Messrs: _____

<u>For increasing operation rate by 10%</u>

> # The brief guide to 「Bendmaster」
> # The software for managing
> # multiple benders by one PC

Opton Co.,Ltd.

Ver. 1

1．The total information can be centralized to refer on on-going operation status of all operating machines.

・By interfacing all Opton machines on the production floor to the PC with 「Bendmaster」 installed, real-time check can be made on the comprehensive production status of an individual production machine including an on-going production part number.

2．Easy and timely issuing of production instruction

Production instruction can be issued to an individual bender.

・The signal for "production completed" is issued upon the end of assigned production by the "Opton" machine.

Idle status of an individual production machine can be found in an remote office, enabling to issue a prompt production instruction for idle-less machining operation.
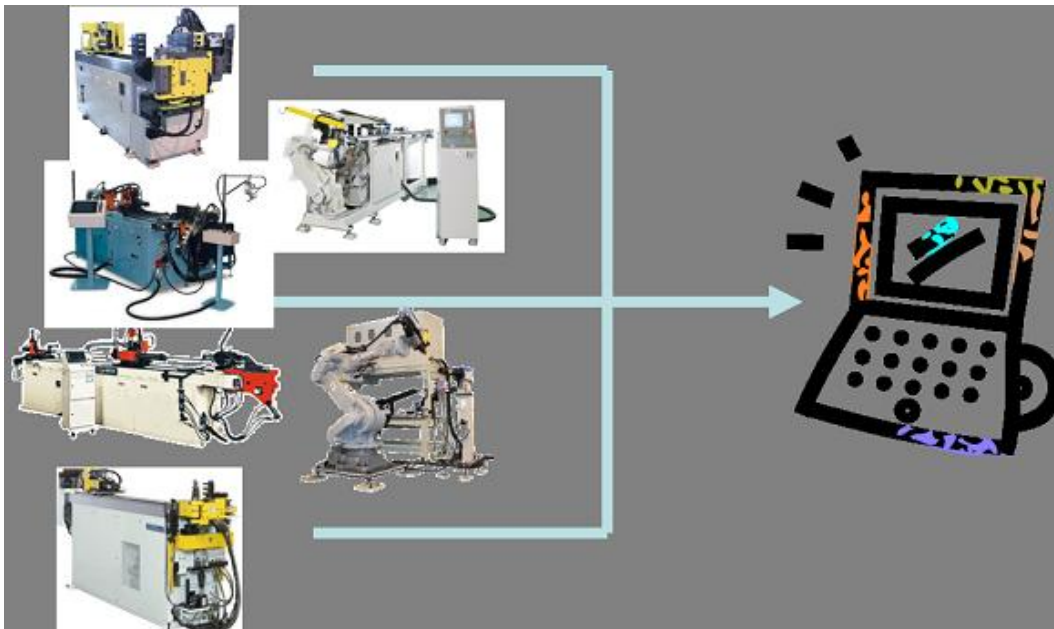
3．Collective and instructive management of production data can be made by one PC for multiple number of Opton benders on line with this 「Bendmaster」．

① One 「Bendmaster」 is enough.

・Unlike the old fashioned production data management where the data needs be installed and saved in an individual machine, the remarkable power of the 「Bendmaster」 installed PC offers the collective data storage and management the PC for all on-lined Opton benders, regardless of old or new， including those for the optimized PRB data of quality-proved work, XYZ coordination data and 3-dimmensional data

XYZ Coordinate data

Bend point	Radius	X-Y-Z in coordinate		Absolute coordinate
0	1	4218.50	−403.85	1125.00
1	2	4178.00	−317.77	1127.19
2	3	3965.00	−284.00	1242.00
3	1	3788.90	−361.08	1066.00
4	1	3750.00	−431.00	1066.00
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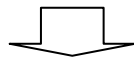
Bending data converted from XYZ coordinate data

工程番号	半径	送り	SP	ひねり	SP	曲げ	SP	曲げ戻り	SP
1 −	0	2	0.00	1	0.00	1	59.54	1	
2 −	0	3	51.38	1	−82.29	1	76.65	1	
3 −	0	1	91.04	1	102.28	1	54.06	1	

3　曲
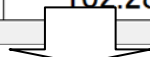
Bending data expressed in 3D
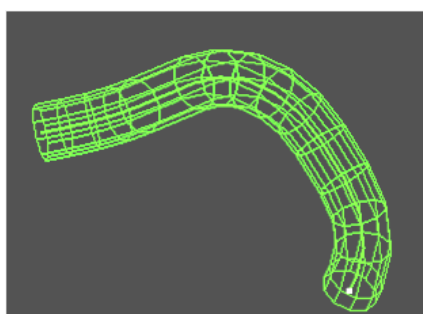
②The PC with 「Bendmaster」 in a remote office sends to an individual bender the production data, instruction of quantity to produce.

