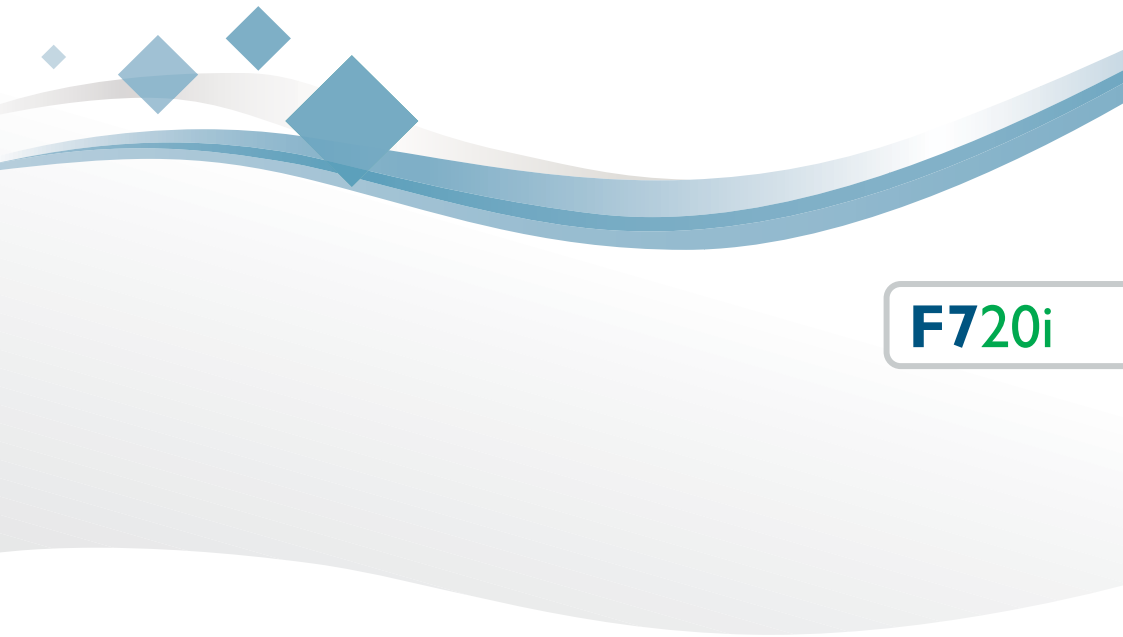




Domino F-Series User Documentation

A decorative graphic element consisting of a thick, wavy blue line that curves across the lower half of the page. Above this line, there are several blue diamonds of different sizes, some of which are partially overlapping the line.

F720i

Domino. Do more.

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- WARNINGS:**
- (1) As supplied, this coder is a class 4 laser product. During operation, it will emit up to 140 watts of pulsed invisible laser radiation at a wavelength between 1030 and 1120 nanometers. Avoid eye or skin exposure to direct or scattered radiation.
 - (2) The products contain embedded laser devices that emit invisible radiation in the region of 900 - 1000 nm with a total output power of up to 140W for the rated output power of the laser modules: this radiation is not accessible to the user unless the protective housing is opened.
 - (3) The products contain embedded laser devices that emit visible radiation in the region of 630 - 670 nm with a total output power of up to 5 mW for the rated output power of the laser modules.
 - (4) The laser may emit significantly higher powers under a single fault condition (<120 W 1030 – 1200 nm; <100 W 900 – 1000 nm).
 - (5) This coder must be fitted with class 1 laser safety guarding, to safeguard against accidental exposure to direct or scattered radiation before it is operated or made ready for use.
 - (6) Guidance on creating and fitting laser guarding can be found in part 1 of the Product Manual.
 - (7) Use of controls or adjustments of performance or procedures, other than those specified in this manual, may result in hazardous radiation exposure.

F-SERIES LASER CODER

WARNING: This is a Class 4 laser using high power invisible light. A risk of personal injury or damage to equipment may result if proper safety precautions are not observed. Reading and understanding this manual is required before operating this laser system.

This manual has been produced for use in the operation of the Domino F-Series Laser Coder and to reinforce and complement any training program available with the product. It is not designed to replace any such training program.

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Domino Printing Sciences plc has a policy of continuous product improvement. The Company, therefore, reserves the right to modify the specification contained in this manual without notice.

For sales and service assistance please visit the following website and select "Contact Domino in your country" for local technical support:

<http://www.domino-printing.com>

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- Notes: (1) *The English version of the manual is the original version. All other languages are translated from the English version.*
- (2) *This manual's intended use is for operators.*

CONTENTS OF THE EC DECLARATION OF CONFORMITY

(in accordance with ISO/IEC 17050-1)

No. Doc-0009424_R02

Issuer's name: Domino Laser GmbH, Germany

Issuer's Address: Fangdieckstrasse 75a, 22547 Hamburg / Germany

Object of the declaration:

F-Series laser marking system consisting of: Controller F720i (BCP7), Laser Head and optional TouchPanel.

The object of the declaration described above is in conformity with the requirements of the following documents:

EN 61000-6-2:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments.

EN 60825-1:2014 Safety of Laser Products.

EN 55011:2009/A 1:2010 Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement

EN 60950-1:2006/A2:2013 Safety of Information Technology Equipment.

EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

EN ISO 13849-1:2008 Safety of machinery - Safety related parts of control systems - Part 1

2014/35/EC: Low Voltage Directive

2014/30/EC: EMC Directive

2011/65/EU: RoHS2 Directive

Additional Information

Compliance is dependent upon installation and use in accordance with the Product Manual supplied.

CONTENTS OF THE EU DECLARATION OF INCORPORATION

(in accordance to the Directive 2006/42/EC on Machinery appendix II I.B for partly completed machines)

No.: EPT031053/1

Issuer's Name: Domino Laser GmbH

Issuer's Address: Fangdieckstrasse 75a, 22547 Hamburg, Germany

Person authorised to compile the relevant technical documentation, who must be established in the Community:

Research & Development Department, Domino Laser GmbH

Object of the declaration:

F-Series laser marking system consisting of: Controller F220i (BCP7), Laser Head and optional TouchPanel.

The special technical documents corresponding to the machine have been created according to Appendix VII, part B.

It is expressly stated that the partly completed machine fulfills all the relevant provisions of the following EC directives.

2006/42/EU	Directive 2006/42/EC of the European parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)
2014/35/EU	Directive 2006/95/EC of the European parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits
2014/30/EU	Directive 2004/108/EC of the European parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC
2011/65/EU	Directive 2011/65/EU of the European parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast)

Published applied harmonized standards according to Article 7 (2)

EN 60204-1:2006-06	Safety of machinery - Electrical equipment of machines. Part 1: General requirements.
EN 61000-6-2:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments.

EN 60825-1:2014	Safety of Laser Products.
EN 55011 :2009/ A1:2010	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
EN 60950-1:2006/ A2:2013	Safety of Information Technology Equipment.
EN 61326-1:2013	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
EN ISO 13849- 1:2008	Safety of machinery - Safety related parts of control systems - Part 1

Published other applied technical standards and specifications

ÖNORM EN ISO 11252 2013 -12-01	Lasers and laser-related equipment - Laser device - Minimum requirements for documentation (ISO 11252:2013); German version EN ISO 11252:2013
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We commit to transmit, in response to a reasoned request by the surveillance authorities, relevant documents on the partly completed machinery. Property rights of the manufacturer of the partly completed machinery remain unaffected.

Important Note

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of this Directive, where appropriate.

CERTIFICATION

Industrial Laser Unit for Marking:

Controller F720i (based on BCP7), Laser Head F720i.

Approved by **Certificate No.:** CUXXXXXXX 01



HEALTH AND SAFETY

GENERAL

The F-Series laser marking systems are designed and built in accordance with international standards and other technical specifications, which are to be observed. The equipment conforms to current technology and approved safety requirements.

Domino F-Series laser marking systems are produced by Domino Group company; Domino Laser GmbH Germany. For Sales and support, contact Domino.

