



Protocol Guide – Evaluation Kit



2025 - 2026

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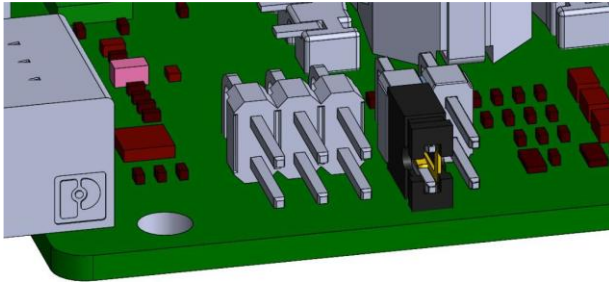
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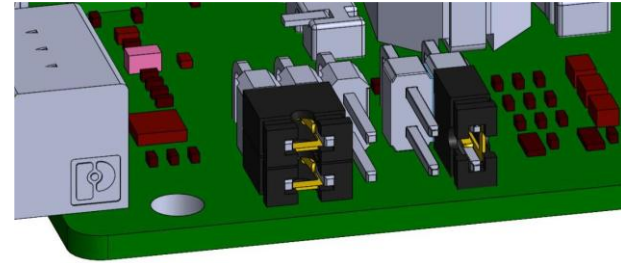
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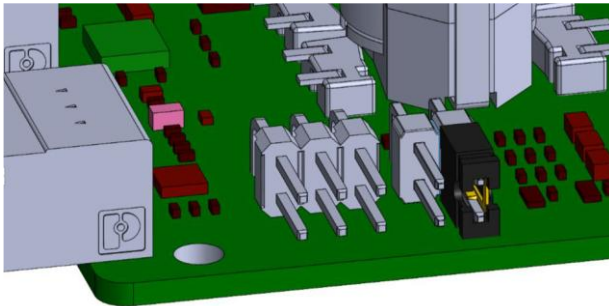
Bus CAN communication



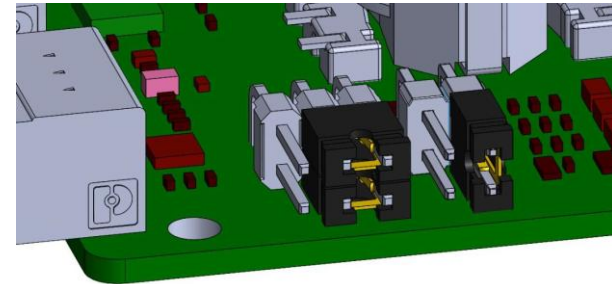
USB communication



UART communication

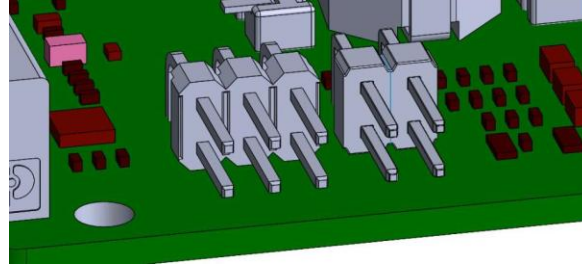


RS232 communication



1. Jumper Configurations

GPIO + PWM



GPIO control :

Speed control is achieved via PWM by modifying the duty cycle.
 The signal must have an amplitude of 3.3V, with a frequency $\geq 10\text{kHz}$.

Connector J9 of ECU		
PWM_IN : Pin 3	100% Duty Cycle : Max speed	0% Duty Cycle : Motor stopped
START/STOP : Pin 2	Low State (0V) : Motor Start	High State (3,3V) : Motor Stopped
CW/CCW : Pin 1	Low State (0V) : CCW	High State (3,3V) : CW

2. Message Format

Communication is handled via UART, USB, or CAN, using exactly the same structure.

General structure of a frame sent to the board :

```
$<Command><Data><LF>
```

- **\$** : Start character
- **<Command>** : Instruction
- **<Data>** : Optional parameters
- **<LF>** : End of frame (0x0A)



On the HMI, the <LF> character is not required. It's appended automatically when clicking "Send".

