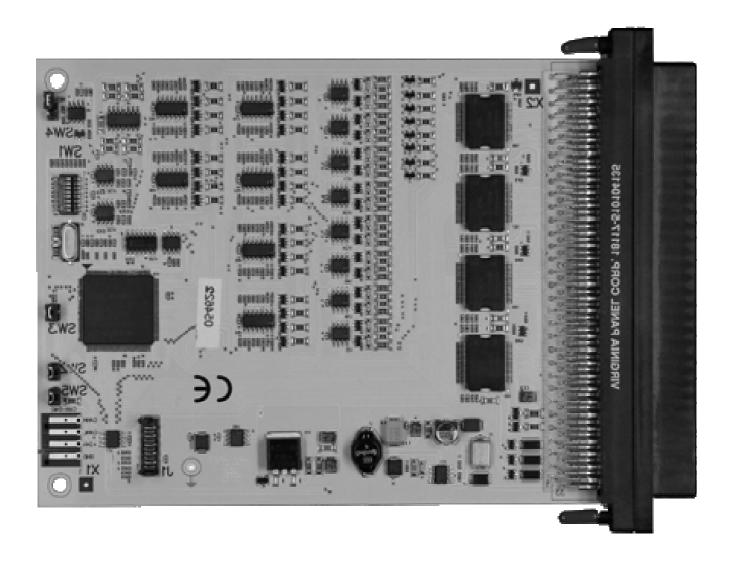


Created 7/07/09 Updated 25/03/10

# **Multifunction module**

# YAV90832

620022E2





This manual is related to the following product :

Product – P/N	YAV90832	
Hardware version	01.01	
Sofware version	03.02	
Issued date	23/01/2010	

**Check signatures** 

Structure	Contents	Schematics	Technical features
Sales	Integrtation Mgr	R+D	R+D (Lab)

**Document History** 

Version	Issued date	Reason
V1	09/2006	Preliminar version
V2	03/2010	





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This technical information has been produced, written and checked ensuring the greatest accuracy and simplification. Despite this, should you find any mistake or detail that could contribute to improving the product or its documentation, we would appreciate you letting us know. Your contribution will be very welcome.





# 0. Safety

Follow the following safety measures to avoid and prevent damaging this product, products connected to it, or people.

Only qualified and entitled personnel are authorized to carry out operations of installation and routine on the devices described in this manual. The company installing it would bear responsibility for any security or operating failure of the lift, when such failure is due to the parameters incorrect programming.

The product described in this manual can be configured to comply with the ruling of different countries. The manufacturer does not hold any responsibility if the company installing it does not configured it according to the legal, commercial or security prescriptions that may be in force in the place of installation or otherwise agreed with the customer.

Should you need to access other components of the system while you are using this product, as a measure of precaution, read the General Safety Summary in the other products manual.

## 0.1 Symbols and safety terms

The following symbols may appear on the product or its documentation



Consult the specifications of the product for IEC Installation Category and Safety Classification.

## 0.2 Precautions against damage to people

the power on.

Do not work on the product with To avoid electrical discharge, this product must not be handled with the system powered on and in any case can operate without the protective covers.

The device has mobile parts that can be in motion by operating electric or electronic control units. Check through-out each one of the security devices before the unit comes into operation.

Before starting any operation, make sure that there are no people who could be affected by any moving part.

Each one of the safety switches must be individually checked and, under no circumstances, the device must remain on service without ensuring the correct operation of the security devices.

Due to the continuous products improvement, the indications of the present manual can be modified without previous warning and in any case are a contract commitment. The present information publishing does not represent resignation of intellectual property or patent.

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<sup>&</sup>lt;sup>1</sup> The qualified staff must have proved their technical knowledge of this product and should have the corresponding accreditation.



## 0.3 Precautions against damage to the product

other electronic elements when powered up

Do not insert / unplug cards or The connection/disconnection of the I/O's when plugged to the power could produce a sequence of connections that could damage electronic components which had been previously connected to their corresponding reference earth.

Do not use insulation testers.

The insulation testers work at very high voltages, and are capable of destroying the semiconductors. Under no circumstances should the "Megger" type of testers be used between electronic systems.

Do not force the connection tag strips

The connection tag strips are connected exerting a small pressure. If you encounter difficulty to plug them this may mean that they are upside down or not aligned. If they are forced, besides the damage to the strip you can cause damages on the electronics.

Secure the ground connections quality.

All the ground connections must be star-type and with the suitable section. Loop ground connections are potential receptor antennas with capacity to generate important current peaks.

Use suitable packing material for transportation

An electronic module with a lot of fragile components should be transported with a good protection packaging. A collision can cause damages that could appear long time after the start up.

Do not install this product near heat sources, strong vibrations or high humidity that exceeds the technical specifications.

Check that the product works without vibrations that exceed the maximum levels specified, and which could damage its integrity or cause a contact to become disconnected. The product should work without humidity and in the temperature range detailed in the technical specifications.

