

WDGN Series Encoder

NFC Configuration Guide

How to set up and configure your Wachendorff WDGn incremental encoder using the WDGn-CONFIG-TOOL software and the NFCUSBREADER

Before You Begin

Your WDGN series encoder is configured wirelessly over NFC (Near Field Communication). There are two ways to do it — choose the one that suits you.

Option 1 — PC software (used throughout this guide)

- Download and install the WDGN-CONFIG-TOOL from Automation Direct.
- The software requires a USB-compatible NFC reader. Order part number NFCUSBREADER from AutomationDirect.

Option 2 — Mobile app

- Scan the QR code below that applies to your phone to install the app.

The examples in this guide use a WDGN 36A-2Z-XX-BAS-SC8. The BAS output circuit designator enables or disables certain functions in the software that pertain to the BAS circuit option only. Encoders with a different output designator may offer different options.



**iOS
Download**

Note:

Free smartphone app available for NFC communication. Scan the iOS or Android QR code to install.



**Android
Download**

Step 1 — Connect the Encoder

Follow these steps to connect your encoder to the software.

1. Install and open the WDGN-CONFIG-TOOL software.
2. Plug the NFCUSBREADER into a USB port on your PC.
3. Make sure the encoder is powered off. It must remain unpowered during configuration.
4. Place the encoder flat on the USB reader, as shown below.

The software recognizes the encoder automatically, reads its current configuration, and populates the relative values in the screen.



Channel	PPR channel	Duty cycle channel	Phase offset channel
Channel 1	☒ Off/on	1024	0.5
Channel 2	☒ Off/on	1024	0.5
Channel 3	☒ Off/on	1	0.25
Channel 4	☐ Off/on	0	0

Step 2 — Set the Resolution (PPR)

Pulses per revolution (PPR) sets how many output pulses the encoder produces for one full turn of the shaft.

- Set the PPR to any whole number from 1 to 16,384.
- The value you enter for Channel 1 is applied automatically to Channel 2.
- Channel 3 cannot be adjusted. It is the index pulse, also called the Z pulse or N (null) pulse.
- Duty cycle and phase offset are fixed and cannot be changed.

The screenshot shows a web-based configuration interface for a WACHENDORFF encoder. At the top, there are five tabs: 'Configuration' (selected), 'Firmware update', 'DynamicData', 'Help', and 'Upgrade'. Below the tabs, the interface is organized into four rows, one for each channel. Each row contains a 'Channel' label with a checkbox for 'Off/on', a 'PPR' label followed by a text input field, a 'Duty cycle' label followed by a text input field, and a 'Phase offset' label followed by a text input field. Channel 1 has a checked 'Off/on' box, a PPR of 1024 (with up/down arrows), a duty cycle of 0.5, and a phase offset of 270. Channel 2 has a checked 'Off/on' box, a PPR of 1024, a duty cycle of 0.5, and a phase offset of 0. Channel 3 has a checked 'Off/on' box, a PPR of 1, a duty cycle of 0.25, and a phase offset of 0. Channel 4 has an unchecked 'Off/on' box, a PPR of 0, a duty cycle of 0, and a phase offset of 0.

Channel	PPR channel	Duty cycle channel	Phase offset channel
Channel 1 ☒ Off/on	1024	0.5	270
Channel 2 ☒ Off/on	1024	0.5	0
Channel 3 ☒ Off/on	1	0.25	0
Channel 4 ☐ Off/on	0	0	0

Remember: changes you make on screen are not stored in the encoder until you click Set config.

Step 3 — Configure the Output

Pre-configuration

Line driver

Direction

☐ Set zero

IO function

Output channels
☒ ABN
AB
A

Output voltage
TTL
☒ HTL

Rotation direction
☒ CW
CCW

Output channels

- Selecting AB removes the index pulse channel — the N and /N signal wires will have no output.
- Selecting A removes both the B channel and the index pulse — the B, /B, N and /N signal wires will have no output.

