

# GV204

## Impulse Splitter for Incremental Encoders



- Programmable encoder input A, /A, B, /B, Z, /Z, for use with RS422 or TTL differential signals or with HTL signals (differential or single-ended)
- Two encoder outputs (A, /A, B, /B, Z, /Z each), with individually programmable output levels (TTL 5 V or HTL 10 - 30 V)
- Max. frequency 750 kHz (TTL) or 300 kHz (HTL)
- Power supply either 5 V DC or 10 - 30 V DC
- Aux. voltage output +5 V for encoder supply (with 10 -3 0V power supply)

# Operating Instructions



## Safety Instructions

- This manual is an essential part of the unit and contains important hints about function, correct handling and commissioning. Non-observance can result in damage to the unit or the machine, or even in injury to persons using the equipment !
- The unit must only be installed, connected and activated by a qualified electrician
- It is a must to observe all general and also all country-specific and application-specific safety standards
- When this unit is used with applications where failure or maloperation could cause damage to a machine or hazard to the operating staff, it is indispensable to meet effective precautions in order to avoid such consequences
- Regarding installation, wiring, environmental conditions, screening of cables and earthing, you must follow the general standards of industrial automation industry
- - Errors and omissions excepted –

Version:	Description:
GV20401a/af/hk_Sept08	First edition

# Table of Contents

1. Compatibility Hint .....	4
2. Application .....	5
3. Block Diagram .....	5
4. Power Supply .....	6
4.1. Supply from an unstabilized 10 - 30 volts DC source	6
4.2. Supply from a stabilized +5 volts DC source	6
5. Impulse Inputs .....	7
6. Impulse Outputs and Output Levels .....	8
7. Dimensions.....	9
8. Specifications.....	10

# 1. Compatibility Hint

This product has been designed as a replacement of the following two units:

- GV202 (dual splitter with TTL Input)
- GV203 (dual splitter with HTL input)

The new GV204 model is fully compatible to the previous models with all functions, connections, dimensions and technical specifications. Merely the successor model provides an additional DIL switch to set the input format to either TTL or HTL level, which allows to replace both parent models by just one new model.

Moreover, GV204 provides a few technical upgrades (e.g. higher frequencies), resulting in increased quality without affecting the compatibility.

## 2. Application

The GV 204 splitter has been designed for proper and trouble-free splitting of encoder signals to two target units. Where signals have to be distributed to more targets, it is easy to cascade several units (or to use a multi-splitter like GV470)

If applicable, the unit can at the same time operate as a level converter between TTL/RS422 levels and HTL (10-30V) levels.