# 0.4 Limits of the guarantee

- 1. Products are supplied to the latest available development state at the time of manufacture. Should there be any future changes for functional or productive improvements of the products; the manufacturer does not hold any obligation to reprocess at no charge the products that have been already manufactured to upgrade them to the latest versions.
- 2. All the products supplied by S.A. Sistel have passed all established quality controls as well as the EMC (Electromagnetic Compatibility Checks). The manufacturer cannot be held responsible for any damage produced by defective manipulation, installation or incompatibility with other products.
- 3. The products' guarantee will only be in force when the installation has been done in accordance with the technical prescriptions in this manual and the settled general



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standards: Low Voltage Electro Technical Regulation (or equivalent for each country) and CE regulations for the Electromagnetic Compatibility.

- 4. The commutation of highly unsettling loads nearby (Frequency converters, doors operators, coils, fluorescent lamps, contactors, etc.), require the installation of the corresponding interference suppression/reduction resources and connections to earth are required<sup>2</sup>. If these requirements are not followed or are defectively installed there may be severe failures in the electronic devices, for which the installing company will be held responsible.
- 5. All equipment under guarantee that be sent for repair must have the manufacturing label with its serial number
- 6. The guarantee period is two working years.
- 7. Device operation under thermal or voltage conditions out of technical specifications detailed in this operation manual cancels guarantee terms.

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<sup>&</sup>lt;sup>2</sup> RF filters on the input and output frequency converters, RC net, diodes and/or varistors in the coils, screened cables in the VVVF motors, screened starters, etc.



# 1. General description of the module

### 1.1 Characteristics

- 40 inputs: 16 unipolar 10 bit Analog & three groups of 8 (24 in total) digital input with selectable voltage level
- 32 Outputs (MOS) with independent supply in groups of 8 protected and monitored
- 4 analog outputs, unipolar from 0..+15Vdc
- 4 PWM outputs
- Powerful commands to read the values with triggered automatic filters
- VPC tripaddle connector
- CAN bus controlled, with address and speed selection
- National Instruments Lab View drivers

## 1.2 Description

YAV90832 inputs and outputs are sharing the common from the 24Vdc power supply. This common must be connected to the DUT common to operate.

Analog inputs accept up to +15Vdc voltages with an acquisition resolution of 10 bits ±1. They are protected up to +50V.

Digital inputs are organized in groups of 8, conforming banks. The first bank has 16 inputs while the second one has 8 inputs. Each bank has a terminal to set the voltage level to judge the digital value. The board features two reference outputs available (+2,5V and +5V) to be used as trigger level, ina direct manner or through a voltage divider.

Digital Outputs are organized in groups of 8. Each group has an independent supply voltage pin. They can work from +11Vdc to +45Vdc, sourcing up to 600mA. Failure monitoring for each group is available.

6 outputs can be used either as powered digital outputs (from terminal 89 to terminal 96) or as modulated outputs: additional four analog ports (from 57 to 60) and four PWM ports (from 61 to 64). When modulated outputs are being used (analog or PWM), the logical status of the digital outputs will be a squared wave which is ON time proportional to the value of that modulated output.

Digital inputs 21-23 and 22-24 can be set as incremental encoder iputs (two cannel 90° quadrature, up to 1MHz)





# 1.3 Applications

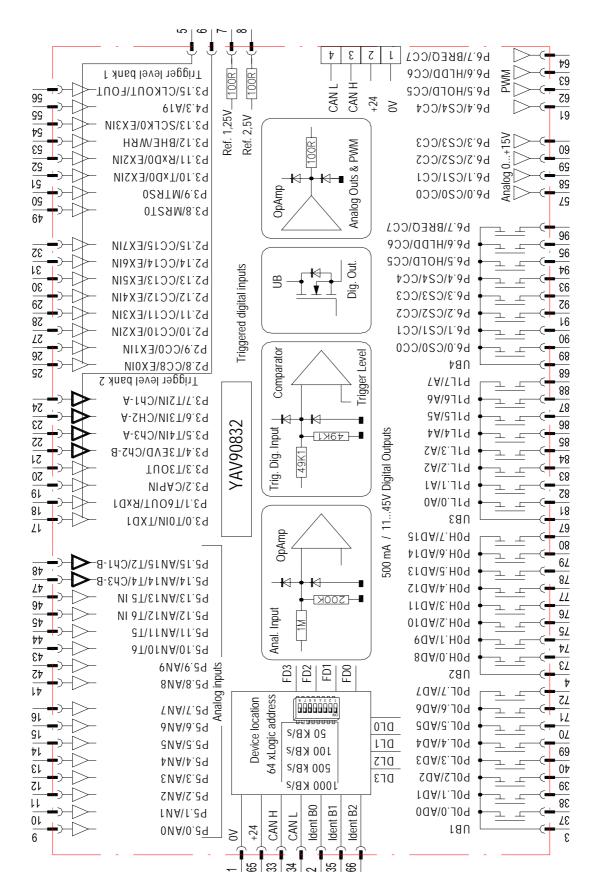
- Digital signals monitoring
- Analog input and output
- Encoder emulator
- Fast counters
- Relay and/or load actuators