Output voltage

- TTL: the encoder accepts any input voltage from 5 V to 32 V and the output signal is always 5 V.
- HTL: the encoder accepts any input voltage from 5 V to 32 V and the output signal mirrors the input voltage.

Rotation direction

- CW and CCW change which channel leads in the quadrature output — A leads B, or B leads A.

Note: the “Set zero” and “IO function” settings have no effect on WDG N BAS encoders.

Remember: click Set config to write these settings to the encoder. The encoder must stay powered off and still while the configuration is written.

Checking Rotation Direction

The traces at right were captured from the same encoder rotated clockwise with 12 V applied, first configured CW and then CCW. Channel 2 (blue) is phase A and channel 3 (red) is phase B.

Top trace settings — ABN / HTL / CW

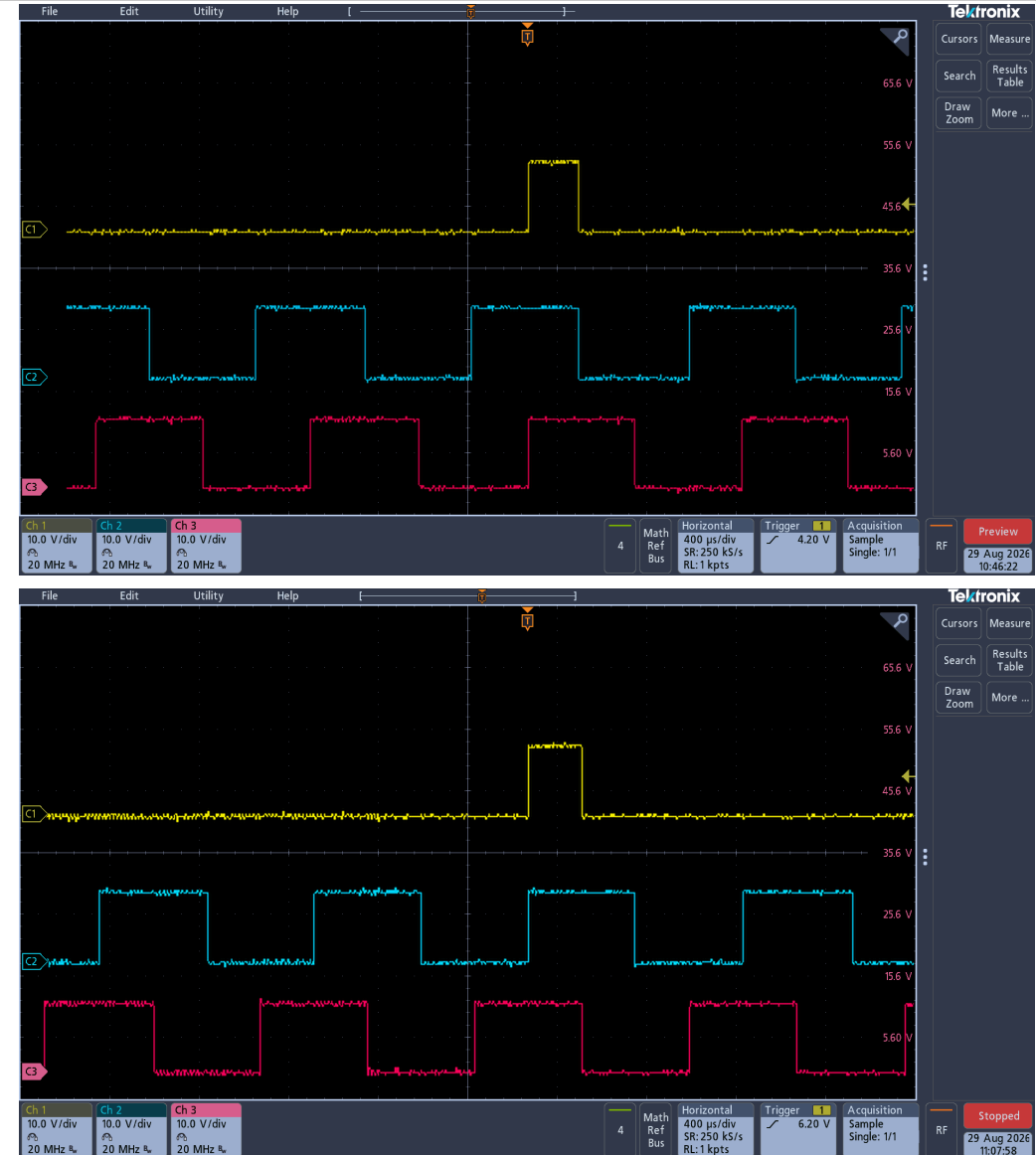
- Phase A leads phase B when the encoder is rotated clockwise.