This safety standard, however, can only be achieved if all intended and required measures have been taken and are constantly observed. It is part of the equipment operator's duties to plan these measures and check their continuing implementation.

The F-Series laser marking systems have been developed and designed for fully automated marking of packaging materials and products by use of laser radiation.

The user must ensure that:

- The laser system is only made ready for use after it has been installed and guarded to Class 1 laser safety standards (EN60825)
- The equipment is only to be used for its intended purpose
- The equipment is only operated in a good, serviceable condition, and that all safety installations are regularly checked for their serviceability
- Personal protective goggles for maintenance and repair personnel are required and made available
- Only suitable and approved tools and equipment are used
- The product manual is complete and in a legible condition at the equipment location at all times
- The valid rules and laws regarding accident prevention are available and observed
- Only sufficiently qualified and authorised personnel shall operate, maintain, and repair the laser marking system
- These personnel are regularly instructed in all matters concerning appropriate labour safety and environmental protection, and that they are familiar with the product manual, particularly the safety instructions contained therein
- Any safety and warning signs on the laser marking system must not be removed and must remain in a readable condition.

SPECIFIC DANGERS

Electrical Energy

In the F-Series laser marking system, the maximum operating voltage is the connected mains voltage, which can pose a hazard to health. The mains voltage to be maintained is shown on the name plate.

Work on live components must only be performed by authorised personnel.

In the case of a defective power supply, operation of the laser marking system is to be stopped immediately and is only to be repaired by authorised personnel.

Keep the control unit closed at all times. Only expressly authorised personnel are permitted to open the control unit.

Laser Radiation

Laser radiation can pose a risk to eyes and skin. The danger is not only posed by direct laser radiation, but also by scattered radiation and reflections from the work piece or the packaging machine. The degree of injury depends on the duration of the effect, the power and the wavelength of the laser.

Lasers and their installations are classified into seven laser protection classes, depending on their potential danger. Class 1 is the safest and Class 4 is potentially the most harmful. These classes are defined in detail in EN60825 Part 1 and are summarised below:

Class 1	The accessible laser radiation may be visible or invisible and is harmless.
Class 1M	The accessible laser radiation may be visible or invisible and is harmless, provided additional optical instruments are not used.
Class 2	The accessible laser radiation is visible and is harmless for accidental exposure to eyes for periods of less than 0.25 seconds.
Class 2M	The accessible laser radiation is visible and is harmless for accidental exposure to eyes for periods of less than 0.25 seconds, provided additional optical instruments are not used.
Class 3R	The accessible laser radiation may be visible or invisible. It is potentially harmful to eyes.
Class 3B	The accessible laser radiation may be visible or invisible. Direct radiation is harmful to the eyes and skin although diffuse radiation (reflected from a matt surface) is harmless.
Class 4	The accessible laser radiation may be visible or invisible. Direct and diffuse radiation is extremely harmful to eyes and skin and can pose a fire risk if projected onto combustible materials.



The F-Series laser marking systems, taken by themselves, are Class 4 and must not be used until suitable, interlocked guarding is fitted to achieve a Class 1 laser installation that physically prevents access to the laser radiation or automatically disables the laser when access is required to the marking area (for cleaning or maintenance, etc.).

AIMING BEAM / PILOT LASER

The system contains an aiming beam with a wavelength of 630nm to 670nm.

This laser is a class 3R laser with an output power of up to 5 mW.

HARMFUL DUST AND VAPOURS

When radiating materials by means of a laser, harmful dust and vapours can be produced. The user is responsible for appropriate measures, e.g. an exhaust system, to reduce such harmful dust and vapours to a level that complies with the allowed maximum concentration of pollutants at the work place.

LENSES

CAUTION: *Lenses must not be touched.*

Fused silica lenses are used in the F-Series laser system. If the lens has been soiled, it must be thoroughly cleaned before any operation.

Scan Head Mirrors

WARNING: **Never touch the mirrors of the scan head.**

The mirrors are inside the scan head and there is a small risk of touching them when cleaning the lens.

If the mirrors have been touched accidentally, wash hands thoroughly with water and soap.

Fumes and dust from Beryllium metal can be hazardous if inhaled.

Noise

All systems emit during operation a noise level lower than 80dB(A). No personal protective equipment against noise is needed.

Crushing

There is a crushing hazard during installation and operation due to:

- Product moving along the laser head.
- Products moving into and out of protective housing.
- Doors and maintenance openings of protective housings.

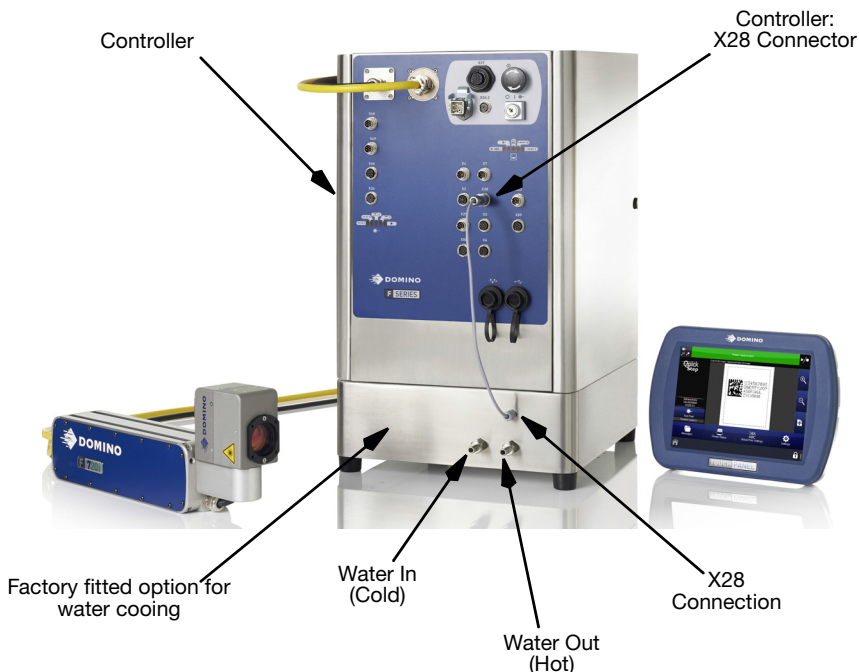
Laser Marking Process

Potential fire risks could result from examples as listed below. This list is not considered to be complete. Local conditions must be considered as well.

- Printing on not specified material (e.g. easily inflammable or explosive materials).
- Invalid parameter settings (e.g. very low mark speed).
- Invalid parameter settings due to corrupted print data.
- Printing constantly on the same product (e.g. no product movement caused by various reasons).
- Inflammable gases or materials inside the working area.
- In printing mode the laser beam is controlled by software which must be considered as part of the risk assessment.
- Install a fire detector near the laser to monitor the marking process.

Water Cooling

A factory fitted option is available to cool the laser head and controller with factory water or water from a water chiller. Use only clean and oil free water.



Hoses with an inner diameter from 3/8 inch (9.5 mm) to 10mm may be used. Hoses have to be fastened with hose clamps.

Maximum allowed water pressure is 5 bar. At a pressure higher than 5 bar, a pressure reducer must be installed on the inlet of the cooler and limited to 4 bar. The water flow is regulated automatically by a magnetic valve. The water flow, in the worst case (Mark Duty Cycle 97%, ambient temperature 45°, water temperature 27°) is 2 litres per minute. The water out of the controller has to be connected to one of the connectors of the laser cooling plate to cool the laser. The water out of the laser cooling plate is the final water out of the laser marking system.

An optional water chiller (part number L015148) is available from Domino.

Simmer Mode

The fibre laser has a simmer mode to ensure fast laser coding. As soon as the laser is switched on there will be always a laser power output of below 5 mW present.

This is a hardware feature of the laser source which is always switched on.

Lifting and Moving the Controller

WARNING: The controller weighs over 40 kg. A 2 man lift is required.

An optional mobility kit (Domino part number EPT031573) with 4 castors is available to assist moving the controller.