For every valid frame received, the board returns an acknowledgement :

```
!<Command><Data><LF>
```

3. Control Commands

Two categories of commands are defined :

1. Control Commands
2. Information Commands

1. Setpoint Command (Closed Loop)

\$CXXX<LF>

- XXX : Setpoint value in RPM
- Range for the WLG-20 : 0 to 380
- Range for the WLG-30 : 0 to 250
- Range for the WLG-75 : 0 to 250

3. Control Commands

2. Frequency Command (Open Loop)

```
$FXXXXXX<LF>
```

- **XXXXXX** : Raw frequency value
- Range : FMIN to FMAX in Hz

3. Control Mode Selection

```
$LX<LF>
```

- **X = 0** : Open loop (uses F)
- **X = 1** : Closed loop (uses C)

3. Control Commands

4. Rotation Direction Command

`$SX<LF>`

- **X = 0** : Counterclockwise
- **X = 1** : Clockwise

5. Motor Start / Stop Command



*For this command, it's the capital letter "O"
not the number "0".*

`$OX<LF>`

- **X = 0** : Stop motor
- **X = 1** : Start motor

3. Control Commands

6. Calibration Command

\$KX<LF>

- X = 0 : Reset calibration
- X = 1 : Start calibration

7. Index Command

\$I<LF>

Action : Force mechanical indexing (homing) on the sensor index at the setpoint speed.

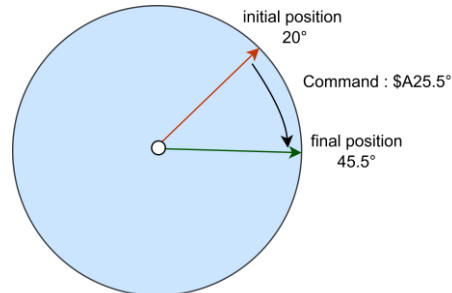
3. Control Commands

8. Angular Positioning Command

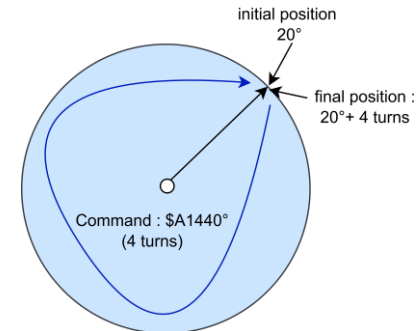
`$AXXXXXX<LF>`

- **XXX XXX** : Target angle value in degrees
- Range : 0 to +9999,9 degrees
- Relative position to the stopping position
- The motor moves until it reaches the specified angle

Examples :



Or



4. Information Commands

All information commands start with **\$D**.

1. Speed Reading

```
$DS<LF>
```

Expected response :

```
speed:XXX.XXX
```

- Value in RPM
- Floating point numeric format with one decimal place

 Note : Original source used "**vitesse** : XXX.XXX"

4. Information Commands

2. Angle Reading

```
$DA<LF>
```

Expected response :

```
Angle:XXX.XXX
```

- Angular measurement in degrees
- Floating point numeric format with one decimal place



Note : The angle is **calculated** from the moment the motor is **powered up** by the board.

5. LED Error Codes

Error Type	Description	LED Pattern
Overcurrent	Board current is too high to operate safely.	Blinking every 200 ms
Motor Stalled	The motor is stuck or blocked.	Steady ON (No blinking)
Calibration Failed	Calibration was not performed correctly. No starting frequency defined.	Blinking every 1 second

5. USB/UART/CAN communication

USB & UART Communications	
Communication speed	115200 bauds
Data length	8 data bits
Parity bit	None
Stop bit	1 bit

CAN Communication	
Bit rate	500 000 bit/s
Operating mode	Normal mode
Bit segment 1 (BS1)	13TQ
Bit segment 2 (BS2)	2TQ
Prescaler	4

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