DATA SHEET

CYBELEC
INFRANOR GROUP COMPANY

Numerical control

ModEva RA Premium

ModEva RA Premium is designed to control high-end synchronized press brakes with up to 18 axes, of which 2 can be synchronized hydraulic axes.

ModEva RA Premium is composed of 2 main elements:

- A programming console with a large touchscreen and a traditional keypad, operating with full 3D simulation software, located within the operator's reach, generally fixed to a swiveling arm.
- A CNC rack, placed inside the electric cabinet.

ModEva RA Premium system software gives manufacturers the ability to configure axes, inputs/outputs and auxiliary functions according to their needs.

As a member of the ModEva family, ModEva RA Premium's hardware is compatible with other ModEva numerical controls: same wiring, same signals, same electronic interface, same commissioning procedures.

To work with programs prepared on older machines, the latest evolution of the classic ModEva interface is still accessible.

ModEva RA Premium is sold bundled with two software licenses, allowing to install one of them on a PC to be able to prepare work in the office.

Software specifications

Part data management

- Direct programming.
- Extruded 2D profile.
- Import 3D MetaCAM, 3D IGES, DXF flat pattern formats.
- Export DXF flat pattern.
- Import/Export jobs in ModEva RA Premium format.
- Execute 3D, 2D and directly programmed jobs.
- Jobs can be organized in sub-directories with thumbnail images.
- Import 3D STEP files and SolidWorks native files (optional).

Tool lists and catalogs

- Parametric tools and tool holders.
- Transfer tools defined on other ModEva RA Premium machines or off-line.
- Display and use any free-profile tool in the inventory.
- Tool catalogs, with possibility to have more than one active.
- Multiple tool grip types (valencies).
- Explicit treatment of punch-holders and die-holders.

Automatic solution

- Find adequate tool profiles.
- User can suggest or enforce which tools to use.
- Find solutions for extruded 2D profiles, for (transferred) generic 3D parts, for step bending, for hemming (punch- or die-hemming), with slanted or out-of-axis gauging, for jobs requiring multiple tool setups.
- Check if tool segments fit, compute segmentation.
- Bend deduction: K-based, empirical table or user's entry.

3D scenes display

- 3D machine and part models.
- Selectable display of machine components.
- Selectable points of view.
- Rotate , Pan and Zoom with touch-screen or buttons.

ModEva RA Premium needs 3D models for the machine and the back-gauge fingers. These models can be quickly and easily prepared with an external software tool named BMC Designer, by filling in a number of predefined parameters. More sophisticated, non-parametric models can be specially prepared using MetaCAM, by Metamation.

Edit environment

- Video-like 3D bend simulation.
- Still-image-only 3D bend simulation.
- User can change bending sequence, gauging and tooling.
- User can insert directly programmed operations.
- Step bend: change number of steps.

Run environment: setup sheet

- Jogs, manual moves.
- Drawing of part before/after.
- Tool station position and width.
- Tool station segmentation.
- Count produced parts.

Run environment: running, correcting

- Auto/Semi-Auto selector.
- Correction of BDC and crowning after measuring 1, 2 or 3 angles.
- Connection to digital angle protractor (RS232 or USB+IRF).
- Direct corrections of any axis.
- Modifying cycle properties (TDC, PP, speed, force, etc.).
- Thickness variation measure: thick sheet, manual or die-displacer.

Axis and bending functions

The elements listed hereafter are available and can be configured in all numerical controls supplied with standard software (within the number of axes and inputs/outputs available).

Standard axes

- Y1 - Y2 : Synchronized axes for the beam (servo-valves, proportional valves). If a current output is needed, the MSV 402 (see Machine options) becomes necessary.
- X, X1, X2, X5, X6 : Main back gauge axes.
- X1 ABS, X2 REL : Secondary back gauge axes in absolute or relative mode, generally used for motorized finger gauge.
- Z, Z2, Z5, Z6 : Axes for left/right movement of the back gauge. Possibility to program a position clearing movement (“retraction”) in Z-axis for faster bending cycles.
- R, R2, R5, R6 : Back gauge height-adjustment axes.
- X5, X6, R5, R6, Z5, Z6 : Additional back gauge axes as directly programmable axes (no 3D treatment, no collision checking).

