

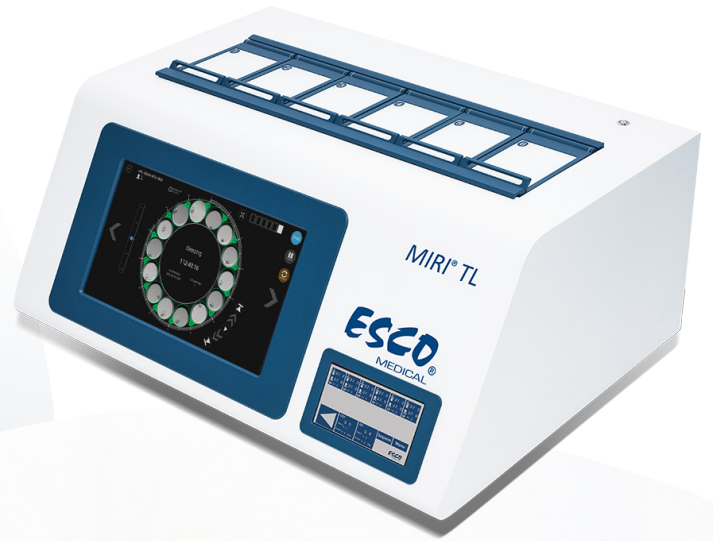
The Next Generation of Time-Lapse Systems

# MIRI<sup>®</sup> TL

Time-Lapse Incubator for IVF

This equipment is a CE-marked device and is in conformity with the essential requirements of the medical devices EU regulation 2017/745.

**ESCO**  
MEDICAL



## Design Excellence - Superior Quality

All the features you love about  
the MIRI<sup>®</sup> Time-Lapse System.



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# MIRI<sup>®</sup> TL

“A state of the art Time-Lapse incubation system for IVF”



*MIRI<sup>®</sup> TL — Never miss a significant event in embryo development with the continuous monitoring system.*



The MIRI<sup>®</sup> TL is a multiroom incubator with a built-in camera and microscope that allows embryologists to view the development of the embryo from fertilization until the day of transfer without any disturbances. This significantly reduces the environmental stresses on the embryo when compared to current standard incubation practices.

The technology built into the MIRI<sup>®</sup> TL allows all important events to be observed, this allows embryologists to annotate and choose the best embryos for transfer based on their morphokinetics; aiming to improve embryo traits and pregnancy rates.

## FEATURES:

### Heated Lid

- Prevents condensation.
- Enhances temperature regulation/recovery.
- Excellent uniformity between the top and bottom lid.

### Time-Lapse Monitoring

- As images are digitally-stored, a video can be generated to enable a more objective and reliable grading of embryos.
- The Time-Lapse video enables detailed scoring of of cultured embryos, to better predict embryo development and implantation potential.

### Multiroom System

The MIRI<sup>®</sup> TL6 and MIRI<sup>®</sup> TL12 have multiple independent chambers with very stable environments, allowing embryologist to culture embryos from individual patients in individual chambers.

MIRI<sup>®</sup> TL6: 6 Individual chambers

MIRI<sup>®</sup> TL12: 12 Individual chambers

Gas recovery: less than three (3) minutes\*

Temperature recovery: less than one (1) minute\*

\*If the lid has not been opened for more than 30 sec

### Direct Heat Transfer

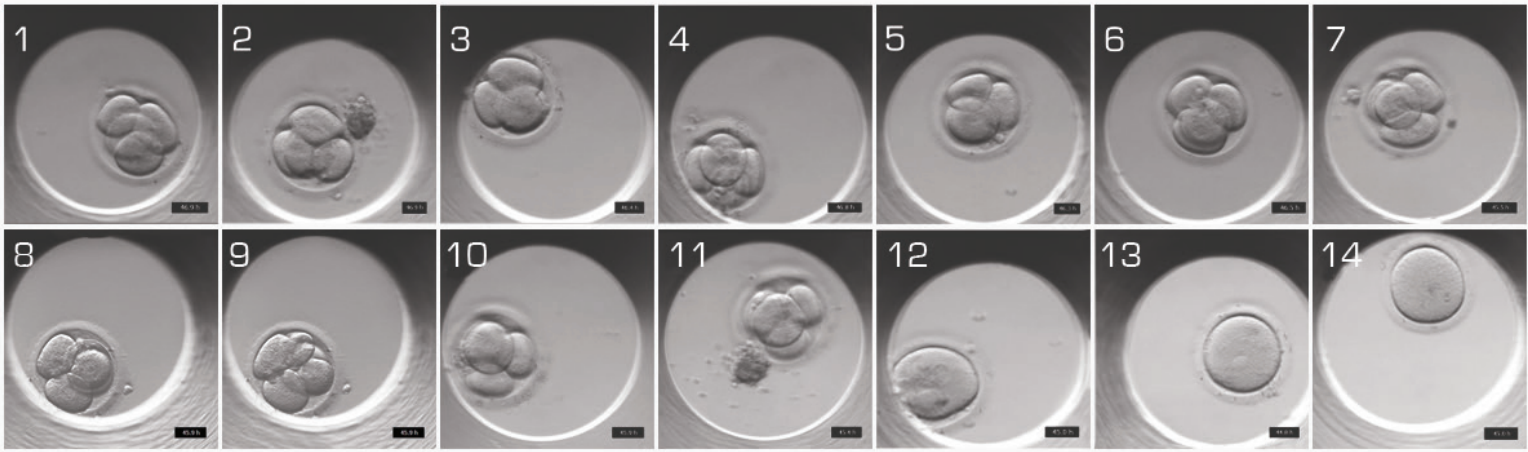
- Provides superior temperature stability.