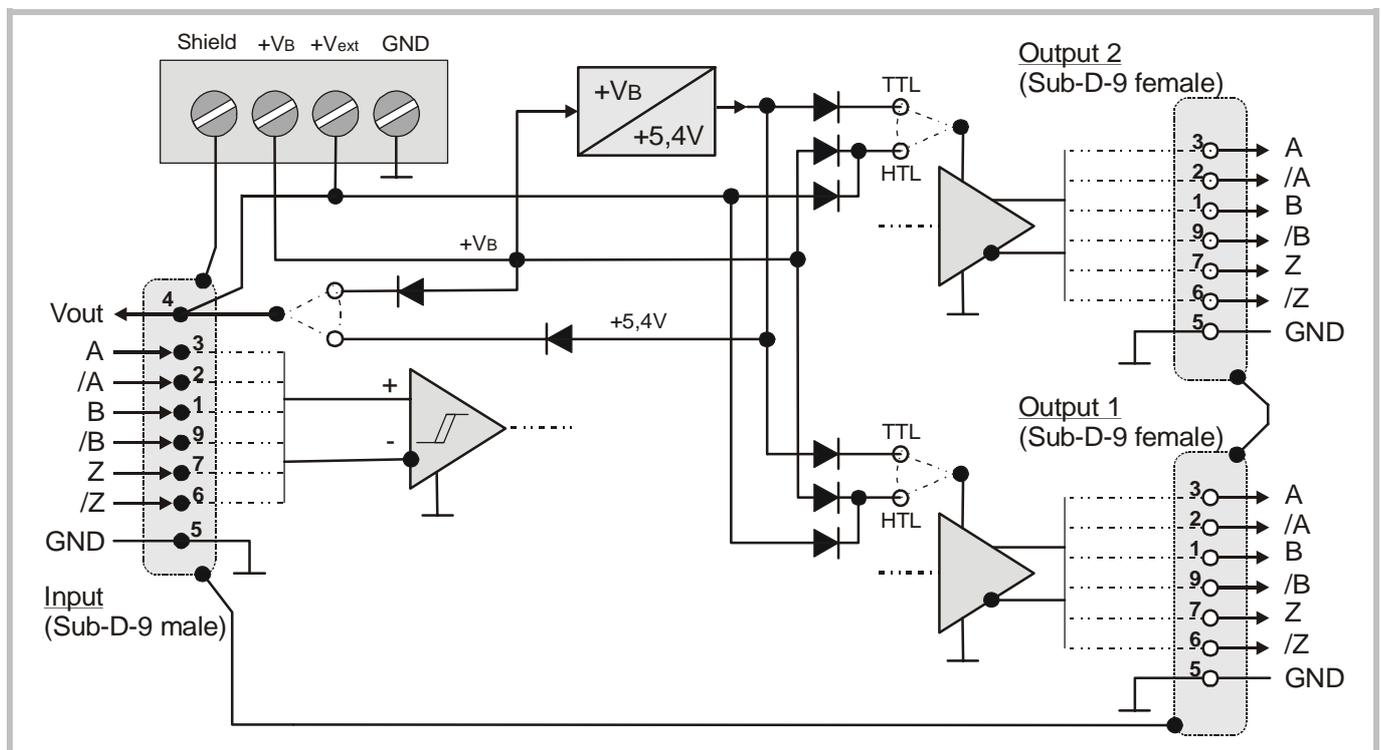
It is possible to use only inputs **A, B, Z** and leave the inverted inputs **/A, /B, /Z** unconnected (single-ended signals with HTL level)

When all signals **A, /A, B, /B, Z, /Z** are available, GV 204 will accept all industrial impulse formats and levels like RS422, TTL-differential, HTL-differential).

The outputs provide all signals **A, /A, B, /B, Z, /Z**, even when the inverted signals are not available on the input site. The output signal level is individually selectable to 5 volts or to 10 - 30 volts, by corresponding DIL switch setting.

## 3. Block Diagram

The subsequent block diagram shows all essential circuit details of a GV204 unit:



## 4. Power Supply

### 4.1. Supply from an unstabilized 10 - 30 volts DC source

In general, the unit is supplied with an unstabilised DC voltage of 10 - 30 V, using the screw terminals **+V<sub>B</sub>** and **GND**. In this case pin 4 of the input Sub-D-connector will also provide a +5 V auxiliary output for encoder supply (max. 150mA).

### 4.2. Supply from a stabilized +5 volts DC source

The unit accepts also stabilized supply from a +5 V source (e.g. when the input comes from the encoder simulation of a drive which is also intended to supply the splitter). In this case, **Pin 4 (+5 V)** and **Pin 5 (GND)** of the 9-position input connector are suitable to apply power.



Units supplied with 5 volts only are unable to generate output levels higher than 5 volts, unless a corresponding voltage is applied to screw terminal +Vext.

The screw terminal marked "**Shield**" connects the metallic housings of the Sub-D-connectors only. Depending on individual needs for earthing and screening, it can remain unconnected or tied to earth or to unit GND.

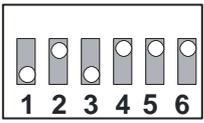
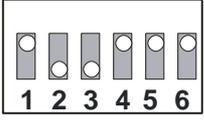


- For technical reasons no reverse polarity protection is available when the unit is supplied with +5 volts only. Wrong polarity misconnection of the 5 volts power may cause serious damage to the unit.
- Screw terminal "+Vext" and pin 4 of the 9-position input connector are galvanically connected inside the unit. It is therefore not allowed to apply different potentials to these two positions

## 5. Impulse Inputs

The input impulses must be applied to the 9-position Sub-D-connector marked "Input" (male connector on unit site). The pin assignment is shown in the block diagram and is also printed to the top side of the unit.