Bottom trace settings — ABN / HTL / CCW

- Phase B now leads phase A when the encoder is rotated clockwise. Rotating counter-clockwise gives A leading B again.

Index pulse

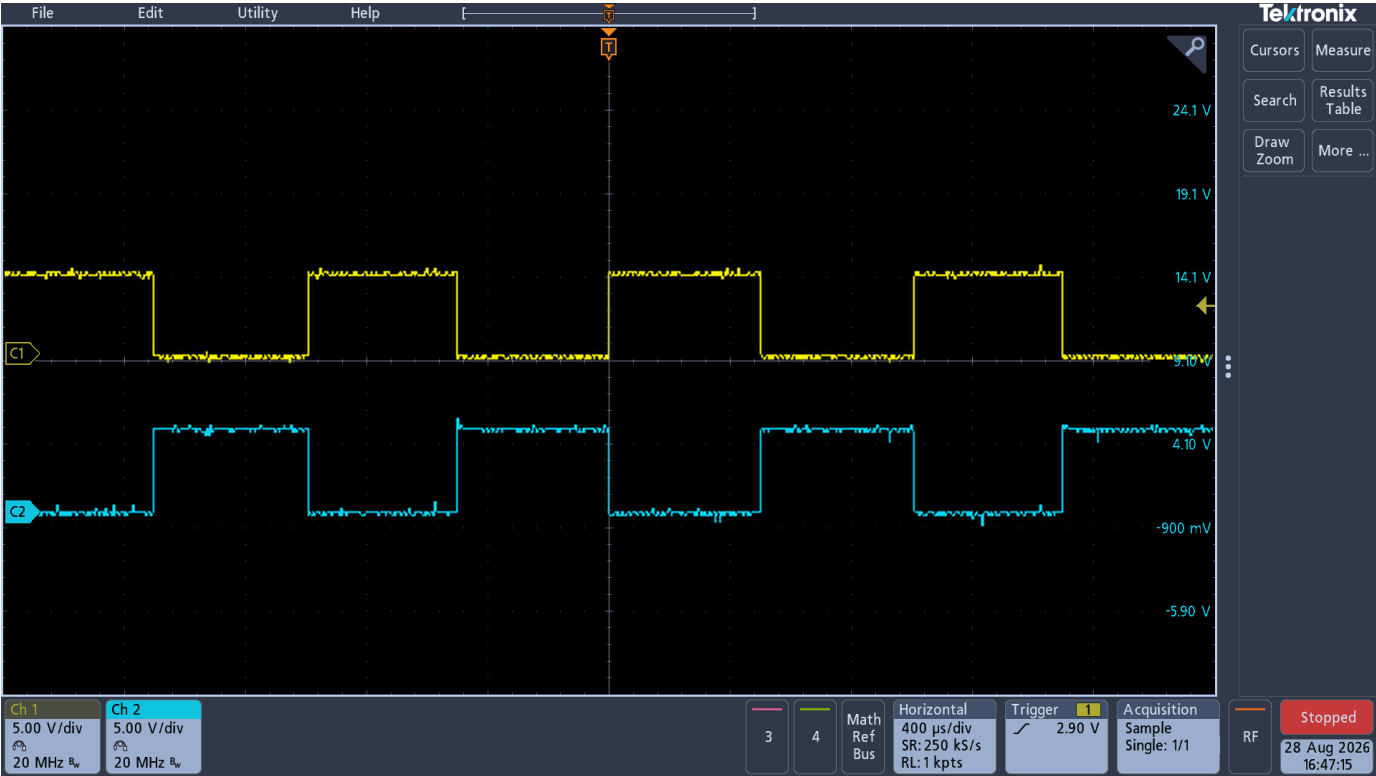
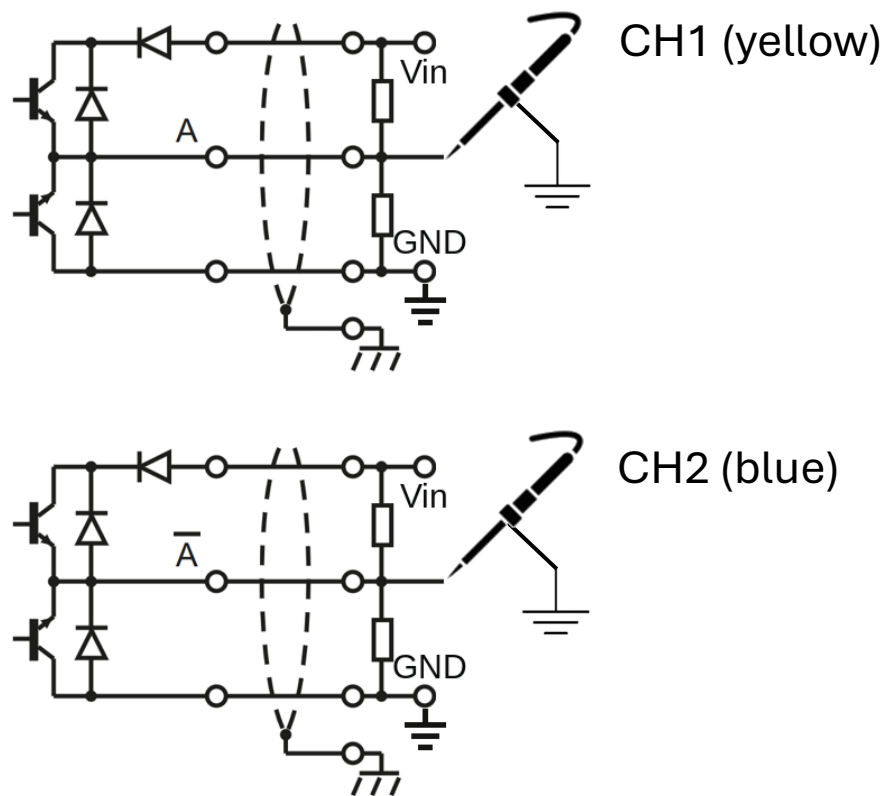
- Channel 1 (yellow) is the index (N) pulse. Its width is always 25% of the duty cycle, and it occurs where both A and B are high.



HTL Output Signals

In an HTL configuration the output signals (A, B, N and /A, /B, /N) follow the input voltage applied at Vin. If Vin is 5 V, 12 V or 24 V, the outputs pulse from 0 V up to Vin.