For lifting, four hooks are supplied with the laser system which may be mounted to the four top corners of the controller (as shown below).

4 hooks mounted to the top side of the controller



Laser Protection Window

Domino recommends installing a protection window in front of the laser lens, to keep the lens clean. A protection window can be ordered from Domino - part number EPT031339. This protection window has to be checked and cleaned regularly (recommended daily) depending on the production rate. These intervals may be expanded afterwards.

WARNING: The windows must be exchanged if it can no longer be cleaned.

Guarding

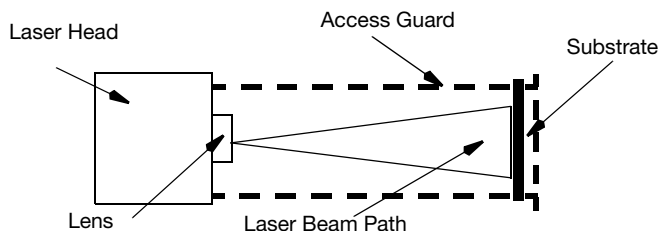
The following type of guarding, using the recommended materials and construction techniques, is required to achieve a safe installation.

WARNING: Never install a laser in such a way that the lens points to a door or in the direction of an operator.

When designing a housing for a fibre laser, always use overlaps where possible to trap the laser light inside the housing, especially for mark on the fly applications where a product inlet and outlet to the housing are needed

ACCESS GUARDS

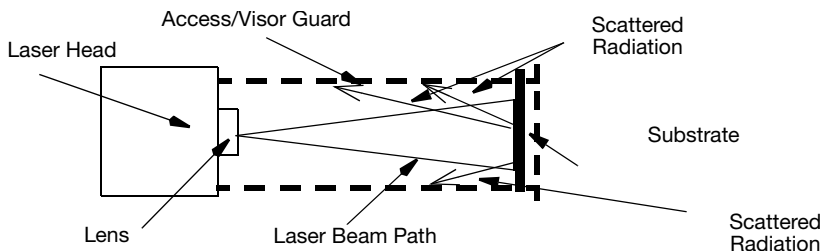
Access guards are required to prevent direct human access to the laser beam. In practice, this requires full guarding of the area between, and including, the laser output lens and the area to be marked on the substrate.



Note: Guarding is required behind the substrate to prevent access to the laser beam when the substrate is removed, or following accidental burn through of the substrate.

VISOR GUARDS

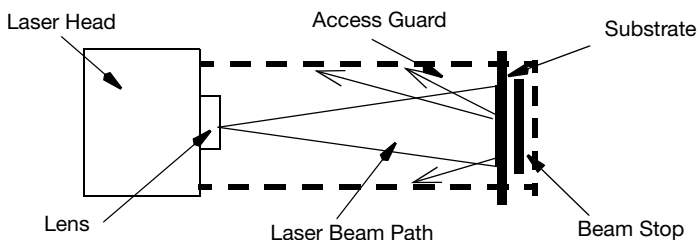
Visor guards are required to prevent the escape of scattered radiation. Often the access guarding can be designed to perform this function without the need of an extra guard.



WARNING: Visor guards have to be installed at a minimum distance of four times the focus distance to the laser beam.

BEAM STOP GUARD

A beam stop guard is required for applications where guarding material is fitted within 100mm of the laser lens focal plane. The beam stop is to prevent burn through of the guard should the laser be repeatedly operated without the substrate in position. The beam stop must be capable of absorbing the full output power of the laser for a period of eight hours and be large enough to cover the complete laser marking field area.



MATERIALS

All guard materials must be opaque to 1030 to 1200 nanometers and to 630 to 670 nanometers wavelength laser light, produced by the fibre laser or pilot laser. Guards may be metallic and non-reflecting, however if a see-through guard is required a material opaque 1030 to 1200 nanometers wavelength laser light must be used.

See through guards must be special laser safety windows.

Always use non-reflecting materials.

The thickness of the guard material depends on the mechanical strength required, and the amount of 'burn through' anticipated. For the purpose of adequate mechanical rigidity, a thickness of at least two millimetres, and preferably three millimetres of steel plate is recommended. To ensure laser safety a greater thickness of the guard material may be required.

In a fault condition, these materials withstand the laser beam for a limited time before the beam burns through. The laser must therefore be monitored to avoid a risk of fire.

A ceramic or metal plate may be used as a beam stop. A greater thickness is required to achieve the "eight hour burn through" requirement.

Guidance regarding laser guards can be found in EN60825-Part 4.

BEAM DELIVERY CABLE (FIBRE)

Should the beam delivery cable break, there is potential for it to no longer be Class 1. There is no cable break or fibre break detection offered on this product. The integrator must either include the beam delivery cable inside the Class 1 enclosure with the Pulsed Laser Aperture or undertake suitable measures to ensure that under reasonable use, the cable is suitably positioned to prevent it from becoming damaged or mishandled.

The beam delivery cable has not been designed for robotic applications. The Laser must not be designed into systems where the Beam Delivery Cable will be subject to high levels of acceleration, torsion and twist, or combination thereof. If this is a requirement for the integration, please contact Domino to discuss the application in more detail.

The minimum bend radius (r) for the fibre is 75mm.

INTERLOCK SWITCHES

Interlock switches must be fitted to all access guards preventing access to the laser output lens and marking area that can be opened without the use of access tools.

Interlock switches must be wired into the laser control circuit so that the laser beam is disabled when the guard is removed.

Emergency Off

Integrate the laser into the emergency off circuit of the machine into which the laser is integrated. Install an emergency off push button near the laser marking systems which turns off the laser. Connect the emergency off push button via the interlock circuit to the controller.

GUARDING LABELS

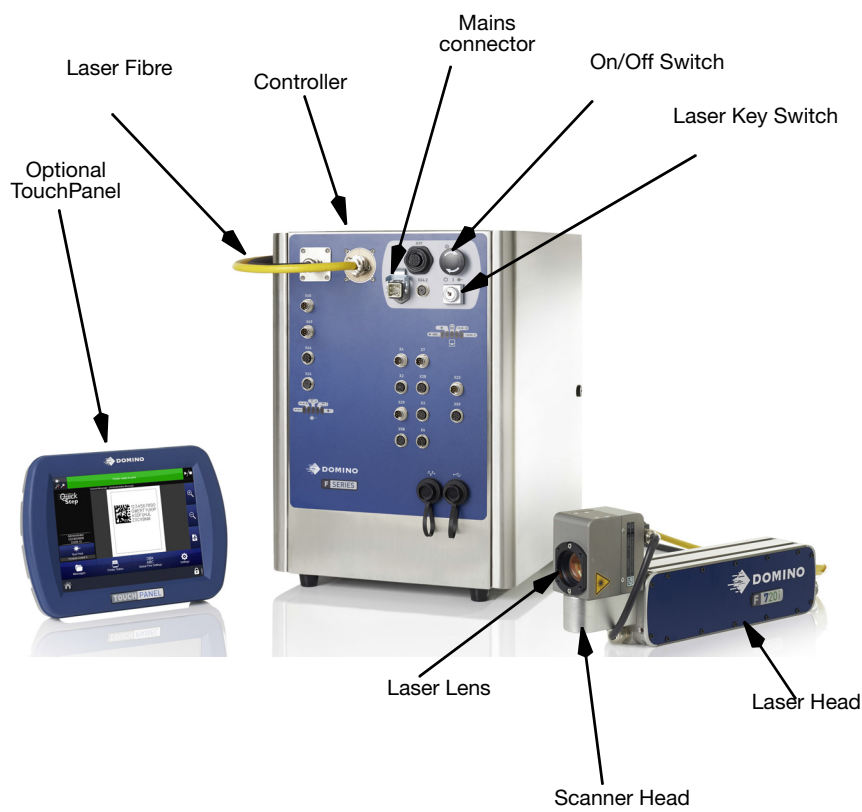
Domino recommend that the following information is prominently displayed on the guard:

**WARNING: Class 1 laser product containing an embedded class 4 laser.
 Operation of the product with safety guards removed may result in
 hazardous exposure to laser radiation.**

These labels are supplied with the laser system. Additional labels are available from Domino Printing Sciences plc as part of the Guarding Labels Kit, Part Number L007628.