The 6-position DIL switch on top of the unit provides setting of the desired input characteristics. With most of all practical applications one of the following two configurations will be suitable:

Switch Setting	Acceptable Signal Levels	Required Input Signals	Aux. Output Pin 4 (Encoder Supply)
	RS422 (Diff.>1V) TTL (5 V) HTL (10 - 30 V)	Differential signals A, /A , B, /B, Z, /Z (inverted signals are "must")	+5,4 V (respectively $V_{ext.}$ *)
	HTL (10 - 30 V)	Single-ended signals A, B, Z (no inverted signals required)	+ $V_B$ - 1,4 V (respectively $V_{ext.}$ **)

Other switch positions than shown above are reserved for special applications and must only be used upon advice of motrona.

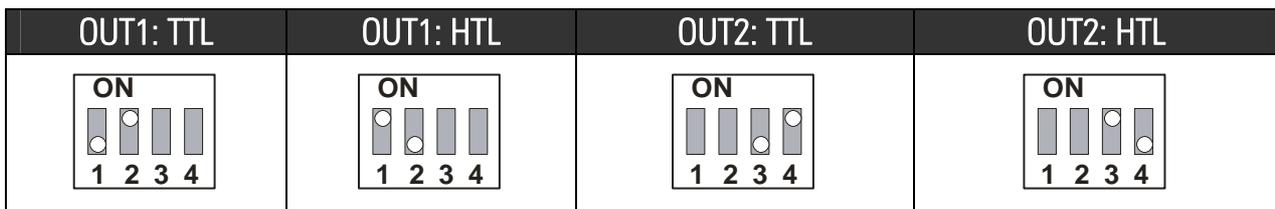
\*) Where for encoder supply a voltage higher than 5.4 volts should be required, please apply an appropriate voltage to terminal +Vext.

\*\*) Where for encoder supply a voltage higher than + $V_B$  should be required, please apply an appropriate voltage to terminal +Vext.

## 6. Impulse Outputs and Output Levels

The output signals are available on the two Sub-D-connectors marked "OUT1" and "OUT2" (female connectors on unit site). The pin assignment is shown in the block diagram and is also printed to the top side of the unit.

The four-position DIL-Switch provides individual setting of the output levels for each of the two output channels. At any time also the inverted signals will be available at the output, even when no inverted signals appear at the input.



With output format "TTL" the output level is always 5 volts.

With output format "HTL" the output level approximately corresponds to the supply voltage  $V_B$ \*)

