

Reader Noise and HID[®] Mercury[™] Wiegand Behaviour

Technical Bulletin

PLT-06868, A.0
December 2022



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Contacts

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What's new

Date	Description	Revision
December 2022	Initial release.	A.0

A complete list of revisions is available in [Revision history](#).

1.1 Scope

A combination of readers and cables connected to Wiegand inputs on certain HID Mercury LP1501 controllers can result in invalid card reads. This technical bulletin documents the details of this system failure and potential in-field workarounds.

1.2 Issue

Readers and cables producing a substantial negative voltage output, in certain instances, are causing invalid card reads on certain LP1501 controllers.

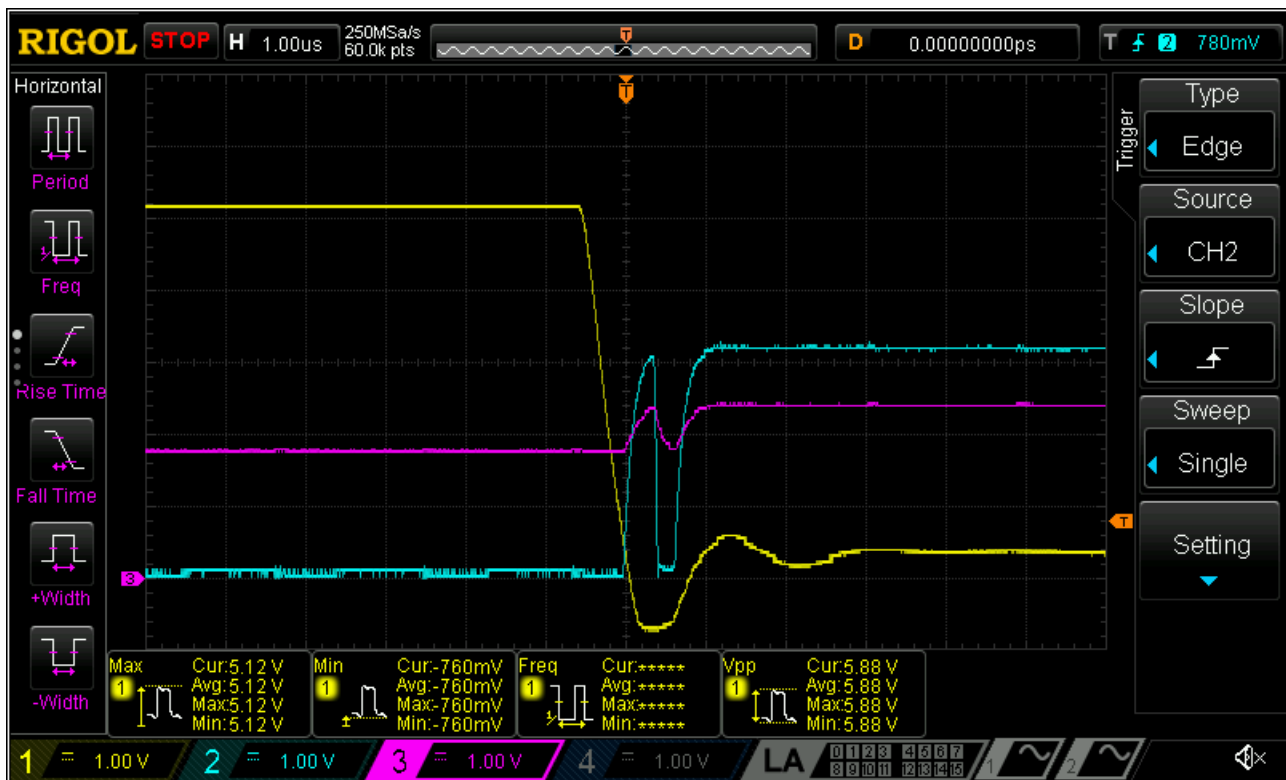
1.2.1 Readers producing the issue

After testing with a variety of readers and cables across all HID Mercury controller models, the issue was observed on the following readers when connected over Wiegand wire runs of roughly 30m and greater:

- Schlage MT15
- Schlage MTK15
- Morpho Sigma WR

The variability of this issue is influenced by a combination of factors such as the speed of Wiegand switching by the readers, cable type/length, and some variability in the detection circuit of the LP1501. In the below image, the reader output (yellow) drops well below 0V causing a toggling of card data (blue line goes up, then down, then up) which the controller picks up as extra card data.