OPERATION

F-SERIES LASER MARKING SYSTEM



CONTROLS AND INDICATORS

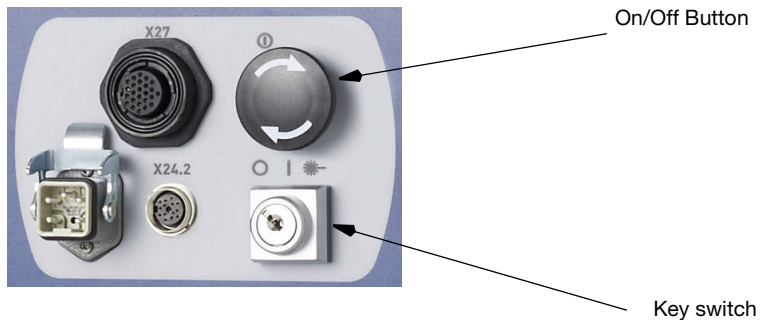
The User Interface, Indicator Lamps and Software icon functions are described in the following paragraphs:

TouchPanel and Interface

The software is operated via a PC keyboard, TouchPanel or Web Browser. An entry is confirmed with the left mouse button if PC or Web browser are used. The optional TouchPanel if connected, allows entry by touching the tabs and function keys on the screen. An onboard keyboard is included in the software.

Note: The Web Browser does not support the message editor.

Controls



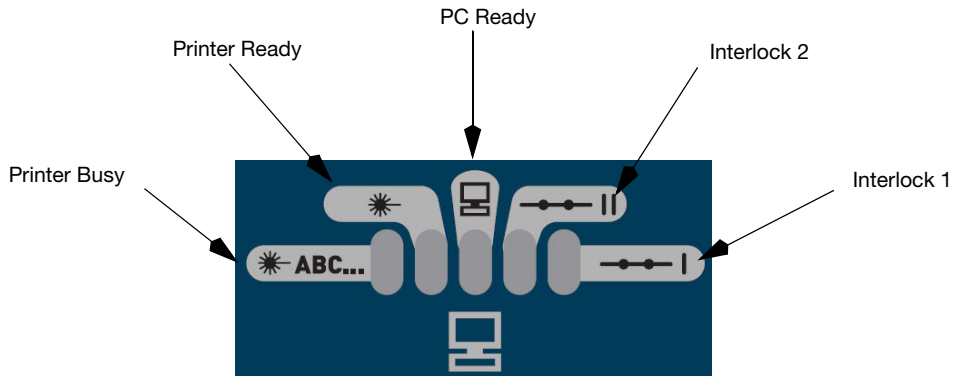
ON / OFF BUTTON - Starts and stops the controller and PC unit

KEY SWITCH - Starts and stops the Laser

The key switch has three positions:

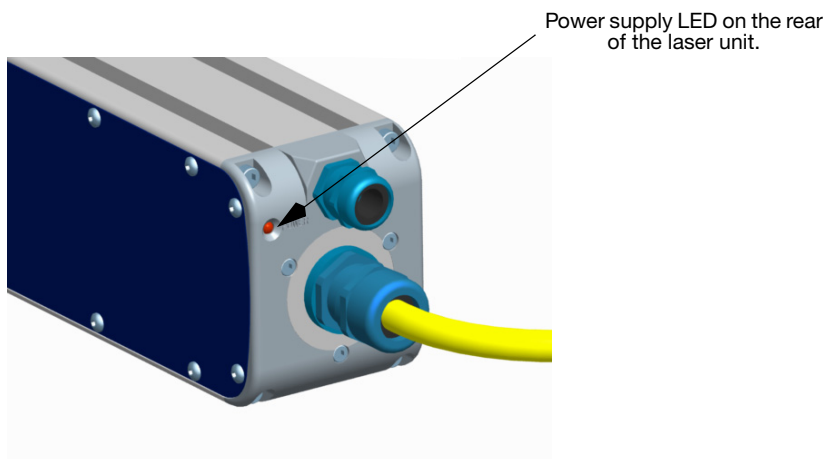
- "0" Laser off
- "1" Laser ready
- "*" Laser start.

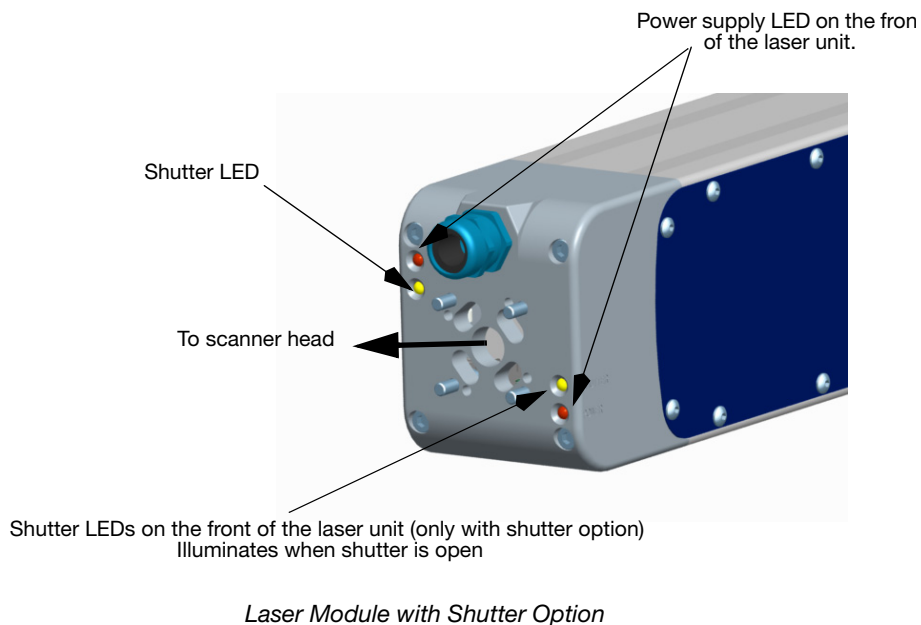
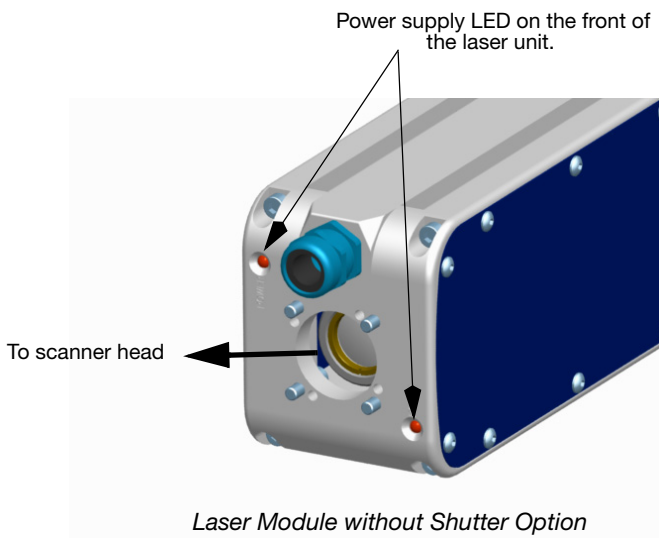
Indicator Lamps Controller



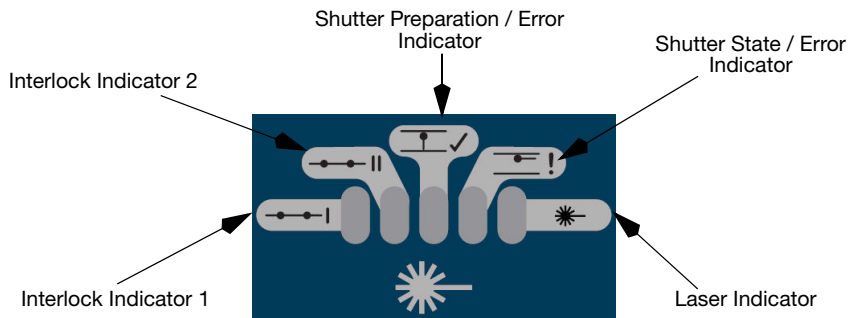
- Interlock 1 - Illuminates when the interlock 1 is closed.
- Interlock 2 - Illuminates when all the interlocks are closed.
- PC Ready - Illuminates when the internal PC is ready.
- Printer Ready - Illuminates when the Laser is powered up and marking system is ready to print.
- Printer Busy- Illuminates when the Laser is marking

The activation of the laser power supply is also indicated by two red (Power) LEDs on the front and one at the rear of the laser module.