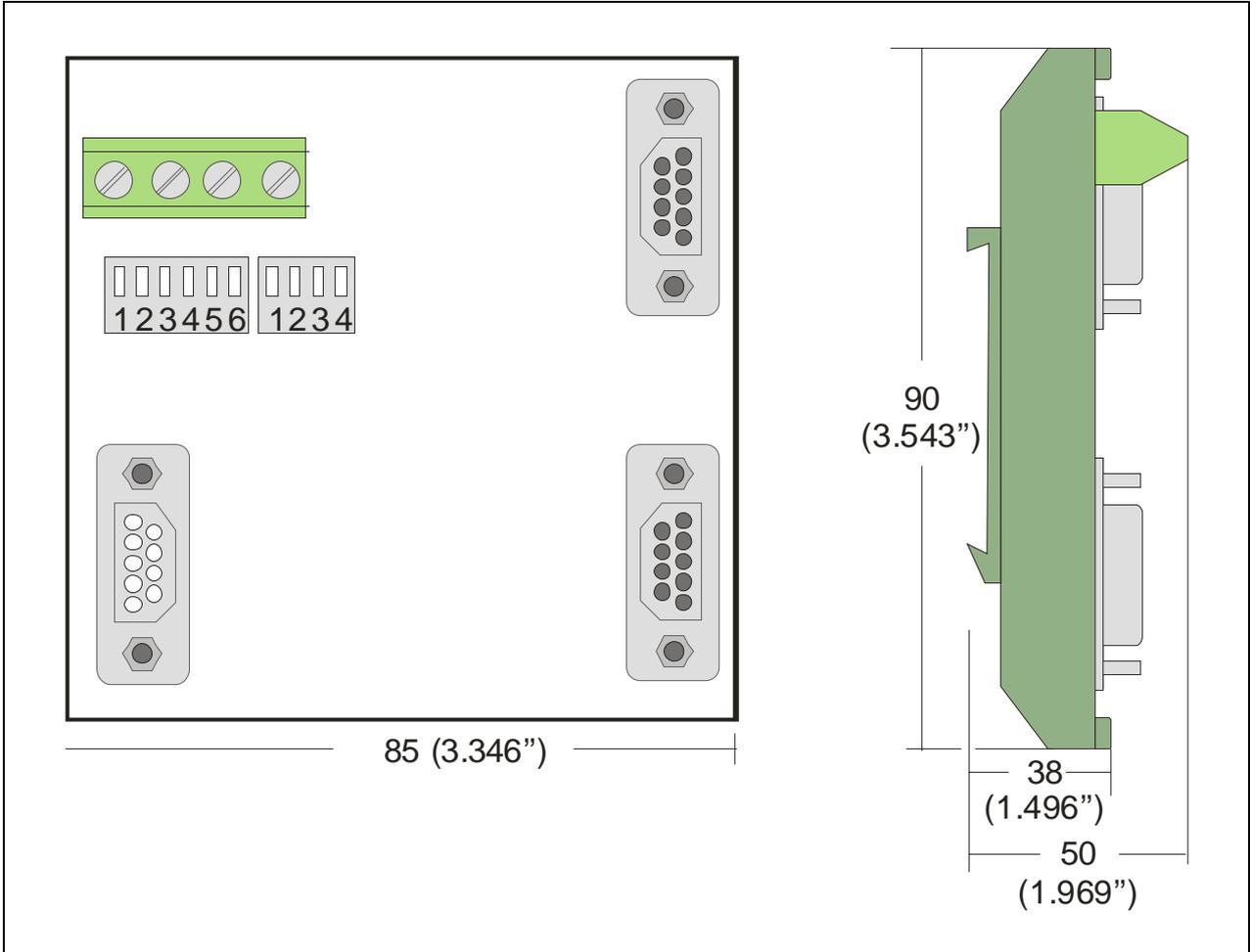
When terminal  $+V_{ext}$  receives a voltage higher than the power supply  $V_B$ , the output level will correspond to  $+V_{ext}$  \*).



Units supplied with 5 volts only are unable to generate output levels higher than 5 volts, unless a corresponding voltage is applied to screw terminal  $+V_{ext}$ .

\*) Voltage drop is about 1.4 volts

# 7. Dimensions



## 8. Specifications

Power supply	:	$V_B$	=	10 - 30 V DC	<u>or</u>
		$V_{ext}$	=	5 - 30 V DC	
Current consumption	:	approx. 5 mA to 50 mA dependent on input voltage and output loads (always with the aux. encoder supply output unloaded)			
Aux. output	:	+5.4 volts, max. 150 mA (only available with 10-30V supply)			
Max. Frequency	:	750 kHz (RS422 and TTL differential) 300 kHz (HTL)			
Inputs	:	Symmetric (differential) inputs A, /A, B, /B, Z, /Z (RS422 or TTL level or HTL 10 - 30 V level)  Asymmetric (single-ended) inputs A, B, Z (HTL level 10 - 30 V)			
Outputs	:	2 x A, /A, B, /B, Z, /Z selectable 5 V TTL or 10 - 30 V HTL push-pull, max. 30 mA			
Propagation delay	:	700 ns			
Ambient temperature	:	Operation: 0 - 45°C (32 – 113°F) Storage: -25 - +70°C (-13 – 158°F)			
Weight	:	Approx. 120 g			
Conformity and standards:		EMC 89/336/EEC:		EN 61000-6-2 EN 61000-6-3	
		LV73/23/EEC:		EN 61010-1	
Ordering information	:	Encoder Splitter <u>GV 204</u>			