

## AN001: Wiegand Compatibility

The Wiegand protocol was first introduced in the 1980s by John Wiegand and is commonly used in access control systems globally today. While Third Millennium does recommend transitioning to a more modern protocol with additional reporting and monitoring capabilities such as OSDP in some instances this may not be possible due to legacy controllers or older generations of reader hardware. The Wiegand interface for access control was presented by the SIA in 1996 but a few interpretations of this standard exist on the market today.

Third Millennium readers hold the data lines at +V until a data stream is transmitted, an example of the circuit used may be seen in *Figure 1* below. Holding the data lines at this high voltage increases their resistance to external noise factors, as well as boosting signal integrity over a long distance where the voltage may drop due to the cable distances involved.

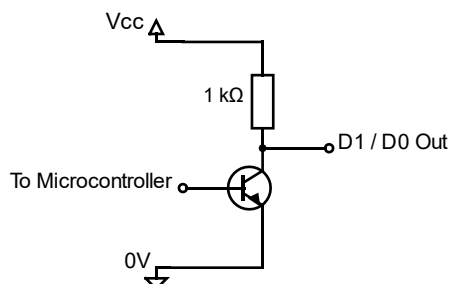


Figure 1: Wiegand output circuit

Some ACU's are not compatible with this high voltage steady state and require the voltage to be limited to around +5V to ensure correct operation. In order to achieve this the voltage may be limited where the reader connects to the access controller by the use of two 5.1V Zener diodes, recommended part numbers are 1N5231B-TP or 1N4733A; availability may vary by region, please contact Third Millennium if additional advice is required. A diode should be fitted from each data line to the 0V terminal, taking care to note the correct orientation as shown below. Any other signal wires may be connected as normal if required.

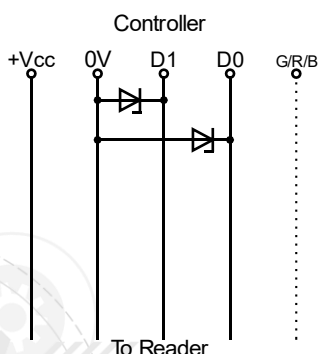


Figure 2: Zener diode fitment

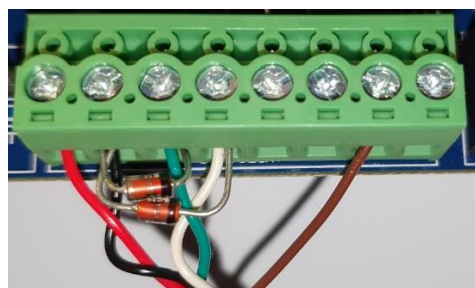


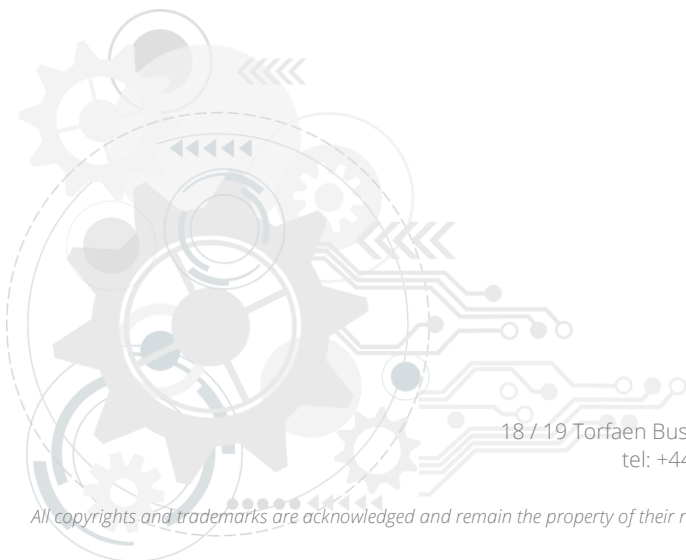
Figure 3: Example installation

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## Appendix 1: Known Incompatibility

Manufacturer	Model	Comments
Brivo	ACS6100	Rev 1 & Rev 2 tested working with diodes fitted. ACS6000 main board functioning without diodes.
Tyco	iSTAR Ultra G2	Apparent when more than two readers are connected to the same ACM. Tested working with diodes fitted.



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