Indicators Lamps Fibre Laser



Interlock Indicator 1 and 2

Lit GREEN	Interlock 1 and 2 respectively are closed.
Both interlock 1 LED and interlock 2 LED are alternating RED flashing	Wrong order was in the interlock loops e.g. open and close one loop only. Correct and restart the process. The interlock has been opened while the shutter self-test was running.
Both interlock 1 LED and interlock 2 LED parallel RED flashing	An electrical error (cross connection) was detected. Debug wiring and restart the process.
Both Interlock 1 LED and interlock 2 LED are lit RED:	The safety relay is completely shut down. Inspecting of its display is suggested. Power cycling is required.

Within approximately 8 seconds after power up (boot phases of the safety relay) the display of both interlock LEDs is not valid.

Shutter Preparation / Error Indicator

Blinking GREEN	Waiting for start command.
Lit GREEN	Ready.
Lit RED	A shutter malfunction is present
Blinking RED	A shutter malfunction was detected but no more present.
Blinking ORANGE	A shutter malfunction was detected - waiting for start command.
Lit ORANGE:	No shutter and shutter controlling is equipped.

Shutter State / Error Indicator

Lit YELLOW	Shutter is open WARNING: laser radiation is possible!
Lit RED	Shutter temperature display (after power-up only).
Lit RED (permanent)	shutter feedback cross-check failed.
Flashing RED while the GREEN Shutter preparation LED is lit or blinking	Shutter is close to over temperature.
Blinking RED while GREEN shutter preparation LED is blinking	A shutter over temperature, or sensor fail (<10°C) had occurred. Therefore the laser was switched off. Restart is possible.
Flashing RED while GREEN shutter preparation LED is off	A shutter temperature sensor fail (<10°C) is present. Therefore the laser is switched off.
Blinking RED while GREEN shutter preparation LED is off	A shutter over temperature is present. Therefore the laser is switched off.

Note: The GREEN shutter preparation LED blinking is suppressed if one or both interlock is not closed.

Laser Indicator / Error Indicator

Lit YELLOW	Laser source ready for emission.
Lit RED (error)	Laser is not (correctly) started.
1x Flashing YELLOW	Laser modulation (print activity) missed.
2x Flashing YELLOW	Laser modulation (print activity) not permitted.
3x Flashing YELLOW	Laser modulation (print activity) missed AND not permitted.

LED Test display on Power Up

After power up, the controller will start an error test display in the following sequence:

- Shutter state error; each sec. means 10° Celsius of scanner temperature. This display shows that the temperature sensor of the shutter housing is properly connected, and that the LED works.

Then, approximately 8 seconds after power up the 4 LED's from top to bottom:

- Extinguish for a moment
- Light up (RED) for 1 second each, top to bottom
- Extinguish for a moment
- Display status as described above

If unauthorised changes are performed, the warranty will be invalidated.

SWITCHING ON AND OFF

- WARNINGS:**
- (1) The laser marking system must only be used for its intended purpose.
 - (2) The laser marking system may only be operated by personnel trained to do so by Domino.
 - (3) Operation is only allowed with all required cables connected and all parts mounted. Do not disconnect any cables during operation.

CAUTION: The lens cap must be removed before operation.

Switching On the Control Unit

At the controller, release the On/Off button by turning it clockwise. Wait until the SERVER RUNNING  indicator has illuminated.

Switching On the Laser Head

Turn the key switch from position “0” to position “1”. To start the laser turn the key clockwise to the laser symbol and hold it for at least 1 second. The key automatically turns back to position “1”.

- The laser needs a warm-up phase of 3 seconds.

The PRINTER BUSY  ABC... indicator will illuminate when the laser hardware is switched on.

The PRINTER READY  indicator illuminates. After initialising the Dynamark 3 software and starting the lasers, the marking system is ready.

Laser emission is also displayed by a red LED on the rear of the laser unit.

Switching Off the Laser Head

Turn the key switch from position “1” to position “0”. The laser hardware is switched off.

Switching Off the Control Unit

Press the On/Off button at the controller. The computer will immediately switch off.

F-SERIES CONNECTIVITY

The F-Series is operated either via a remote TouchPanel or via a PC running on Microsoft Windows 7® or Windows 8® with installed QuickStep software.

To connect to one F-Series, the TouchPanel is connected to the X59 TouchPanel connector of the controller.

The TouchPanel then displays the UI relating to that printer.



One TouchPanel can control multiple F-Series in the same network if required.

Details about the printer being controlled are displayed in the Home screen which lists: the logged in user, the printer's name and the printer model. To connect to another printer in the network, follow the steps below:

- (1) Disconnect from the current printer by pressing the Lock button and selecting Disconnect From Printer to display the printers' list screen.
- (2) Press the Lock button and select Unlock UI Settings, enter the password (QS).
- (3) Press Settings, select Broadcast (default) as the connection method.
- (4) Go back to the printers' list screen and press Refresh to view a list of all printers in the network.
- (5) Select the required printer.

A list of favourite remote printers can be created, as follows:

- (1) From the printer's list screen, press the Lock button and select Unlock UI Settings, enter the password (QS).
- (2) Press Settings and select Favourite as the connection method.
- (3) Press Add Favourite and fill in the required fields manually or get a favourite printer from broadcast
- (4) Select a printer from the Broadcast list.
- (5) Press Add to Favourites.

WEBSERVER

One may also connect to the printer's UI via standard web browser. The following web browsers are supported:

- Microsoft Internet Explorer from version 9.0 on
- Mozilla Firefox from version 22 on
- Google Chrome from version 27 on
- Apple Safari from version 6 on

Not the complete functionality of the UI is available when connecting to the printers via a web browser.

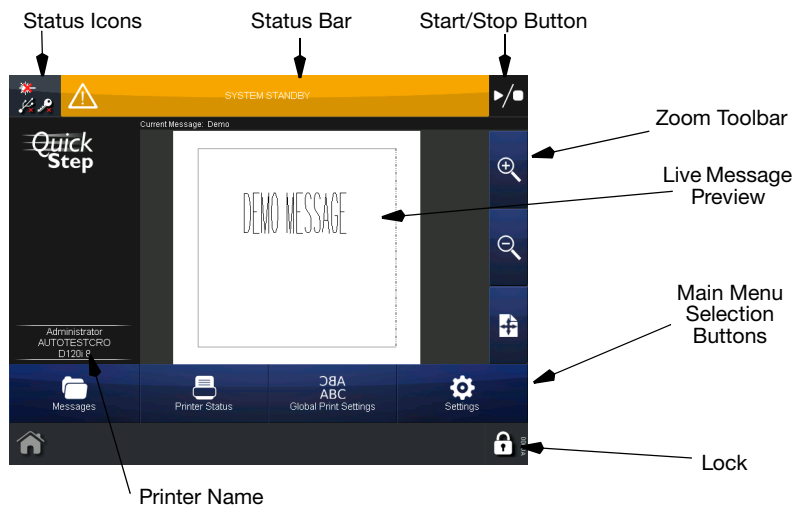
Not available is:

- The Message Editor which is accessed via *Home Screen > Settings > Message Editor* or via *Home Screen > Messages > New Message / Edit Printing Message*

QUICKSTEP INTERFACE

Home Screen

When starting the printer, the following Home screen is displayed.



