

NEVO SERIES I²C Interface

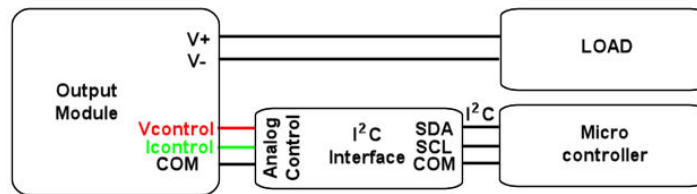


600 watt in the palm of your hand

The NEVO series are modular, user configurable power supplies offering unrivalled performance and flexibility. Our standard output modules offer voltages from 1.5V_{DC} to 58V_{DC} and can deliver up to 25A per module. The NEVO also offers customers the potential to connect output modules in series or parallel resulting in output voltages of up to 240V_{DC} and output currents of up to 100A at output powers of up to 600 watts. The flexibility of the NEVO power platform enables customers to configure solutions locally for almost any application.

All output modules (excluding OP5) have full range analogue remote control of both voltage and current and with the release of the new I²C Interface, the NEVO output modules can be easily controlled using low cost microcontrollers.

The I²C Interface plugs directly into each output module and provides a standard I²C bus as an alternative to the normal analogue controls. The interface connects to J5 on the output module and provides a similar socket for connection to the user application as shown below.



The output voltage and current limit can then be controlled in +/- 31 steps that are programmed through the I²C Interface. Careful consideration must be given to system grounding as the interface is not isolated and must be referenced to the COM pin on J5. Incorrect system grounding may cause damage to the unit. Adhere to the same precautions as for “Local bias supply” detailed on page 16 of the user manual or contact Vox Power for assistance.

I²C Slave Address

Each interface can be programmed to any one of nine slave addresses via on-board dip switches.

| Switch setting (1=ON, 0=OFF, X=Don't care) | | | | Slave Address |
|--|---|---|---|---------------|
| 1 | 2 | 3 | 4 | |
| 0 | 0 | 0 | 0 | 90h |
| 0 | 1 | X | 0 | 92h |
| 1 | 0 | 0 | X | 94h |
| 1 | 1 | X | X | 96h |
| 0 | 0 | 0 | 1 | 98h |
| 0 | 1 | X | 1 | 9Ah |
| 0 | 0 | 1 | 0 | 9Ch |
| 1 | 0 | 1 | X | 9Eh |
| 0 | 0 | 1 | 1 | A0h |

Memory Organisation

| Memory address | Control function |
|----------------|------------------|
| F8h | Voltage |
| F9h | Current |

Register format

| MSB | | | | | | | LSB |
|-----|---|---|----------------|----------------|----------------|----------------|----------------|
| S | X | X | D ₄ | D ₃ | D ₂ | D ₁ | D ₀ |

S = sign bit (0b)

X = Reserved (00b)

D_x = 5 bit data (00000b), () indicate power on default.

I²C protocol and timing diagrams are available on request.

Ordering Information – P/N: I²C Interface

Vox Power Ltd. reserves the right to change or improve any part of the specification, electrical or mechanical design or manufacturing process without notice. Please consult your local distributor or contact Vox Power to ensure that you have the latest specification before using your product. For other information relating to the use of the product please refer to the latest NEVO user manual. Vox Power reserves the right to make changes without notice to any of its products. Vox Power does not assume any liability arising out of the use or application of any of its products and of any information to the maximum extent permitted by law. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vox Power. VOX POWER DISCLAIMS ALL WARRANTIES AND REPRESENTATIONS. IN PARTICULAR ALL OTHER WARRANTIES, CONDITION OR TERMS RELATING TO SUITABILITY, FITNESS FOR PURPOSE, MERCHANTABILITY OR CONDITION OF THE PRODUCTS AND WHETHER EXPRESS OR IMPLIED BY STATUTE OR COMMON LAW OR OTHERWISE ARE EXCLUDED.