## 1.4 Technical data

Parameter	Pnemonic	Condition		Units		
			Min	Nominal	Max	
Analog inputs						
Voltage measurement	V <sub>AIN</sub>		0		15	$V_{DC}$
Input impedance	R <sub>AIN</sub>		-	1.2	-	MΩ
Measuremnet resolution	MR		-	10	-	Bits
Maximum uncertanty				<u>+</u> 1		Bit
Digital inputs PNP						
Input voltage	V <sub>DIN</sub>		0		30	$V_{DC}$
Input impedance	R <sub>DIN</sub>			100		kΩ
Hysteresis	V <sub>HIS</sub>					mV
Trigger level voltage for logic 1	$V_{TRG}$		2,5		5	kΩ
Encoder inputs						
Trigger voltage	V <sub>DIN</sub>					$V_{DC}$
Maximum counting frequency	F <sub>MAX</sub>					Hz
Voltage references		•	•		l.	
2V5 Voltage reference	V <sub>R2V5</sub>		2.475	2.500	2.525	V <sub>DC</sub>
Internal resistance	R <sub>R2V5</sub>			100		Ω
Tensión de referencia 1V25	V <sub>R10V</sub>		1.237	1.250	1.2625	VDC
Resistencia interna	R <sub>R10V</sub>			100		kΩ
Digital Outputs PNP	•	•	•			
Current	I <sub>OUT</sub>	Permanent	-	625	-	mA
Internal resistance	R <sub>out</sub>	On mode	-	200	-	mΩ
Working voltage	V <sub>out</sub>		11	-	45	$V_{DC}$
Working temparature	T <sub>WRK</sub>		5	-	65	°C
Analog Outputs						
Short circuit current Source mode (V=0V)	I <sub>OUTSource</sub>	Permanent	16	16	16	mA
Short circuit current Sink mode (V=0V)	I <sub>OUTSink</sub>	Permanent	11	11	11	mA
Internal resistance	R <sub>out</sub>			100		Ω
Output Voltage	V <sub>out</sub>		0	-	15	$V_{DC}$
PWM Outputs					İ	
Current	I <sub>OUT</sub>	Permanent		625		mA
Frequency (variable duty cycle)	F <sub>out</sub>			10		kHz
Internal resistance	R <sub>out</sub>			200		mΩ
Working voltage	V <sub>out</sub>		3		50	$V_{DC}$



## 1.5 Module functional block







# 1.6 Pin out

Mod	ule function	Receiver Pos. #				
			. Module P/N	510 108 126		
YAV90832 : PNP 38 IN / 32 OUT					. contact P/N	610 110 108
					. Patchcord	720 102 101
Pin	Description	Pin	Description	Pin	Descrip	tion
1	GND	33	CAN H	65	+24V	
2	IDENT – B0	34	CAN L	66	IDENT – B2	
3	+UB1	35	IDENT . B1	67	+UB3	
4	+UB2	36		68	+UB4	
5	Bank 1 trigger level input	37	PNP Digital output 0	69	PNP Digital output 4	
6	Bank 21 trigger level input	38	PNP Digital output 1	70	PNP Digital output 5	
7	5V trigger level output	39	PNP Digital output 2	71	PNP Digital output 6	1
8	2V5 trigger level output	40	PNP Digital output 3	72	PNP Digital output 7	'
9	Analog input 0	41	Analog input 8	73	PNP Digital output 8	
10	Analog input 1	42	Analog input 9	74	PNP Digital output 9	
11	Analog input 2	43	Analog input 10	75	PNP Digital output 1	0
12	Analog input 3	44	Analog input 11	76	PNP Digital output 1	1
13	Analog input 4	45	Analog input 12	77	PNP Digital output 1	2
14	Analog input 5	46	Analog input 13	78	PNP Digital output 1	3
15	Analog input 6	47	Analog input 14 / Encoder 3 ChB	79	PNP Digital output 1	4
16	Analog input 7	48	Analog input 15 / Encoder 1 ChA	80	PNP Digital output 1	5
17	Digital input 0	49	Digital input 16	81	PNP Digital output 1	6
18	Digital input 1	50	Digital input 17	82	PNP Digital output 1	7
19	Digital input 2	51	Digital input 18	83	PNP Digital output 1	8
20	Digital input 3	52	Digital input 19	84	PNP Digital output 1	9
21	Digital input 4/ Encoder 2/ChB	53	Digital input 20	85	PNP Digital output 2	0
22	Digital input 5/Encoder 3/ChA	54	Digital input 21	86	PNP Digital output 2	1
23	Digital input 6/Encoder 2/ChA	55	Digital input 22	87	PNP Digital output 2	
24	Digital input 7/Encoder 1/ChA	56	Digital input 23	88	PNP Digital output 2	
25	Digital input 8	57	Analog Output 0	89	PNP Digital output 2	
26	Digital input 9	58	Analog Output 1	90	PNP Digital output 2	
27	Digital input 10	59	Analog Output 2	91	PNP Digital output 2	
28	Digital input 11	60	Analog Output 3	92	PNP Digital output 2	
29	Digital input 12	61	PWM 1 /Digital P6.4	93	PNP Digital output 2	
30	Digital input 13	62	PWM 2 /Digital P6.5	94	PNP Digital output 2	
31	Digital input 14	63	PWM 3 /Digital P6.6	95	PNP Digital output 3	
32	Digital input 15	64	PWM 4 /Digital P6.7	96	PNP Digital output 3	