Figure 1. Schlage MT15 with negative voltage output



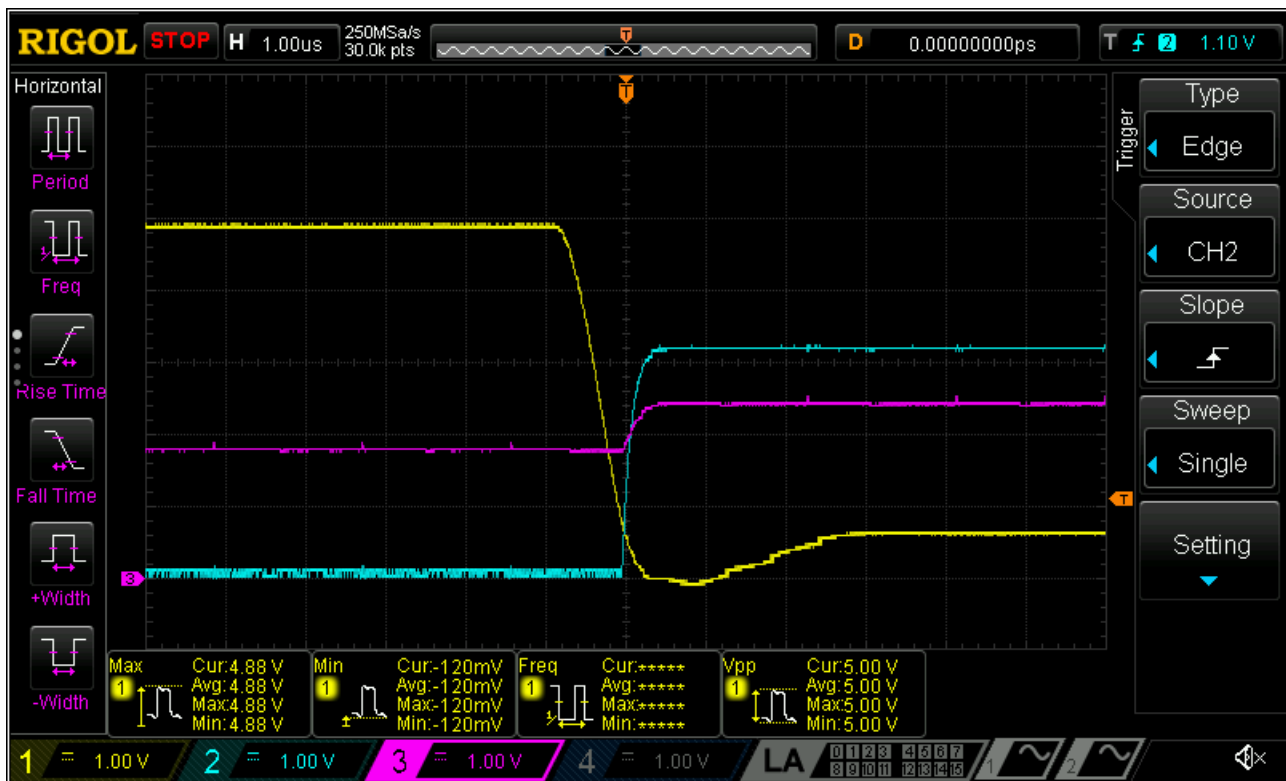
1.2.2 Readers not producing the issue

After testing with a variety of readers and cables across all HID Mercury controller models, **no** issue was observed on the following readers when connected over Wiegand wire runs of roughly 30m and greater:

- HID Signo™
- HID iCLASS SE®
- Schlage PR10
- Schlage MRKB15
- Wavelynx ET20

In the below image, the HID Signo reader Wiegand output (yellow line) does not drop below 0V, and does not cause toggling of card data (blue line goes high only once).