Status Icons:

Displays current status of printer, e.g:

- Laser active
(Laser is busy - laser emission!)
- USB device connected
(USB device connected to controller or TouchPanel)
- Dongle connected
(Pharma or Service dongle connected)

Status Bar:

Displays printer and alert status. If more than one alert is present, the highest priority alert is displayed.

Start/Stop Button:

- Enables marking

Note: If the laser unit is switched off, it must be switched on before marking can take place.

- Stops marking
- Triggers a print
- Restarts the Printer

Zoom Toolbar:

Zooms in and out and to marking field

Live Message Preview:	Main working area. Used for settings and message creation.
Main Menu Selection Buttons:	Navigate to the four main QuickStep areas where all functions of the operational software can be accessed.
Lock Button:	• Locks the screen to prevent accidental changes • Login and logout • Disconnects from printer
Printer Name:	Shows the printer which is being currently controlled

Status Bar

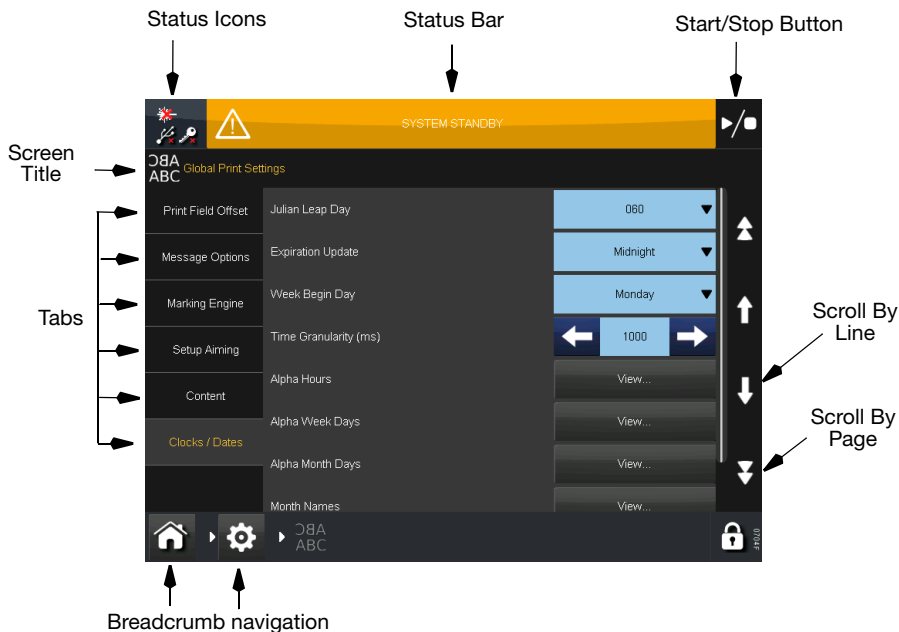
The status bar displays informal warning and error messages in different colours:

- Green - the condition is normal, no action is required.
- Blue - the condition requires attention but does not prevent marking except when the system is in standby mode.
- Yellow - the condition prevents marking, however if marking was enabled and the reason for this fault has become obsolete it automatically re-enables marking.
- Red - the condition prevents marking and requires immediate correction.

Note: Click on the status bar to acknowledge errors.

General Functions

The following illustration shows the Global Print Settings screen and the various screen areas.



Click long on a button to get a description. Click long on a button of the *Settings* area to move this button to the *Home* screen.

Note: The breadcrumb navigation shows the current location inside the menu structure. One can switch the user interface level by clicking on the icons; it is also a quick way to return to the home screen from any page.

Initial Setup

The initial setup configures the overall look of the interface and also configures basic settings and presets for printer operation.

Display Settings

Home > Settings > Regional > Language and Keyboard

Set:

- Language.
- Keyboard layout.
- IME Scheme.
- Primary currency.

Setting the Master Clock

Home > Settings > Regional > Date and Time

Set:

- System date.
- System time (24 hour clock).
- Time zone.
- Automatic Daylight Saving Time.
- Setup the Network Time Protocol.

Security Management

Password protection prevents unauthorised changes to the software, and unauthorised operation of the laser marking system.

Some functions can only be accessed from higher user levels; the higher the user level, the more functions are available. The current user level is displayed in the Title Bar across the top of the user interface screen.

The functions that can be accessed for each user level are as follows:

User Level	Functions	Password
Logout	View the main functions	none
Operator	Start / stop marking, select message, acknowledge alerts	op
Supervisor	Create/Edit messages; Change Marking Parameters; Access to Editor and Save Editor	sv
Administrator	Edit most of the setup	Not published
Service	Access everything	Daily changing

Extended system parameter settings can only be changed after entering the Administrator password. This password is only known by employees authorised by Domino.

Note: If unauthorised changes are performed, the warranty will be invalidated.

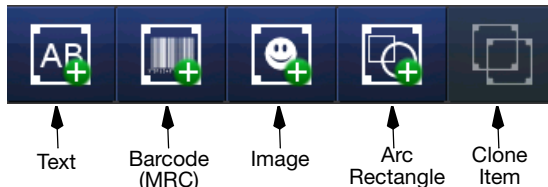
Changing the passwords after the initial installation is recommended.

Creating and Editing a Message

Add Text

- (1) Select *Messages > New Message* or *Settings > Message Editor* to open the Message Editor.
- (2) Press on the screen within a specific area of the Message Editor where you require the item to appear. A cross hair will appear at this location.
- (3) Select the Add  icon.

The *Add* sub-menu displays:



- (4) From the sub-menu select the Text  icon.

Note: Change keyboards by selecting the appropriate Alternative Keyboard icon at the bottom of the text entry screen.

- (5) Enter the required text using the keyboard and select the green tick icon when finished.
- (6) To change text, select the text item and then the Keyboard icon on the *Edit* sub-menu.
- (7) To change text parameters (Object Name, Position, Bold, Width etc.), use the sub-menu (Font, Alignment) or select More...
- (8) To delete an object, select the object and select the delete  icon of the *Edit* menu
- (9) Activate the message for printing by sending it to the printer  via the *File* menu 

Add a New Barcode

To add a barcode to the message:

- (1) Press on the screen within a specific area of the Message Editor where you require the item to appear. A cross hair will appear at this location.
- (2) Select the Add Barcode  icon and select the type and specification required from the list and editable text boxes.
- (3) Use the Text, Variable, Edit Variable and Properties tabs to enter the barcode data.
- (4) Select the green tick icon to insert the code into the message.
- (5) Edit the barcode by highlighting the barcode within the message and using the sub-menu or by selecting More...
- (6) Activate the message for printing by sending it to the printer  via the *File* menu 

Add an Image

To insert an image into the message:

- (1) Press on the screen within a specific area of the Message Editor where you require the item to appear. A cross hair will appear at this location.
- (2) Select the Image  icon from the Add menu.
- (3) An images folder stored in the printer will open.
- (4) Browse for the required image.
- (5) Select the green tick icon to insert the image.

Note: Monochrome Bitmap (.bmp), DXF (*.dxf) (up to Version 12, information about 3-dimensional objects is discarded, fonts and labels are not supported) and Hewlett Packard Graphics Language HPGL (*.plt) black white graphic file formats are supported.*

Supported commands for HPGL import are: Arc Absolute, Arc Relative, Plot Absolute, Plot Relative, Pen Up, Pen Down

- (6) Select the Move  icon to move the copied item to the desired location within the message.
- (7) Activate the message for printing by sending it to the printer  via the File menu .
- (8) Use the File Manager (*Home > Settings > File Manager*) to copy an image from a USB device to the controller.

Add a New Variable

Message or system variables may be added. Message variables may only be used in the message in which they have been created. System variables can be used in all messages.

- Message variables are created via *Home > Settings > Message Editor > Add*  *> Text*  *> Add Variable* .
- System variables are created via *Home > Settings > Message Editor >*

File  *> Add/Edit Variable*  *> Add Variable* .

Note: System variables are referenced within message via a link. Insert a link into a message to use a global variable.