## 2. Certifications

# 89/336/CEE Directive Declaration of Conformity

S.A. Sistel declare, under our sole responsability, that the product

YAV90832 - Multifunctionboard with 80 in/out

to which this declaration relates, meets the provisions of the EU Directives listed below:

- Electro Magnetic Compatibility (EMC) directive, 89/336/ECC referreing to
- Low voltaje directive, 73/23/EEC

and therefore, the CE mark showed below is applied.

For accessories or other elements that can be connected to this product, see their corresponding Declaration of Conformities

The conformity mark is given by the CE mark and the year when it was applied



Authorized by:

J) (69)

Representative: Jordi Batet Title: General Manager

Company: SA Sistel - Barcelona

Barcelona, January 7th 2010



# 3. CAN messages

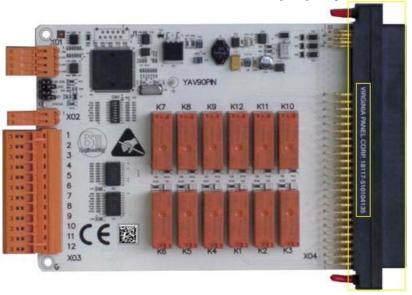
Following you will find the CAN messages available for communicating and operating with YAV90832

YAV90832	1										
Action	Dir	Ident	Length	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Set OFF One Relay	RX	0x155101xx	4	0x01	0x01	Relay	0x00		8	-	3
Set ON One Relay	Rx	0x155101xx	4	0x01	0x01	Relay	0x01				
TOGGLE One Relay	Rx	0x155101xx	4	0x01	0x01	Relay	0x02				
BLINK One Relay	Rx	0x155101xx	4	0x01	0x01	Relay	0x03				
PULSE ON One Relay	Rx	0x155101xx	5	0x01	0x01	Relay	0x04	Time (10ms)			
PULSE OFF One Relay	Rx	0x155101xx	5	0x01	0x01	Relay	0x05	Time (10ms)			
ASK One Relay	Rx	0x155101xx	3	0x01	0x02	Relay					8 0
One Relay Status		0x155201xx	4	0x01	0x02	Relay	Status	Deleve 0	Deleve 3	2-00	
Set OFF Several Relays	Rx	0x155101xx	7	0x01	0x03	Relays 0	Relays 1	Relays 2	Relays 3	0x00	
Set ON Several Relays	RX	0x155101xx		0x01	0x03	Relays 0	Relays 1	Relays 2	Relays 3	0x01	
TOGGLE Several Relays BLINK Several Relays	Rx Rx	0x155101xx 0x155101xx	7	0x01 0x01	0x03 0x03	Relays 0 Relays 0	Relays 1 Relays 1	Relays 2 Relays 2	Relays 3 Relays 3	0x02 0x03	
-	Rx	0x155101xx	8	0x01	0x03	_			Relays 3	0x04	Time (40me)
PULSE ON Several Relays PULSE OFF Several Relays	RX	0x155101xx	8	0x01	0x03	Relays 0 Relays 0	Relays 1 Relays 1	Relays 2 Relays 2	Relays 3	0x05	Time (10ms) Time (10ms)
Set OUT All Relays	Rx	0x155101xx	7	0x01	0x03	Relays 0	Relays 1	Relays 2	Relays 3	0x06	Time (Turns)
ASK ALL Relays	Rx	0x155101xx	3	0x01	0x04	Autosend	rveiayo i	rveiayo 2	rvelayo 0	UXUU	
All Relays Status		0x155201xx	6	OxD1	0x04	Relays 0	Relays 1	Relays 2	Relays 3		
All Nedys Statut	I.A.	UK 100201XX		UNUT	0.004	neayou	TVEIdyo I	relayo 2	rvelayou		2
Action	Dir	Ident	Length	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
All Fault Status		0x155201xx	Congui	OxD1	0x10	Faults	Dylos	Dy to 4	Dyte o	Dytes	Dyte i
Per raut Status	I A	UK 10020 TAX		UNDT	OXIO	1 duno			S 37	-	
Action	Dir	Ident	Longits	Budo 0	Podo 1	Dido 2	Byte 3	Budo 4	Dien E	Pudo C	Buto 7
Read I2C Data Word 24LC256	Rx	0x155101xx	Length 5	Byte 0 0x01	Dyte 1 0xFA	Byte 2 0xF1	ADD LOW	Byte 4 ADD HIGH	Byte 5	Byte 6	Byte 7
		0x155101xx		0x01	0xFA	0xF1	ADD LOW		DATLOW	DATHER	
Write I2C Data Word 24LC256	RX Rv		7					ADD HIGH	DATLOW	DAT HIGH	