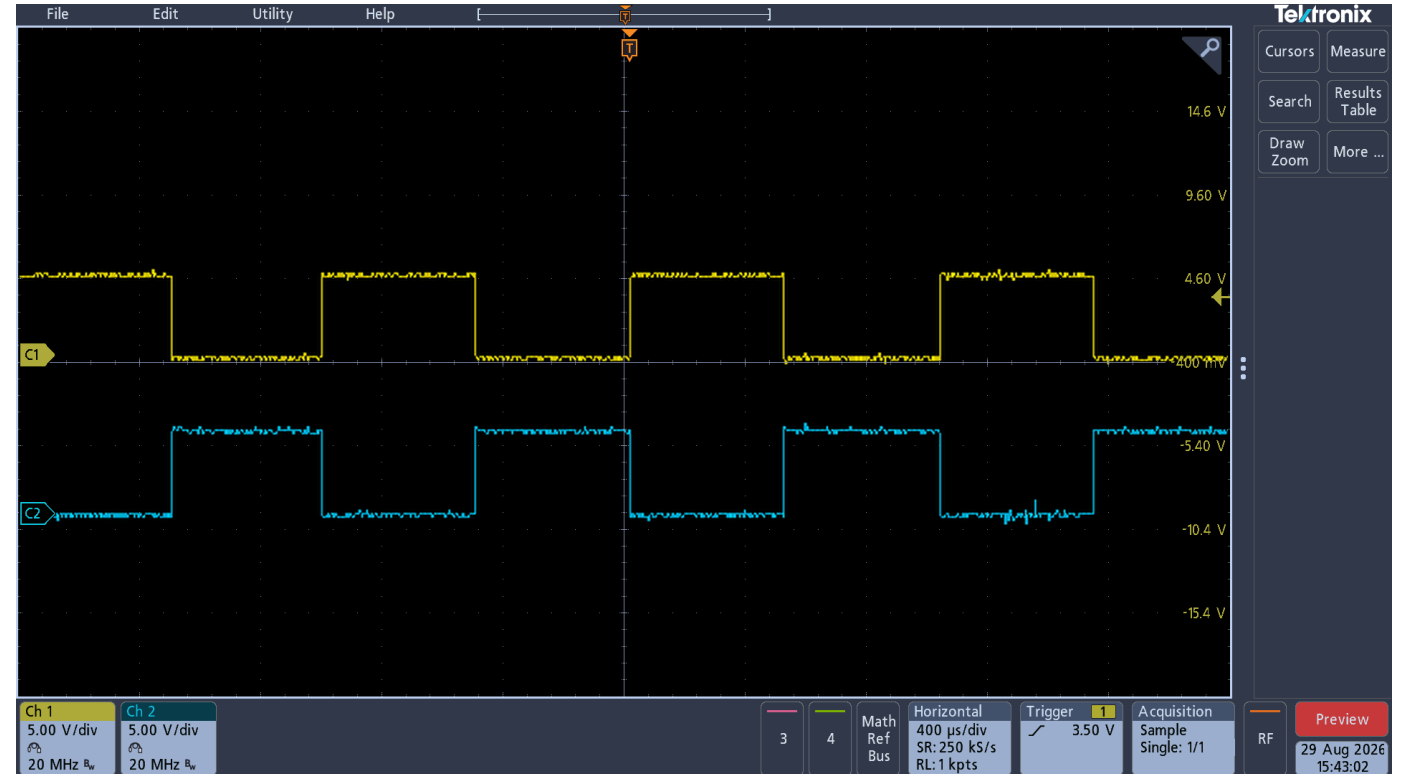
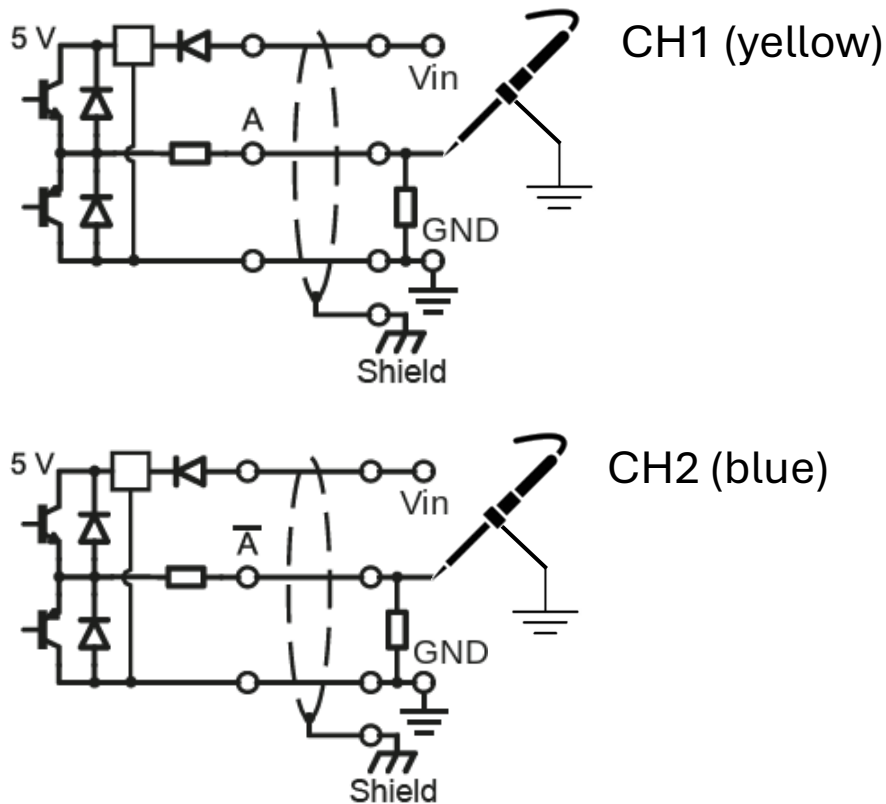
The example below shows A and /A on two oscilloscope channels. Both are 0–12 V pulses because the input is 12 V, so the maximum difference between them is 12 V. The complementary channels (/A, /B, /N) never go negative — they are also 0–12 V signals, simply inverted with respect to A, B and N.