Conical folds

Programming of conical folds (requires X, X2 and adapted stop fingers).

Pressure

Voltage output for pressure valve control. Current output available with MVP 100 valve current amplifier (see Machine options).

Dynamic crowning

Voltage output 0-10 VDC to adjust the hydraulic crowning. Dynamic correction of the bending table, the beam and axis R position. Calculated not only in relation with force, but also with sheet width. If current control is desired, the MVP 100 (see Machine options) is the solution.

Angle measurement

- Angle correction after bend: measurement of the bend using the angle protractor. The value is transmitted via wireless or serial link to the NC, and automatically generates the correction.
- Angle correction during bending process: interfacing of a DataM external measuring system, or any other proprietary solutions.

Auxiliary functions

Configurable auxiliary functions (number eventually limited according to the type of function and management). 24 VDC voltage or logical order outputs, with or without position control by means of a potentiometer transducer. Special controls for gauge fingers.

Free axes

Independent axes to be attributed to particular functions (no 3D treatment).

Lazer Safe PCSS interface

Allows selecting the safety mode, and checking the Lazer Safe’s PCSS status and log file.

Software options

Special axes

- H1, H2 : rear sheet support axes (not calculated).
- H3, H4 : calculated front sheet support axes (no collision management).

Tandem operation

Management of 2 or more press brakes coupled together in order to bend sheets too long to be bent with one press.

Import 3D files

Importation of 3D files in the STEP format and also in the native SolidWorks format.

Message interpreter

Allows remote control of the NC with commands sent in a file via Network or RS232. Generally used for interfacing with robots, bar code readers, etc.

Bending aids

Management of conventional bending aids, or of simplified mechanic bending aids with 2 axes (AP and H) interpolated with the beam.

CNC Hardware specifications

The CNC is available in 3 rack sizes depending on the configuration:

CNC/C

Compact rack version. Allows controlling 2, 4 or 6 axes, and up to 10 axes with NCX CANopen axis controller board (Y1, Y2 and 8 electrical axes).

CNC/M

Medium rack version. Allows controlling 4, 6, 8, 10, 12 or 14 axes, and up to 18 axes with NCX CANopen axis controller board (Y1, Y2 and 8 electrical axes).

CNC/L

Large rack version. A specially large rack version available upon request.

Definitions

Hydraulic axes – NPU board

Analog axes especially intended for controlling the beams (Y1-Y2), controlled by the NPU board.

Analog axes – NMX/NSX boards

NMX master board can control 2 analog axes, and up to 3 NSX slave boards, each of which being able to control 2 additional analog axes. Speed command is provided to the axis drive in the form of a ±10VDC voltage and some digital signals. Axis position is provided to the NMX/NSX board by an incremental encoder as a quadrature signal.

CANopen axes – NCX board

An NCX board can control up to 8 axes depending on the options. It provides motion commands and receives position information from the axis drives via a CAN bus abiding to CANOpen conventions. This board can handle various protocols according to the type of servo-amplifier used. It is possible to combine NCX and NMX/NSX boards, in order to combine CANopen and analog axes. ModEva RA Premium accepts up to 2 NCX boards.

Please contact Cybelec before ordering if you consider CAN for your axes.

CNC Axes Configuration

Rack version	C (Compact)		M (Medium)					
No. of axis boards	2		5					
Axis position (slot N°)	0	1	0	1	2	3	4	5
Most common configurations	NMX	-	NMX	NSX	NSX			
	NMX	NSX	NMX	NSX	NSX	NSX		
	NMX	NLR	NMX	NSX	NSX	NLR		
	NCX	-	NMX	NSX	NSX	NLR	NMX	
	NCX	NLR	NCX	NLR			NMX	NSX