Write I2C Page (32 Words) 24LC256 Write I2C All (16384 Words) 24LC256	Rx Rx	0x155101xx 0x155101xx	7 5	0x01 0x01	0xFA	0xF3 0xF4	DAT LOW	ADD HIGH DAT HIGH	DATLOW	DATHIGH	
Data Word Readed I2C 24LC256		0x155101xx	7	Ox01	0xFA	0xF4	ADD LOW	ADD HIGH	DATLOW	DAT HIGH	
Action I2C OK 24LC256		0x155201xx	3	0x01	0xFA	0xF1	ADDION	ADDITIGH	DATEOW	UNI HIGH	
Action I2C NOT OK 24LC256		0x155201xx	3	0x01	OXFA	DxF3		2			
ACIDITIZE NOT ON 24EG236	I A	UK 1552U TAK	3	UXUI	UAFA	UKFO			0.00		
Action	Dir	Ident	Length	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
			_	-	-		•	,	Dyte 5	Dyle 6	Dyte /
Set PWM Output (MAX-2047)	Rx	0x155101xx	5	0x01	0x41 0x45	CHANN	PWM0	PWM1			
RESET ALL Analog Outs	Fox	0x155101xx	3	0x01		0x00	CULANDI	PWM0	PWM1		
New Set PWM Output MAX=2047	Rx	0x155101xx 0x155201xx	6	0x01 0x01	0x45 0x45	0x01 0x01	CHANN	PVVMU	PWW1		
Analog OUT OK	Tx Fx		3	0x01	0x45	0x03	CHANN	LOWD	LOW1		
Set Low Level Out Calibration		0x155101xx 0x155101xx	6								
Set SPAN Analog Out Calibration ASK Analog Out Status	Rx Rx	0x155101xx	- 6 - 3	0x01 0x01	0x45 0x45	0x04 0x02	CHANN	CALO	CAL1		
	-	0x155201xx	7	0x01	0x45	0x10	AN00L	AN00H	AN01L	AN01H	-
BLOCKO Analog Out Status BLOCK1 Analog Out Status		0x155201xx	7	0x01	0x45	0x10	AN02L	AN00H AN02H	AND3L	AN03H	
BLOCK2 Analog Out Status		0x155201xx	7	0x01	0x45						8
		UK 1002UTAK							ANDEL	ANIDELL	
	TV	Dv155201vv	7			0x12	AND4L AND61	AN04H AN06H	AND5L AND7I	AN05H AN07H	
BLOCK3 Analog Out Status	Tx	0x155201xx	7	0x01	0x45	0x12 0x13	AND6L	AN04H AN06H	AN05L AN07L	AN05H AN07H	
				0x01	0x45	0x13	AN06L	AN06H	AN07L	AN07H	Ruto 7
Action	Dir	Ident	Length	0x01 Byte 0	0x45 Byte 1	0x13 Byte 2					Byte 7
Action Ask Analogic Inputs Enables	Dir Rx	Ident 0x155101xx	Length 3	Ox01 Byte 0 0x01	0x45 Byte 1 0x40	0x13 Byte 2 0x01	AN06L Byte 3	AND6H Byte 4	AN07L	AN07H	Byte 7
Action Ask Analogic Inputs Enables Analogic Inputs Enables Status	Dir Fox Tx	Ox155101xx Ox155201xx	Length 3 5	0x01 Byte 0 0x01 0x01	0x45 Byte 1 0x40 0x40	0x13 Byte 2 0x01 0x01	Byte 3 ENA0	Byte 4 ENA1	AN07L Byte 5	AN07H	Byte 7
Action Ask Analogic Inputs Enables Analogic Inputs Enables Status Enable Analogic Input Channels	Dir Rx Tx Rx	Ident 0x155101xx 0x155201xx 0x155101xx	Length 3 5	0x01  Byte 0  0x01  0x01  0x01	0x45 Byte 1 0x40 0x40 0x40	0x13 Byte 2 0x01 0x01 0x02	Byte 3  ENAD ENAD	AND6H Byte 4	AN07L	AN07H	Byte 7
Action Ask Analogic Inputs Enables Analogic Inputs Enables Status Enable Analogic Input Channels Ask Analog Input Value	Dir Rx Tx Rx Rx	0x155101xx 0x155201xx 0x155201xx 0x155101xx 0x155101xx	Length 3 5 6	0x01  Byte 0  0x01  0x01  0x01  0x01  0x01	0x45 Byte 1 0x40 0x40 0x40 0x40	0x13 Byte 2 0x01 0x01 0x02 0x02	Byte 3  ENAD ENAD CHANN	AN06H Byte 4 ENA1 ENA1	AN07L Byte 5 AutoSend	AN07H	Byte 7
Action Ask Analogic Inputs Enables Analogic Inputs Enables Status Enable Analogic Input Channels Ask Analogi Input Value Analog Input Value	Dir FX FX FX FX FX	0x155101xx 0x155201xx 0x155101xx 0x155101xx 0x155101xx 0x155201xx	Length 3 5 6 4 6	0x01  Byte 0  0x01  0x01  0x01  0x01  0x01  0x01	0x45 Byte 1 0x40 0x40 0x40 0x40 0x40	0x13  Byte 2  0x01  0x01  0x02  0x03  0x03	Byte 3  ENAD ENAD CHANN CHANN	Byte 4 ENA1	AN07L Byte 5	AN07H	Byte 7