2 Temperature Mode Options:

- Single: Uniform setpoints for all 6 (six) chambers
- Multi: Individual setpoints for each chamber

### Touch Screen Control Panel

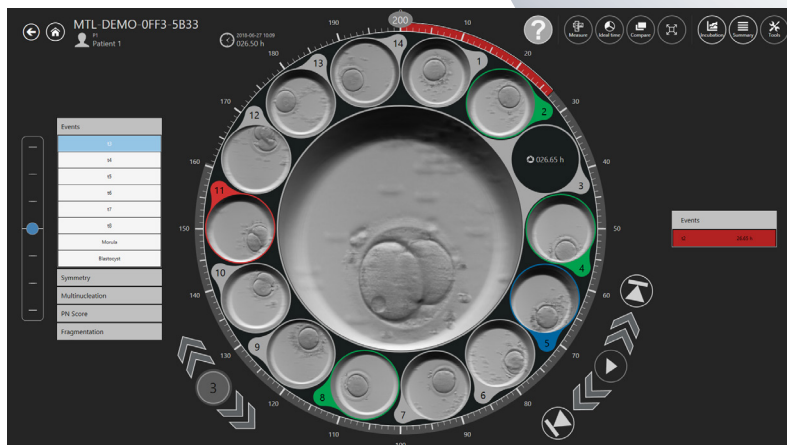
Easily change parameter settings with a reliable touch-screen display. Configuration is as simple as you need it to be.



## Watch Them Grow

The MIRI® TL can continuously capture Time-Lapse images of embryos as they develop using a built-in camera and a microscope. This enables users to make better-informed decisions about the embryos' outcomes.

## More Data – Better Selections



- Using the embryo evaluation tools on the Viewer station, only the highest-quality embryos can be selected.
- Retrospective data analysis offers a comprehensive documentation of patient details, treatment, and embryo data. This information can also be utilized for reference, sharing knowledge, and training embryologists.
- The embryologist can now easily measure, compare and observe the embryos from up close for better and more effective decision-making.
- Time-lapse technology allows for continuous monitoring of all embryos, ensuring that no important developmental events are missed.
- It enables the comparison of the actual timing of cleavages and stages, such as morula and blastocyst, with the ideal timing, helps to detect unusual cleavage patterns, such as direct and reverse cleavage, as well as assess the synchrony of divisions and multinucleation.
- The time-lapse session can run for up to 199 hours, and this measurement is included in the exported image and time-lapse report.

## Don't Miss Out on Crucial Events





## Time-Lapse Embryo Recording and Monitoring

The main screen shows all chambers as each counter illustrates the duration of Time-Lapse recording made. At the upper right portion, snapshots of other useful information regarding the incubator such as temperature, pH measurement, CO<sub>2</sub> and O<sub>2</sub> concentration, and Setpoints (SP) are displayed.

## CultureCoin<sup>®</sup>, a culture dish, exclusively designed for the MIRI<sup>®</sup> TL



One (1) MIRI<sup>®</sup> TL chamber can hold one (1) CultureCoin<sup>®</sup>. Each dish can accommodate up to fourteen (14) embryos, each with a numbered well assignment. The MIRI<sup>®</sup> TL6 can hold up to 84 embryos, and the MIRI<sup>®</sup> TL12 up to 168 embryos.