Technical Characteristics - Console

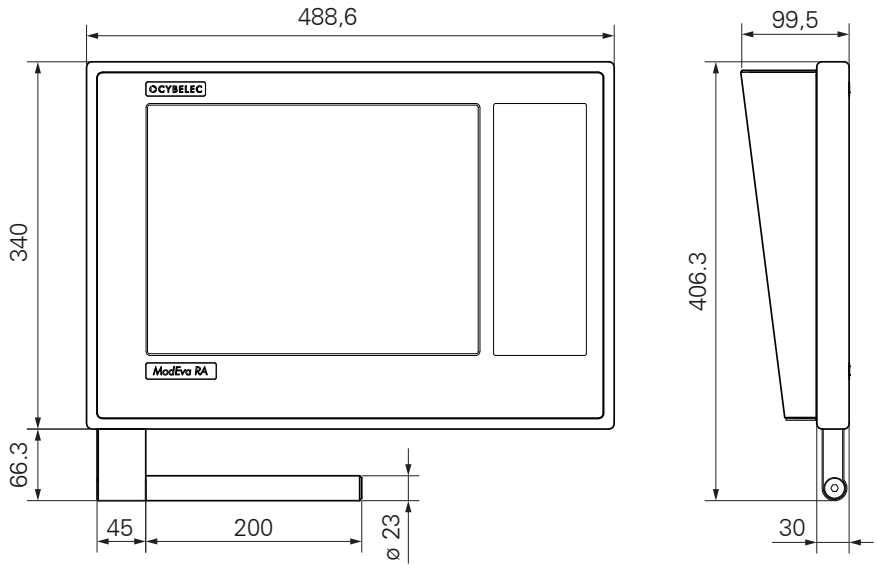
Screen	15" TFT
Keypad	41 keys
Resolution	1024x768
Touch screen	Yes
USB port	1 x USB 2.0
Power	Through the panel link
Seal	IP 54
P-Link	2 cables RJ45 twisted pair category 6. Cables 5 m or 10 m with Cybelec repeater.
Handle	Included
Operating conditions	Min. 5° Celsius, max. 40° Celsius. Relative humidity 10 to 85% non-condensing. If the ambient temperature approaches or exceeds 40° Celsius, it is advisable to install special ventilation.
EC Directives	EC61131-2 type 1-3
Available languages	English, Français, Deutsch, Italiano, Český, Türkçe, 中文, 台灣, Español, Hrvatsko, Dansk, Magyar, Polski, Русский, Slovensko. Language translation modifiable by manufacturer or end-user.

Technical Characteristics - CNC

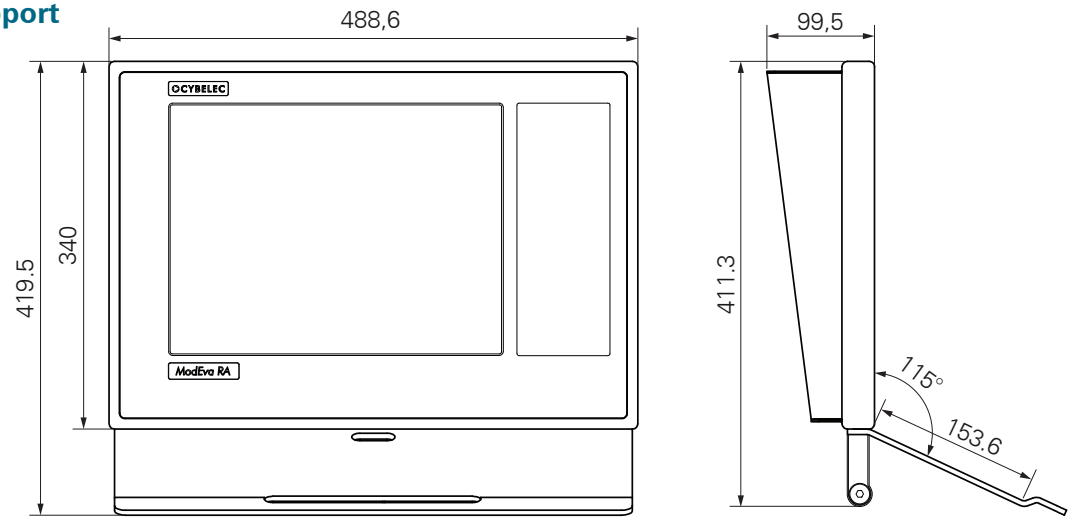
System	Windows© XP Pro Compact	
CPU	AMD Fusion T40R – 1GHz	
RAM	2 GB	
Disk	16 GB flash	
Communication	• 2 RS232 – 1 configurable, e.g. for Lazer Safe's protection devices • 2 PS/2 for mouse or keyboard input • 1 RJ45 Ethernet for network • 1 parallel port (printer) • 1 STD VGA Screen output	
Serial port for PLC	Yes, on NPU board. RS232 configurable to RS422 (Pilz).	
Y1, Y2	NPU board	
Analog axes	2 per board	NMX, NSX boards, according to configuration and rack version. Z_{out} output impedance < 100 Ω , Z_i load ≥ 10 kΩ
CAN axes	NCX boards	Depending on configuration and rack version.
Incremental encoders	5V DC	Line driver, complementary signals are mandatory.
Digital inputs	32	NIN boards, 24 VDC opto-coupled.
Digital outputs	32	NOT boards, 24 VDC "sources". Max 2.5 A / output (NOT 204). Max 6 A / board.
Analog inputs	6	NIN boards. Depending on configuration 0-10, 0-24 VDC A/D 8 bits.
Analog outputs	4	NOT boards, 0-10 VDC (8 bits) for the auxiliary functions, Z_{out} output impedance < 100 Ω , Z_i load ≥ 10 kΩ
Power supply	24 VDC / max 4A ± 15%.	
Seal	Must be installed in an approved electric cabinet.	
Operating conditions	Min. 5° Celsius, max. 40° Celsius. Relative humidity 10 to 85% non-condensing. If the ambient temperature approaches or exceeds 40° Celsius, it is advisable to install special ventilation, or even air-conditioning.	
EC Directives	IEC61131-2	
Weight	Rack version C:	approx. 5 kg.
	Rack version M:	approx. 6 kg. Depending on equipment.
	Rack version L:	approx. 7 kg. Depending on equipment.