Action Ask Analogic Inputs Enables Analogic Inputs Enables Status Enable Analogic Input Channels Ask Analog Input Value Analog Input readed (MAX-2047 Start Analog Input Calibration	Dir Rx Tx Rx Rx Tx	0x155101xx 0x155201xx 0x155201xx 0x155101xx 0x155101xx 0x155201xx 0x155101xx	Length 3 5 6 4 6 4	0x01  Byte 0  0x01  0x01  0x01  0x01  0x01  0x01  0x01	0x45  Byte 1 0x40 0x40 0x40 0x40 0x40 0x40 0x40 0x4	0x13  Byte 2  0x01  0x01  0x02  0x03  0x03  0x04	Byte 3  ENAD ENAD CHANN CHANN CHANN	AN06H Byte 4 ENA1 ENA1	AN07L Byte 5 AutoSend	AN07H	Byte 7
Action Ask Analogic Inputs Enables Analogic Inputs Enables Status Enable Analogic Input Channels Ask Analog Input Value Analog Input readed (IMAX-2047 Start Analog Input Calibration Abort Analog Input Calibration	Dir FX FX FX FX FX	0x155101xx 0x155201xx 0x155101xx 0x155101xx 0x155101xx 0x155201xx	Length 3 5 6 4 6	0x01  Byte 0  0x01  0x01  0x01  0x01  0x01  0x01	0x45 Byte 1 0x40 0x40 0x40 0x40 0x40	0x13  Byte 2  0x01  0x01  0x02  0x03  0x03	Byte 3  ENAD ENAD CHANN CHANN	AN06H Byte 4 ENA1 ENA1	AN07L Byte 5 AutoSend	AN07H	Byte 7
Action Ask Analogic Inputs Enables Analogic Inputs Enables Status Enable Analogic Input Channels Ask Analog Input Value Analog Input Value Analog Input Calibration Stort Analog Input Calibration Store Analog Input Calibration	Dir Rx Tx Rx Rx Tx Rx Rx Rx	Ident 0x155101xx 0x155201xx 0x155101xx 0x155101xx 0x155101xx 0x155101xx 0x155101xx 0x155101xx 0x155101xx	Length 3 5 6 4 6 4 4 4 4	0x01  Byte 0  0x01	0x45  Byte 1 0x40 0x40 0x40 0x40 0x40 0x40 0x40 0x4	0x13  Byte 2 0x01 0x01 0x02 0x03 0x03 0x04 0x05 0x06	ENAD ENAD ENAD CHANN CHANN CHANN CHANN CHANN	Byte 4  ENA1 ENA1 ADCO	AN07L  Byte 5  AutoSend  ADC1	AN07H	Byte 7
Action Ask Analogic Inputs Enables Analogic Inputs Enables Status Enable Analogic Input Channels Ask Analog Input Value Analog Input readed (IMAX-2047 Start Analog Input Calibration Abort Analog Input Calibration	Dir Rx Tx Rx Rx Tx Rx	Ident 0x155101xx 0x155101xx 0x155201xx 0x155101xx 0x155101xx 0x155201xx 0x155101xx 0x155101xx	Length 3 5 6 4 6 4 4 4	0x01  Byte 0  0x01  0x01  0x01  0x01  0x01  0x01  0x01  0x01  0x01	0x45  Byte 1 0x40 0x40 0x40 0x40 0x40 0x40 0x40 0x4	0x13  Byte 2 0x01 0x01 0x01 0x02 0x03 0x03 0x04 0x05	Byte 3  ENAD ENAD CHANN CHANN CHANN CHANN	AN06H Byte 4 ENA1 ENA1	AN07L Byte 5 AutoSend	AN07H	Byte 7
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Action  Ask Analogic Inputs Enables  Analogic Input Enables Status  Enable Analogic Input Chamnels  Ask Analog Input Value  Analog Input Calibration  Start Analog Input Calibration  Store Analog Input Calibration  Store Analog Input Calibration  Store Analog Input Calibration  Action  Action  ASK ALL Encoders  Encoder Value Readed  ASK Encoders Enables Status  Enable Encoders Channels  Start Encoders  Encoders  Enable Encoders	Dir Rx TX Rx Rx Rx Rx Rx Rx Rx Rx Rx Rx Rx Rx Rx	Ident  Dx155101xx	Length 