TTL Output Signals

In a TTL configuration the output signals (A, B, N and /A, /B, /N) will always output at a 5 V level regardless of the input voltage. If V_{in} is 5 V, 12 V or 24 V, the outputs always pulse from 0 V to 5 V

The example below shows A and /A on two oscilloscope channels. Both are 0–5 V pulses even though the input is 12 V. The complementary channels (/A, /B, /N) never go negative — they are always 5 V signals, simply inverted with respect to A, B and N.



Reading and Writing the Configuration

When the encoder connects to the software its configuration is read automatically. You can re-read it at any time by clicking Get config and write your changes to the encoder by clicking Set config.

Protecting the encoder with a PIN

- If a PIN is stored in the encoder, the configuration can still be read but cannot be changed until the correct PIN is entered.
- To unlock the encoder, type the PIN in the PIN/PUK field and press Enter.
- To set a new PIN, type it in the New PIN field and click Set config to write it to the encoder.
- Encoders do not have PIN set from the factory.

Customer data

- You can store up to 128 characters of your own text in the Customer data field. It is saved inside the encoder.

Connect NFC reader

NFC reader

Identiv uTrust 3700 F CL Reader

NFC tag detected

File export

File import

File path

C:\Users\jmoulton\OneDrive - Automationdirect.com Inc\Documents\LabVIEW Data\Encoder-ConfigFiles\

...

Reset error

▲

▼

PIN/PUK

PIN

New PIN

Quit

Eingabe PIN/PUK;
Enter PIN or PUK to unlock;

WDGN config tool (1.7.5.1) (c) W

Get config

Set config

Customer data

Clear

Characters available

97

Status Messages — PIN-Locked Encoder

The status window along the bottom of the software reports what the encoder is doing and flags any problems.

The example below shows error code 9212. This appears when the encoder is locked with a PIN. Enter the correct PIN in the PIN/PUK field and press Enter to unlock the encoder before writing a new configuration.