Document DOC6011 rev 01

Voltage Control

Memory address = F8h

Adjust range = +/-100% of voltage set with potentiometer

Adjust resolution = +/-5 bit (3.226% steps)

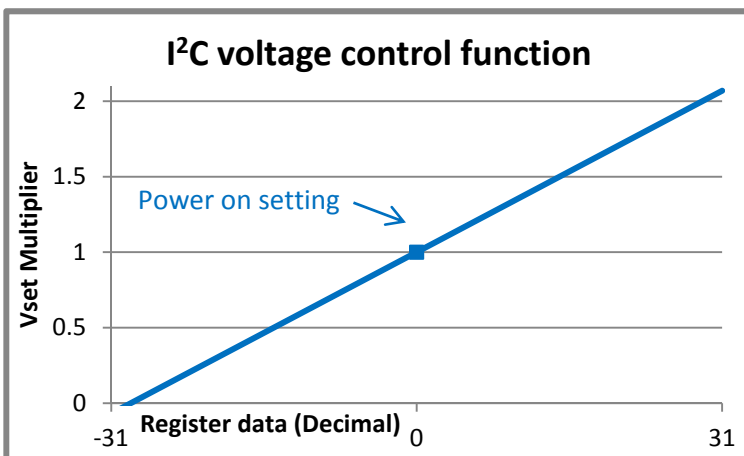
Power on setting = 0% adjust (eg. $V_{out} = V_{set}$)

Control equations:

$$V_{out} = V_{set} * (1 + Data/29) \quad [1]$$

or

$$Data = 29 * ((V_{out}/V_{set}) - 1) \quad [2]$$



Example 1: OP1, $V_{set} = 5V$, $V_{adjust} = 2.07V$, I²C address = 90h, Voltage adjust register = F8h

Use equation 2 to find the required data byte: $29 * ((2.07/5) - 1) = -17$ (91h)

Send the following data over the I²C bus:

| I ² C address | Register | Data |
|--------------------------|----------|------|
| 90h | F8h | 91h |

Example 2: OP2, $V_{set} = 6V$, $V_{adjust} = 12V$, I²C address = 92h, Voltage adjust register = F8h

Use equation 2 to find the required data byte = $29 * ((12/6) - 1) = 29$ (1Dh)

Send the following data over the I²C bus:

| I ² C address | Register | Data |
|--------------------------|----------|------|
| 92h | F8h | 1Dh |

Current Control

Memory address = F9h

Adjust range = 0 to 110% of rated current

Adjust resolution = +/- 5 bit (1.75% I_{rated} steps)

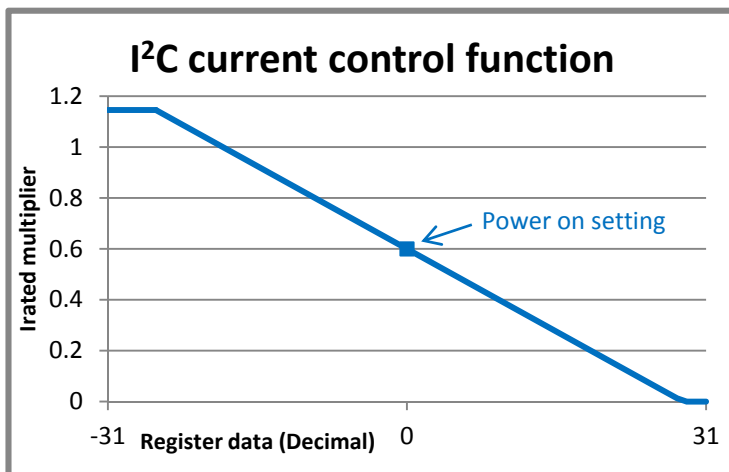
Power on setting = 0.6*I_{rated}

Control equations:

$$I_{out} = I_{rated} * (0.6 - 0.65 * (Data/31)) \quad [1]$$

or

$$Data = -31 * ((I_{out} - (0.6 * I_{rated})) / (0.65 * I_{rated})) \quad [2]$$



Example 1:

Setup: OP1, I_{rated} = 25A, I_{adjust} = 10A, I²C address = 90h, Current adjust register = F9h

Use equation 2 to find the required data byte => Data = $-31 * ((10 - (0.6 * 25)) / (0.65 * 25)) = 9.54$ (0Ah)

Equation 1 will give the quantized setting => I_{out} = $25 * (0.6 - 0.65 * (10/31)) = 9.758A$

Send the following data over the I²C bus:

| I ² C address | Register | Data |
|--------------------------|----------|------|
| 90h | F9h | 0Ah |

Example 2:

Setup: OP3, I_{rated} = 7.5A, I_{adjust} = 5A, I²C address = 98h, Current adjust register = F9h

Use equation 2 to find the required data byte => Data = $-31 * ((5 - (0.6 * 7.5)) / (0.65 * 7.5)) = -3.18$ (83h)

Equation 1 will give the quantized setting => I_{out} = $7.5 * (0.6 - 0.65 * (-3/31)) = 4.97A$

Send the following data over the I²C bus:

| I ² C address | Register | Data |
|--------------------------|----------|------|
| 98h | F9h | 83h |