3 5 6 4 4 6 6 4 4 4 5 6 Cength 5 8 3 4 4 4 4 4	0x01  Byte 0 0x01 0x01 0x01 0x01 0x01 0x01 0x01 0x	0x45  Byte 1 0x40 0x40 0x40 0x40 0x40 0x40 0x40 0x4	0x13  Byte 2 0x01 0x01 0x01 0x01 0x02 0x03 0x03 0x03 0x04 0x05 0x06 0x07  Byte 2 0x01 0x01 0x02 0x02 0x02 0x03	ANOGL  Byte 3  ENAO ENAO CHANN CHANN CHANN CHANN CHANN CHANN CHANN CHANN ENCS ENCS ENCS ENCS ENCS ENCS ENCS	AN06H  Byte 4  ENA1  ENA1  ADC0  CAL0  Byte 4  AutoSend	AN07L  Byte 5  AutoSend  ADC1  CAL1  Byte 5	AN07H  Byte 6  Byte 6	Byte 7
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Action  Ask Analogic Inputs Enables  Analogic Input Channels  Ask Analogic Input Channels  Ask Analog Input Value  Analog Input Value  Analog Input Calibration  Start Analog Input Calibration  Store Analog Input Calibration  Store Analog Input Calibration  Store Analog Input Calibration  Action  Action  ASK ALL Encoders  Encoder Value Readed  ASK Encoders Enables  Encoders Enables Status  Enable Encoders Channels  Start Encoders  Stap Encoders  Reset Encoders  Action  ASK One Input  One Input Status  All Inputs Status	Dir Rx	Ident	Length 3 5 6 4 4 4 4 6 6 Length 5 8 3 4 4 4 4 4 4 4 4 Length 3 3 6 6	0x01  Byte 0 0x01 0x01 0x01 0x01 0x01 0x01 0x01 0x	Dx45  Byte 1  0x40 0x40 0x40 0x40 0x40 0x40 0x40 0x	0x13  Byte 2 0x01 0x01 0x01 0x01 0x03 0x03 0x03 0x03	ANOGL  Byte 3  ENAO ENAO ENAO CHANN CHANN CHANN CHANN CHANN CHANN CHANN CHANN CHANN ENCS ENCS ENCS ENCS ENCS ENCS ENCS EN	AN06H  Byte 4  ENA1  ENA1  AD00  CAL0  Byte 4  AutoSend  VAL0  Byte 4	AN07L  Byte 5  AutoSend  ADC1  CAL1  Byte 5  VAL1  Byte 5	Byte 6  VAL2  Byte 6	Byte 7 VAL3 Byte 7
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Action  Ask Analogic Inputs Enables  Analogic Input Senables Status  Enable Analogic Input Channels  Ask Analog Input Value  Analog Input Calibration  Start Analog Input Calibration  Store Analog Input Calibration  Store Analog Input Calibration  Span Analog Input Calibration  Action  Action  ASK ALL Encoders  Encoder Value Readed  ASK Encoders Enables  Encoders Enables Status  Enable Encoders Channels  Start Encoders  Start Encoders  Reset Encoders  Action  ASK One Input  Action  ASK ALL Inputs Status  All Inputs Status  Action  Set SimEnc 0 Output CW	Dir TX RX RX RX RX RX RX RX RX RX R	Ident	Length 3 5 6 4 4 4 4 6 6 Length 5 8 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 5 Length 7 7 7 7	0x01  Byte 0 0x01 0x01 0x01 0x01 0x01 0x01 0x01 0x	Dx45  Byte 1  0x40 0x40 0x40 0x40 0x40 0x40 0x40 0x	0x13  Byte 2 0x01 0x01 0x01 0x01 0x03 0x03 0x03 0x04 0x05 0x06 0x07  Byte 2 0x01 0x02 0x02 0x03 0x03 0x06 0x07  Byte 2 0x01 0x02 0x02 0x02 0x03 0x05 0x04	ANOGL  Byte 3  ENAO ENAO ENAO CHANN	AN06H  Byte 4  ENA1  ENA1  AD00  CAL0  Byte 4  AutoSend  VAL0  Byte 4  inputs 2  Byte 4  TiM1  TiM1	ANO7L  Byte 5  AutoSend  ADC1  CAL1  Byte 5  VAL1  Byte 5  Inputs 3  Byte 5  CNTD	Byte 6  VAL2  Byte 6  VAL2  Byte 6  CNT1  CNT1	Byte 7 VAL3 Byte 7
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## 4. Install / Uninstall YAV boards into / from a VPC Receiver