Dimensions

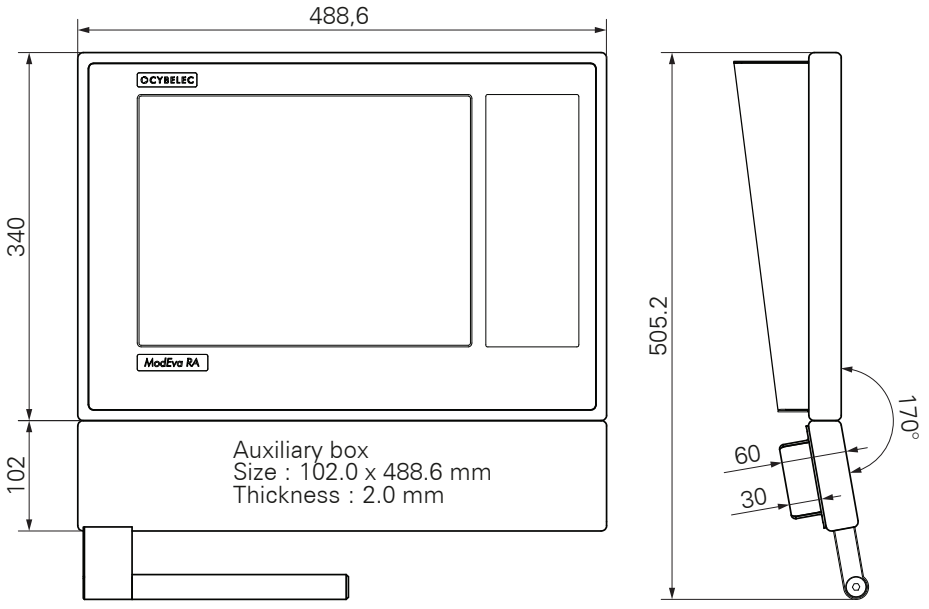
Console alone



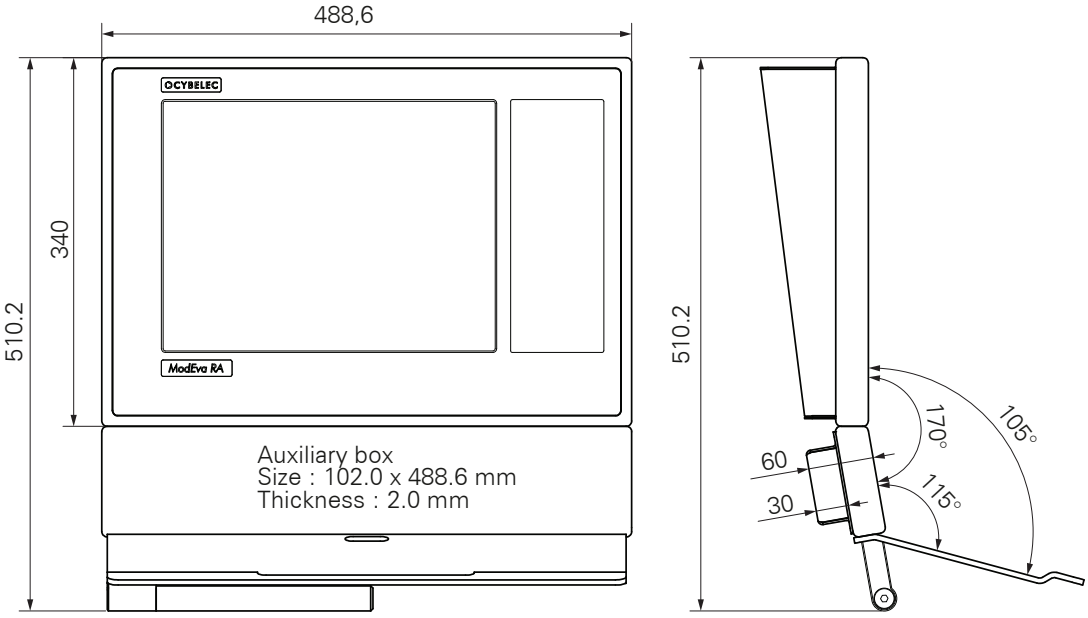
With keyboard support



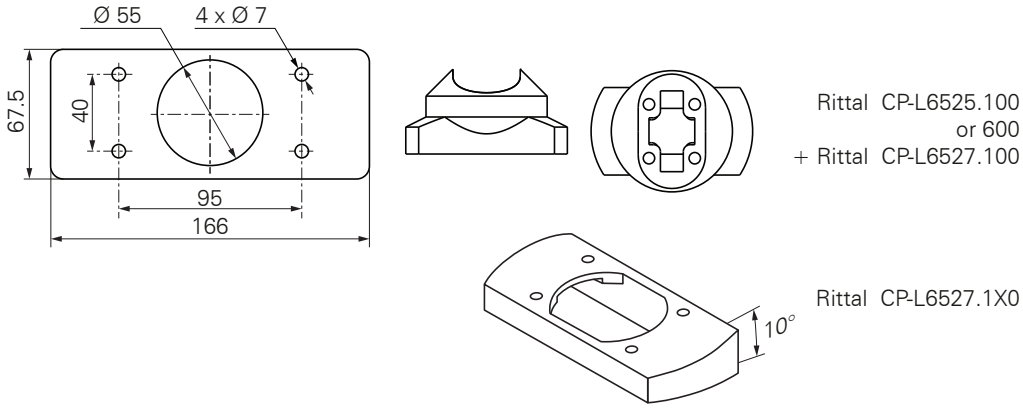
With auxiliary box



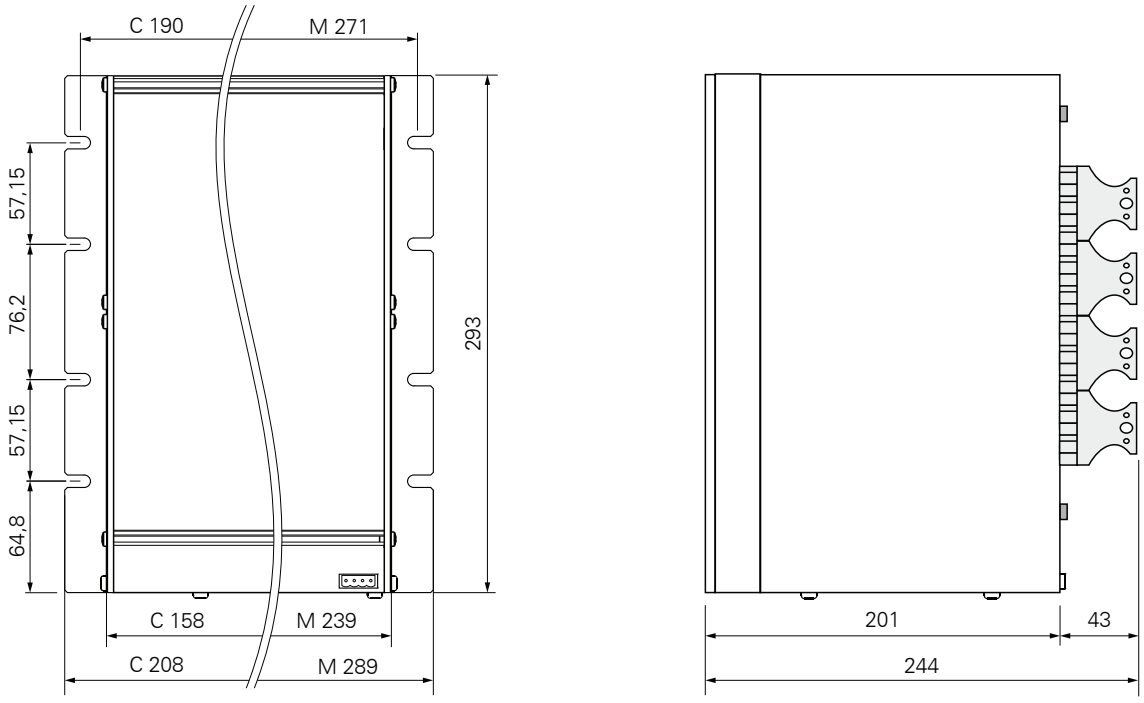
With auxiliary box and keyboard support



Attachments



Rack dimensions



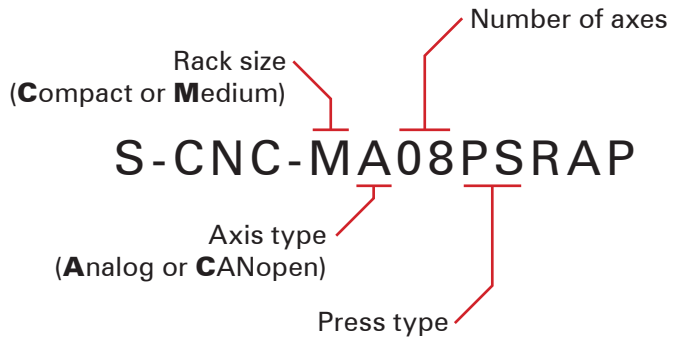
Software options

S-OFT-OPT08	Message interpreter
S-OFT-OPT30	Angle measurement 2 points analog interface (NLR board)
S-OFT-OPT38	Rear axes H1 and H2 (sheet support)
S-OFT-OPT42	Conventional bending aids, AP1 to AP4
S-OFT-OPT52	Front axes H3 and H4