Status window reporting error code 9212 on a PIN-locked encoder

status



code

d9212

source

ChckPinFormat.vi<ERR>
Invalid input parameter: Value range violated; Pin length: 0; required: 4

Complete call chain:
ChckPinFormat.vi
CalcPinHash.vi
main_NFC_encoder_config.vi @ ChckPin @ GetStatus @ GetStatus @ GetStatus @ GetStatus @ GetStatus @
GetStatus @ GetStatus @ GetStatus @ GetStatus

Connect NFC reader

NFC reader

Identiv uTrust 3700 F CL Reader

 NFC tag detected

File export

File path

C:\Users\jmoulton\OneDrive - Automationdirect.com Inc\Documents\LabVIEW Data\Encoder-ConfigFiles\

File import

PIN/PUK

New PIN

Quit

Reset error

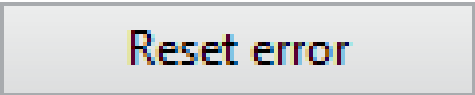
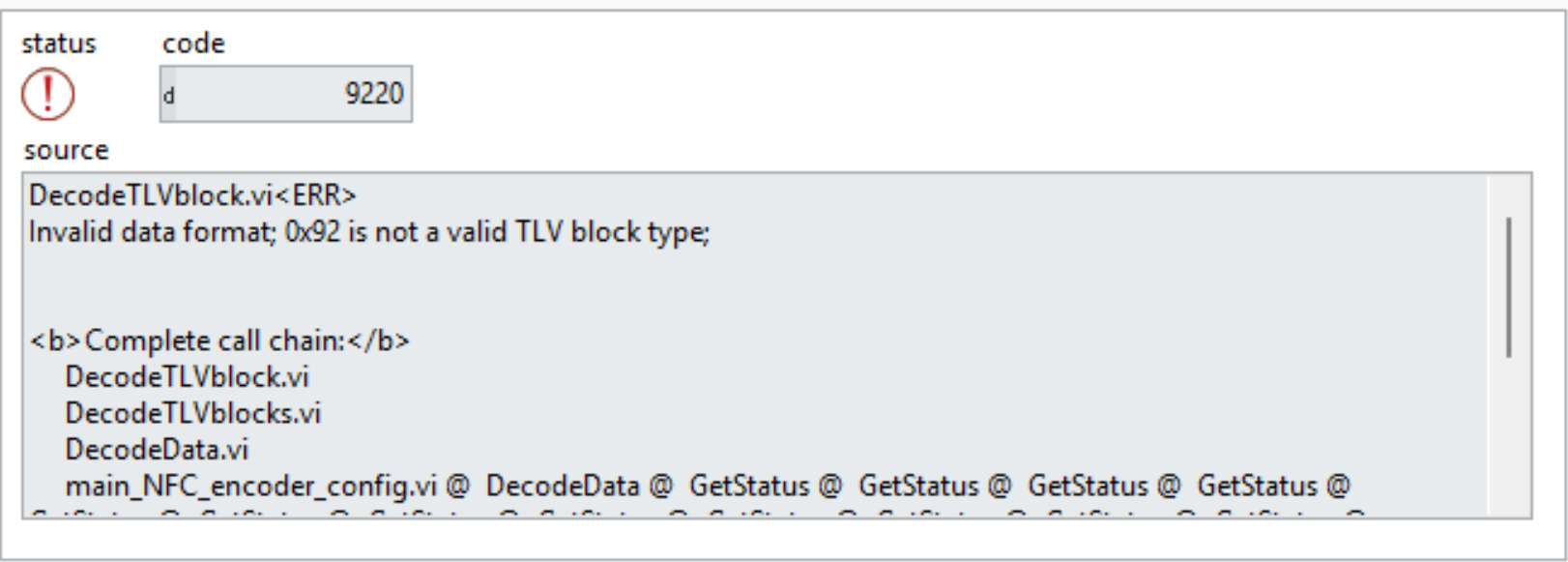
PIN

WDGN config tool (1.7.5.1) (c) WA 2024

Remember: a PIN-locked encoder can still be read — only writing the configuration is blocked.

Clearing Errors

If the encoder returns invalid data, reports another error, or cannot decode data, click Reset error to clear the fault. Some errors can only be cleared by removing power from the encoder and re-applying it.



The Reset error button

Still stuck? If an error persists after both a reset and a power cycle, contact AutomationDirect technical support.