Figure 2. HID Signo reader with proper voltage output



1.3 In-field workarounds

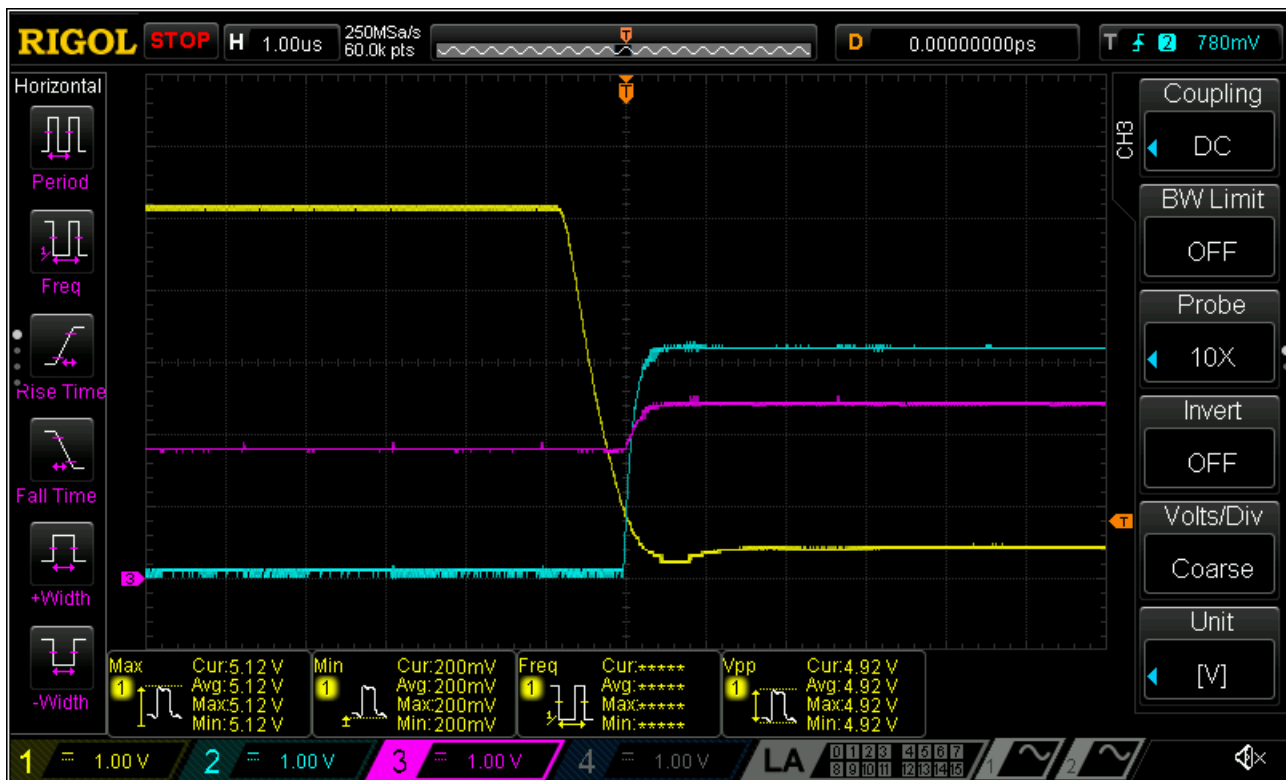
The following in-field workarounds may mitigate the observed issue.

1.3.1 Add series resistance

Add series resistors (suggested starting value of 50 ohms) to both D0 and D1 Wiegand data lines at the reader end. The added resistance slows the falling edge pulse transition and reduces transmission line effects.

In the below image, the 50 ohm resistors are installed in series at the reader end of the same Schlage MT15 reader from [Figure 1](#). This resistance keeps the reader output voltage from dropping below 0V.

Figure 3. Schlage MT15 with series resistance added



1.3.2 Change communication to RS-485/OSDP

Reconfigure and rewire readers and controllers from Wiegand to RS-485/OSDP communication.

1.3.3 Reduce Wiegand pulse length

In cases with the impacted Schlage readers, the issue was mitigated by changing the Wiegand pulse from 100us with 1 ms separation to 40us and 2ms separation via a config card. When experiencing this issue with a non-Schlage reader consult the reader manufacturer for more information on how to alter the reader's Wiegand pulse settings.

Revision history

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