S-OFT-OPT60	Angle measurement – one measuring station
S-OFT-OPT65	Angle measurement – two measuring stations
S-OFT-OPT66	Angle measurement by RS in continuous mode (NLR board)
S-OFT-OPT74, 75, 76, 78	CANOpen axis drives (BUS 2, 4, 8, 16 axes)
S-OFT-OPT86	Thickness variation compensation: strain gauge
S-OFT-OPT89	Tandem management
S-OFT-OPT90	Combined bending aids and sheet supports (H+AP, etc…)
S-OFT-OPT91	Slave axes

Machine options

S-OPT-BTAUX-S/E	Auxiliary panel for machine buttons
S-OPT-KBSUP15	Support for external USB keyboard (the keyboard is not provided)
S-OPT-EARTHKITC	Earthing kit for size C rack
S-OPT-EARTHKITM	Earthing kit for size M rack
S-CAH-CybVA6	Interface card for Hoerbiger proportional valves
S-MVP-100/A	Voltage / current conversion module (0-10V → 0.25-0.5 / 0-2 A) for pressure and crowning valves, to be fitted in the electric cabinet.
S-MSV-402/A	Voltage / current conversion module (±10V → ±50 mA, ±300 mA) for servo-valves.
S-OPT-PLCABLE15	Cable, length 15 m with amplifier
S-OFT-RAP	Additional off-line software PC-RA Premium on a USB protection key

Ordering Information



Console

S-MOD-RA

Examples

S-CNC-CA06PSRAP
S-CNC-MA08PSRAP
S-CNC-CC08PSRAP

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