	0V Supply	A+	A-	∞	B+	B-	∞	5V Sense	R+	0V Sense	R-	∞	∞	∞

D15 Female (11µApp / 1Vpp)

(Input from measuring device)



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11µApp	5V Supply	0V Supply	A+	A-	∞	B+	B-	∞	∞	R+	∞	R-	∞	∞	∞
1Vpp	5V Supply	0V Supply	A+	A-	∞	B+	B-	∞	5V Sense	R+	0V Sense	R-	∞	∞	∞

∞ = Passthrough