YAV boards are using a high reliable professional receiver connectors from VPC (Virginia Panel Corporation). It is crucial for all modules to be installed properly in the Receiver.



Following pictures are showing the sequence for mounting a YAV board into a VPC receiver. The boards are comming with Allen screws that will fit into receiver positions. 3/32 Allen Wrench is needed to screw the board into the receiver. Screw both sides evenly.





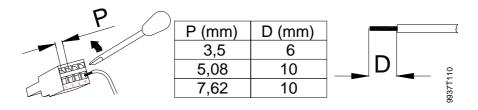


For uninstalling the boards, unscrew and hold the board with two hands from both sides and pull straight out.

## 4.1 Conections

## 4.1.1 Connecting cables into YAV board terminals

Following table is to show the distance (D) at what we have to cut the isolation to connect a cable into the aerial clamp terminal that connects unto X1 of the YAV board.





# 5. Getting started with your YAV board

### 5.1 NI CAN board

To control the YAV board you will need a CAN interface. We recomend using NI-CAN, from National Instruments.

# 5.2 CAN bus wiring

- We need to supply CAN-H, CAN-L, +24Vdc and GND to X1 connector of the YAV board.

X1 connector of YAV board				
Pin	Function			
1	0V			
2	+24Vdc			
3	CAN_Low			
4	CAN_High			

 OV from NI-CAN and from YAV must be joined toghether in no galvanic isolation in the YAV.

### 5.3 PHI6-EXPLORER

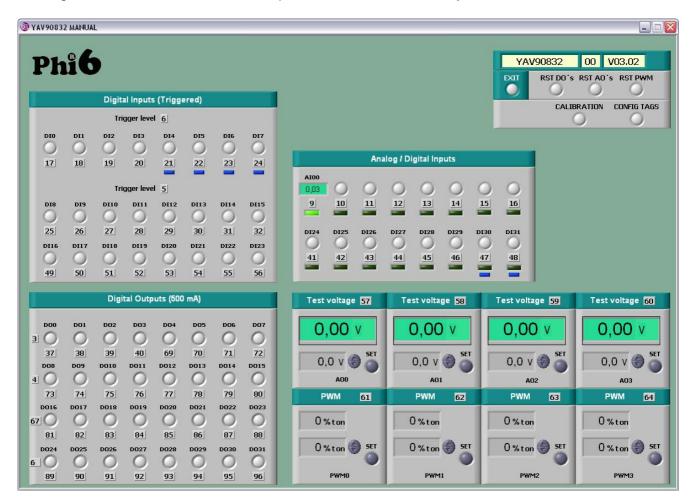
 Install the Software PHI6-EXPLORER to manually control the board. Refer to PHI-6 software manual, our reference 680020Ex.

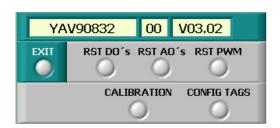


# 6. Operating the board manually with PHI6-EXPLORER

### 6.1.1 Operator Panel for YAV9832

Through PHI6-EXPLORER we can operate the board manually:



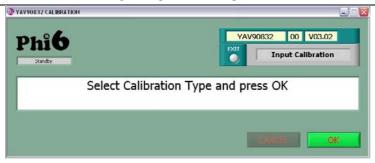


This box in the Operator Panel displays the module name: YAV90832 as well as the adress configured in the YAV board (SW1) and the firmware versión of the board.

**RST DO's**, **RST AO's** and **RST PWM** buttons will RESET respectively DO's, AO's and the PWM.

The CALIBRATION button will open the following window:

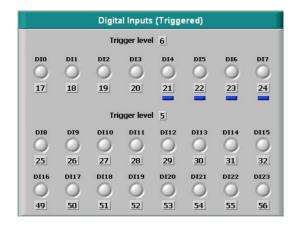




By following the instructions given by the display, we can go through all analog inputs and outputs and calibrate them.

### **CONFIG TAGS** button

From Phi6 Explorer we can easily edit the tag names of each channel, in order that when implementing your test executive sequence, it will be easier to recongnize the resources. Click the 'Config Tags' button at the top right side. Then an alias name for the board and a tag for each channel can be added. After making all changes click the Save Tags button to reflect the changes and the product configuration file will be automatically edited.





### **Digital Inputs**

There are two Banks. First bank has 8 DI with the voltage level to change the logic level in pin number 6. The second bank, with 16 DI's, has the voltage level that defines the status of the input in pin number 5.

DI's from 21 to 24 can be either DI's or encoder inputs.

Pin 21: Encoder 2, channel B Pin 22: Encoder 3, channel A Pin 23: Encoder 2, channel A Pin 24: Encoder 1, channel A

### **Analog / Digital Inputs**

From 9 to 16, we have a bank of Analog inputs.

From 41 to 48, the inputs can be either DI or AI. When actuating as DI, the voltage level for having a logic 1 is  $8,75V \pm 10\%$ .

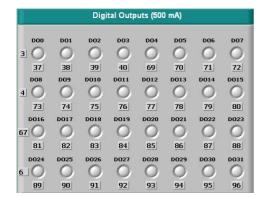
By pushing the green led below the pin number, the voltage read out of the channel will appear.

Pins 47 and 48 are, more over, Encoder channels:

Pin 47: Encoder 3, channel B Pin 48: Encoder 1, channel B

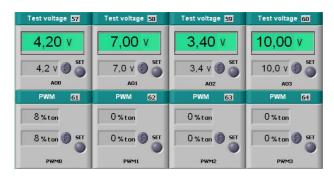






### **Digital Outputs**

There are four MOSFET DO Banks. Each one allows a different common voltage. These outputs are switching from 0 to 1 at 10V



### **Analog outputs**

Each analog output has a display to show to the user the value that the board is giving. The operator can set the value by typing it in the box and pushing **SET**.

For each **PWM output**, we can select the duty cycle. One display is showing us the value that the output is giving, and the other one is for setting a new value.