・The bending data once saved in the 「Bendmaster」 can be forwarded to other in-lined Opton bender, it thus requires no data creation for an individual bender.

4．「Bendmaster」 in capable of managing production, schedule and cost （By "Maximum" version）

①The PC in a remote office works for total management for operation rate, shipment, incoming order, unit price and schedule per each of all machines.

②Helpful functions include indication of machine running status, per-bend cost calculated from the machining tact time and/or total production cost.

③Production management also includes such as for order-incoming, material ordering, material incoming, man-hour control, inspection data control and shipping instruction as well.

④By cost data input for material, man-hour and other expenses, total cost management can be made.

5．「Bendmaster」- A strong tool for building up the factory-wide management center of pipe-working manufacturing technologies (Maximum version) in collaboration with other engines of 「Cloud」「MAT」「Accuracy monitoring」 and 「Tracer」

・With the powers described as in above, collective managements for production, inventory and cost can be established enabling to issue production order on line. The management can be further extended to monitoring/instruction of bending specifications, operation rate, tact time and job-achievement for an individual machine based on the total production requirement all for lean but effective production management.

６．Production data communication allowed with those of other brand benders.

・The production data for other brand machine can be transferred via memory media (cassette tape, floppy disk or USB memory) to Opton benders

・The bending data of other brand benders is converted to those in Opton machine format.

・Saving, display and searching are made of the bending data for other brand machines. They also can be put out in a memory media.

・Opton is pleased to prepare the quotation for these data handling upon Opton's receipt of the inquirer's bending data format

【Reference about [Quotation]】

① Bendmaster basic

（１） For uploading of the bending data from Opton bendeers：

MC type： For the model MC-series：

The data transfer is made as below；

The cassette tape with bending data is placed to upload the data in the batch system into the cassette reader on-line to the 「Bendmaster」. The bending data for one-day operation stored in the 「Bendmaster」 are up-loaded to the cassette tape to be handed to an operator

Upon installation of 「bendmaster」, it is necessary for the machine user to forwards the data-saved cassette Opton. Opton then follow upon discussion with the user the arrangement of the data for easier reference.

１－１ Retrofitting USB device on the machine for data communication

(A 1-board computer with USB in serial board is installed together with USB software.)

１－２ For down-loading of the bending data, it is needed to prepare the cassette device online to 「Bendmaster」 with which the full data for one-day operation is downloaded to the cassette. (the same applied to other brand model.)

（２）　For the model MC & MS

Communication I/F RS-232C is installed to the bender controller for bi-directional data communication between bender and　「Bendmaser」(Max wiring distance of 150M)

（３）　For the model ECO, EMO,MSO

Thanks to the serial ports built-in as standard, bi-directional communication can be made with no retrofitting required.

（４）　For new ECO and the renewal machine with the new controller

Thanks to the LAN ports built-in as standard, bi-directional communication can be made with no retrofitting required.

（５）For other brand benders

For taking up of the data, refer the article (1) above.

The data communication as per the article (1) 1-2

The product price to be quoted separately including the cost including for data-arrangement, communication set-up and annual maintenance fee

②「Bendmaster Exchange」

This version has following features included in addition to the standard version.

（１）　Self-correction of production data is executed by setting the Opton's non-contact profiler　「Cloudforma」series in the production line. The big advantages are expected in quick full production start, saving of material cost and human power.

（２）　Thanks to the capability of loading of the CAD data output in excel and CSV, the bending data can be created without depending on the coordination data, leading to quick creation of the bending data with no mistake in data entry. The bending data can be output in the format of excel and CSV, the data communication for collection, analysis and management can be made with remote PC with no「Bendmaster」software.

③「Bendmaster　Maximum」

（１）Opton quotation to follow for client custom specification requirement .

In starting feasibility study

For starting a study on Robot Bender series, followings are offered:
Please pick up any one below that most suites your initial interest.

1. Opton staff visit to an inquirer is offered to make detailed presentation on a PC.

2. Opton factory visit by an inquirer is most welcome where the demonstration is available of the 「Bendmaster」 working on line with opton benders.

3. Opton staff is pleased to make a visit to an inquirer for the best proposal upon Opton's receipt of inquirer's information covering the number of Opton benders to interface and requirement on retrofitting for the same of the benders currently at service.

Opton stays always ready to meet anyone above