The following variables can be created and added to the message:

- Clock (message & system).
- Counter (message & system).
- Prompted Field (message only).
- Link (message only).
- Script (message only).
- Coding (message only).
- Shift Code (message only).
- Text Insert (message & system).
- Text Variable (message & system).
- Text Link (message only).

Notes: (1) System variables are emptied on a power cycle.

(2) All steps below are described for local variables as they are the same for global variables.

Add a New Clock

To add a new offset clock to the message:

- (1) Press on the screen within a specific area of the Message Editor where you require the item to appear. A cross hair will appear at this location.
- (2) Select the Add  icon.
- (3) From the sub-menu select the Add Text  icon.
- (4) Select *+Variable > +Create New > Clock*.
- (5) The scope cannot be changed - use the *File* menu to create a global counter.
- (6) Enter a name for the clock or use the default name and use the drop down lists to select the format.
- (7) Select the required offset parameters (Days, Months, Years and/or Hours, Minutes, Seconds and/or Weeks) and add values using the keyboard. Select the green tick icon when each parameter is completed.
- (8) Review the entered information and select the green tick icon if correct or press in the required field to add or change values.
- (9) Select the green tick icon to enter the offset clock into the message.
- (10) Activate the message for printing by sending it to the printer  via the *File* menu .

Add a New Counter

To add a new counter to the message:

- (1) Press on the screen within a specific area of the Message Editor where you require the item to appear. A cross hair will appear at this location.
- (2) Select the Add  icon.
- (3) From the sub-menu select the Add Text  icon.
- (4) Select *+Variable > +Create New > Counter*.
- (5) The scope cannot be changed - use the *File* menu to create a global counter.
- (6) Enter a name for the counter and enter the Format String "N" for numerical and "A" for alpha characters.
- (7) Select a Leading Character Mode from the drop down options: None, Blank or Custom. If a custom character is selected in the Leading Character box, enter the character required.
- (8) In the Step Control box, select the option required to activate the increment:
Print Start
User Input (Rising Edge)- specify the User Input to be used
User Input (Falling Edge)- specify the User Input to be used
- (9) In the External Reset box, select None, Mark Enable, Application Start, Message Load, User input Rising Edge, User input Falling Edge.
- (10) In the Counter Repeat box, enter the number of items to be marked before the counter increments (default value is '1').
- (11) Step Size sets the increment value of the selected counter from 1 to 99999. The default value is '1'.
- (12) Set the current value in the selected alphanumeric format of the counter.
- (13) Set the start value in the selected alphanumeric format for the counter. If the start value is larger than the end value the counter will count backwards.
- (14) Set the end value in the selected alphanumeric format of the counter.
- (15) Edit, if required, the Alpha Field String. to be used for the alpha designators in the counters. All alphanumeric characters are available for use in this string. The maximum string length is 26 characters. The default string is A to Z (including all characters).
- (16) Select an Ending Action: Select None, Disable, User Output or User output and disable. Select the User Output if activated.
- (17) If required, set a Batch Link to another counter when this counter has it's end value and select the linked counter from the drop down list.
- (18) Review the entered information and select the green tick icon if correct or press in the required field to add or change values.
- (19) Select the green tick icon to enter the counter into the message.
- (20) Activate the message for printing by sending it to the printer  via the *File* menu .

Add a New Prompted Field

Prompted text fields may be inserted into messages. The content of these text fields is entered in QuickStep after sending the message to the printer. The content format has to be specified when creating these text fields in a message in the *Message Editor*.

To add a new prompted field to the message:

- (1) Press on the screen within a specific area of the Message Editor where you require the item to appear. A cross hair will appear at this location.
- (2) Select the Add  icon.
- (3) From the sub-menu select the Add Text  icon.
- (4) Select **+Variable > +Create New > Prompted Field**.
- (5) Enter a name or use the default name for the prompted field object.
- (6) Set a default value in the format matching the input mask for the prompted field.
- (7) Enter a prompt which is displayed on screen when the data for the prompted field should be entered. (After sending the message to the printer).
- (8) Select an input mask for the prompted field which specifies the type of content for the prompted field. Possible formats:

Mask	Description
0	Mandatory numeric character 0-9
9	Optional numeric character 0-9
L	Mandatory alpha character A-Z or a-z
?	Optional alpha character A-Z or a-z
A	Mandatory alphanumeric character 0-9, A-Z or a-z
a	Optional alphanumeric character 0-9, A-Z or a-z
C	Mandatory any character
c	Optional any character
#	Optional currency symbol €, \$, £ or ¥
&	Mandatory any character or space

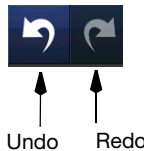
- (9) Review the entered information and select the green tick icon if correct or press in the required field to add or change values.
- (10) Select the green tick icon to enter the prompted field into the message.
- (11) Activate the message for printing by sending it to the printer  via the *File* menu .

Add a New Link

To add a new link to the message:

- (1) Press on the screen within a specific area of the Message Editor where you require the item to appear. A cross hair will appear at this location.
- (2) Select the Add  icon.
- (3) From the sub-menu select the Add Text  icon.
- (4) Select **+Variable > +Create New > Link**.
- (5) Enter a name or use the default name for the link object.
- (6) Specify the source of the link, e.g. a counter or a clock or message content element. System variables are entered into a message via a link.
- (7) Select the green tick icon to enter the offset clock into the message. The link object will have the same content as the source object.
- (8) Activate the message for printing by sending it to the printer  via the **File** menu .

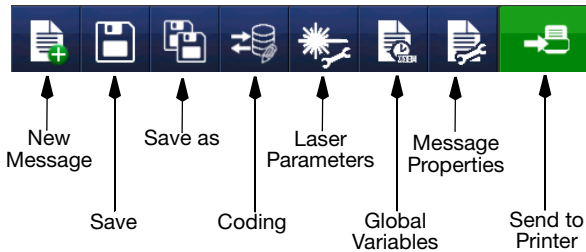
Undo / Redo



Undo re redo the last editing steps in the message editor including change of settings or parameter settings.

Note: Creating a new message clears the undo cache - no undo to the last message is possible.

File



New Message - Creates a new message.

Save - Saves the current message in a selected message store.

Save as - Saves the current message with a given name in a selected message store.

Coding - Selects a source for the coding variable.

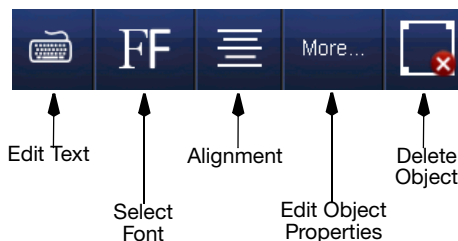
Laser Parameters - Create, delete and edit laser parameter sets.

Global Variables - Create global variables.

Message Properties - Message settings overwrites system settings of Fields, Mark on the Fly, Vector Sorting and activate usable fields. Also enables the user to activate Optical Correction, Tube Distortion and PN Transformation.

Send to Printer - sends the current message to the printer and activates it for printing.

Edit



Edit menu for a text object.

Edit Text - Opens the keyboard to edit the text content.

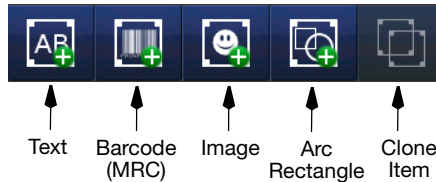
Select Font - Opens the list of available fonts to select a font.

Alignment - Sets the alignment of the object.

Edit Object Properties - Allows editing the properties of the object.

Delete Object - Deletes the selected object.

Add



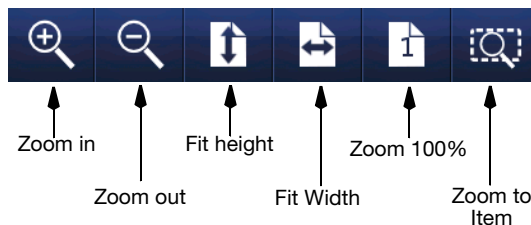
Move



Select an object in the editor by clicking on it and move it in the desired direction by clicking on the arrow icons.

Drag and drop can also be used. Select and hold the item within the message and move it to the desired location.

Zoom



To view the item(s) in the Message field, or the whole Message field in a different size, select the item(s) and then select the appropriate button from the above toolbar:

- Incrementally zoom in on the message area.
- Incrementally zoom out of the message area.
- Fit whole message height to area.
- Fit whole message width to area.
- Zoom to 100% (actual size) of Message.
- Zoom selected item to fit into message area.

Re-order Visual Items



Sets the order of objects to print.

Select an object of the list and use the arrows to change the order.

Item Selection List



Selects multiple or all objects of a message. Select the items of the list to be selected. Or click on “Select all” to select all objects. Click on “Clear Selection” to have no object selected.

Resize

Resize an object by selecting it and dragging the red mark of the object.

MESSAGE STORE AND FILE MANAGEMENT

Selecting an Existing Message

Note: Where no message is selected for printing, no live message will be displayed in the Home screen.

- (1) Select the Messages button to open the Message Store.
- (2) Select the required message from the list.
- (3) Choose to Edit, Preview or Send to Print.

Note: Send to Print will revert to the Home screen. The selected message will then be displayed.

File Manager

Home > Settings > File Manager

File Manager is a useful way of reviewing and organising stored messages, images and scripts.

Using File Manager it is easy to edit files, create new folders and copy content between folders.

New Store: Create a new store for messages, images and scripts.

Note: A new message store can only be created in the messages folder.

Edit:

- Rename
- Copy
- Cut
- Delete
- Details

Paste: Used with the Copy/Cut commands to add files into folders.

MAINTENANCE

CHECKING FANS AND AIR VENTS

WARNING: Before undertaking any work on the laser marking system, unplug the mains power.

The fans are located at the bottom of the control unit.

A fan defect immediately poses a danger of overheating that may result in damage to the control unit, therefore the fans must be checked once a month.

CONTROL UNIT

- (1) Check the fans for bearing noises. If bearing noise exist, the respective fan must be replaced.
- (2) Check the fan filters of the controller for blockages and dirt. If necessary exchange them. The doors have to be opened to exchange the filters.

CLEANING THE LENS

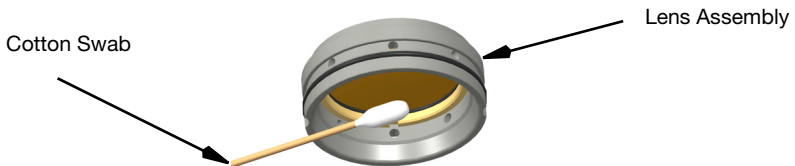
WARNING: Ensure the mains power plug is removed before cleaning the lens.

- CAUTIONS:**
- (1) Do not use compressed air from the installation for cleaning.
 - (2) Water must not be used for cleaning, as the lenses are not water resistant.
 - (3) Clean carefully as there is a risk of scratch marks on the lens which will reduce the marking quality

The lens must be checked monthly for dust, and if necessary be cleaned with (absolutely clean) compressed air from a can.

For all other dirt, the lens must be cleaned with Isopropyl Alcohol and lens paper, or cotton swabs (Q-tips), as follows:

- (1) Take an unused cotton swab (cotton bud) and soak one end in Isopropyl Alcohol.
- (2) Lightly wipe with **ONE PASS ONLY** across the surface of the lens.



- (3) Inspect the cotton swab. If dirt or oil is present, repeat steps (1) to (3).
- (4) Use the dry end of the cotton swab to lightly wipe excess liquid from the lens.

GENERAL CLEANING

WARNING: **The laser marking system and the connected installation must be switched off with the mains supply to the laser marking system disconnected.**

The outer surfaces may be cleaned with a damp cloth and a mild cleaning agent only. No humidity must get into the system.

SERVICE: REPLACEMENT OF COMPONENTS

Applications without Shutter

Maximum cycles of E-Stop Relay PNOZ S4 (opening of guard door when laser is printing)	15 Million
Maximum cycles of E-Stop Relay PNOZ S4 (opening of guard door when laser is not printing)	100 Million

Applications with Shutter

Maximum cycles of Shutter	10 Million
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FAULT FINDING

SYSTEM STATUS MESSAGES

	Status Message	Cause	Suggested Action
11	Encoder/Line too fast (overflow).	The message has not been completed in time.	Slow down the conveyor, reduce the mark time, or move the text upstream on the field.
12	Encoder/Line too slow (underflow.)	The message has not been completed in time.	Reduce the mark time or move the text upstream on the field.
13	List buffer repeat count fail.	Internal Fault.	Restart the system. Contact Domino.
14	Maximum print to print distance exceeded.	The maximum distance between print go signals has been exceeded and an expected print go was not received.	Restart the system. Contact Domino.
15	Print start signal ignored.	A print go has been received too soon after the previous.	Restart the system. Contact Domino.
16	Maximum laser on time exceed (laser disabled by hardware).	The laser has been firing for longer than expected.	Restart the system. Contact Domino.
17	Laser warm up.	A short warm up period is required before use.	Restart the system. Contact Domino.
30	Scanhead power missing.	There is no +/-15v at the scanhead, or no data returning from scanhead.	Restart the system. Contact Domino.
31	Scanhead temperature out of valid range.	The scanhead is cold.	Restart the system. Contact Domino.
32	Scanhead warming up -please wait.	The scanhead is cold.	Wait for the heaters in the scanner motors to warm the scanners, the printer can be used but you may experience very minor position errors.
33	Control unit over temperature.	The temperature in the controller is very cold or too hot.	Check that the fans are working and that the filters are not blocked.
51	Control unit near over temperature.	The controller is getting quite hot.	Check that the fans are working and that the filters are not blocked.
56	Printer ready to print.	Printer will print if a print go signal arrives.	Information Only.
58	No Message loaded	There is no valid message loaded into the controller.	Load a message and send it to printer.

	Status Message	Cause	Suggested Action
549	Turn keyswitch to enable marking	The safety relay needs to be set after an interlock has been opened.	Turn keyswitch to start position, or give a remote start input (the “Play” button on the UI will not function).
550	System disabled	The keyswitch is at position 0.	Turn the keyswitch to position 1.
551	Aiming turned on	The aiming beam, configurable in the global settings, is turned on.	Information Only.
552	External Interlocks Open	The interlock or interlocks are open.	Close the guards to 'make' the interlocks.
553	External Interlock 1 Open	The interlock switch 1 is open	Close the guards to 'make' the interlocks.
554	External Interlock 2 Open	The interlock switch 2 is open	Close the guards to 'make' the interlocks.
555	Air Fault	Not enough air flow to cool the laser.	Check the air regulator filters and pressure settings.
556	Vacuum Fault	The DPX is not running.	Make sure the DPX is serviceable and running.
557	Filter not ok	The DPX filters are blocked.	Change the DPX filters.
578	System Standby	The keyswitch is at position 1 but not yet set by turning the keyswitch or remote start.	Turn the keyswitch to start position, or give a remote start input, or press the “Start” button on the user interface.
579	Printer enabling.	The laser is switched on but warming up.	Wait for the printer to be ready.
580	Inconsistent Laser On State	The laser start input level is being overridden by a user interface laser on selection or by a fault message.	Restart the system. Contact Domino.
581	Next controller not ready	The next controller in a “chain” in a Multihead configuration is not ready.	Restart the system. Contact Domino.
582	Controller Idle (Multi Head System)	The system is part of a multi head “chain” but has been disabled (see install options). This is for information only.	Restart the system. Contact Domino.
583	External Interlock has been opened	One or both interlocks was opened but is now closed.	Restart the system. Contact Domino.
594	Safety Relay Fault	There was a laser start command present while one or both (CAT3/4) interlocks were not closed.	Make sure the interlocks are closed before giving the laser start input.

Note: For all other errors or messages contact Domino.



Domino F720i User Documentation

Domino Printing Sciences plc has a policy of continuous product improvement, the Company therefore reserves the right to modify the specification contained within this document without notice.

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