### Key Features

- Each embryo is cultured in its own stable environment.
- Ergonomic design for easy, safe, and secure handling of embryos.
- Independent well for pH measurements.
- Corona plasma treated surface for the effective prevention of bubble formation.
- Sterilized by gamma-irradiation

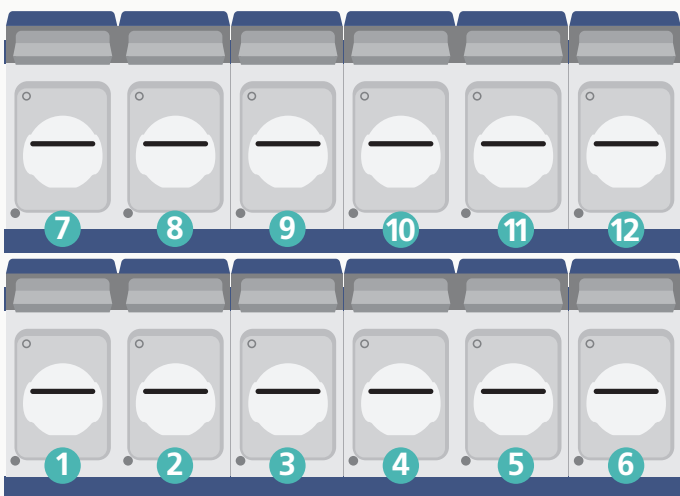






# Superior Incubation Environment

In MIRI® TL, separate chambers have been designed to prevent cross-contamination during the incubation process. The independent temperature regulation ensures optimal embryo developmental conditions. This significantly reduces disturbance and minimizes stressful factors that may be introduced when taking the dishes out of the incubator.

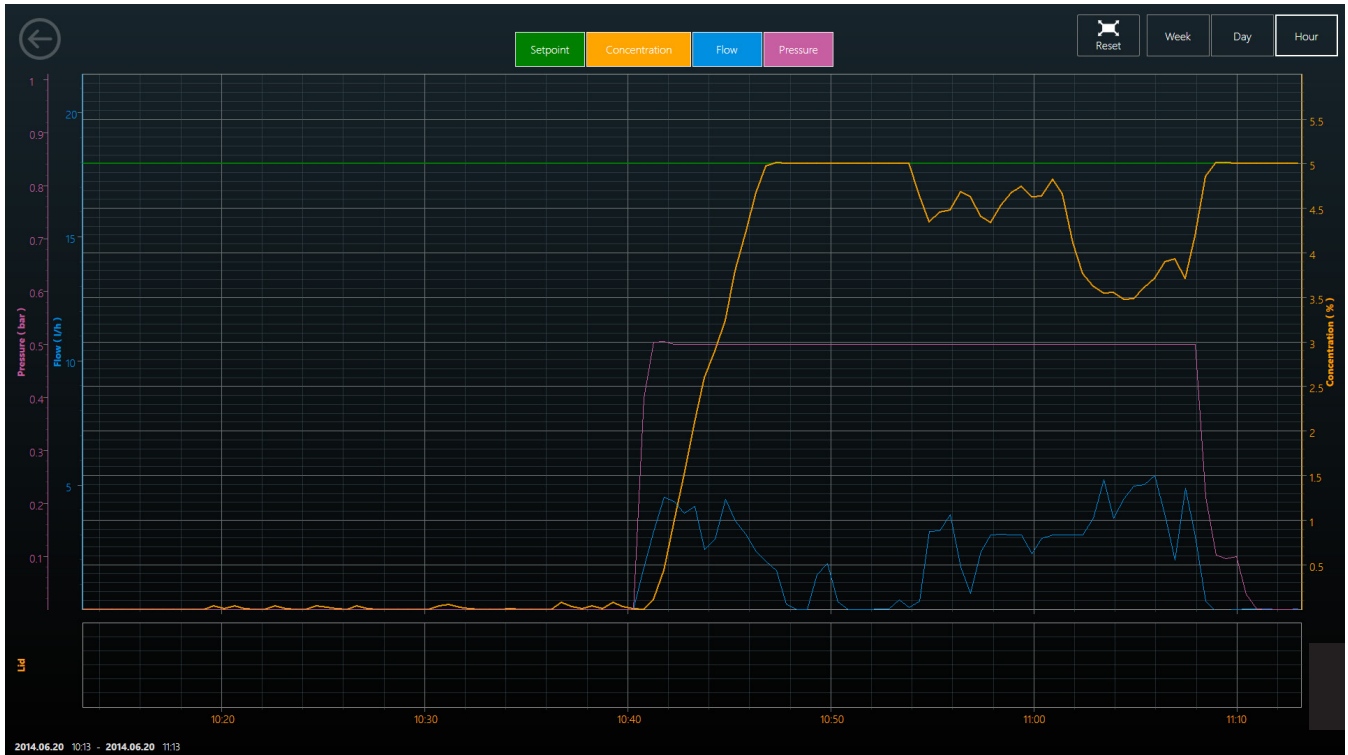


- Provides rapid temperature and gas recovery to ensure optimal environment stability.
- MIRI® TL multiroom IVF incubators do not support premixed gas.

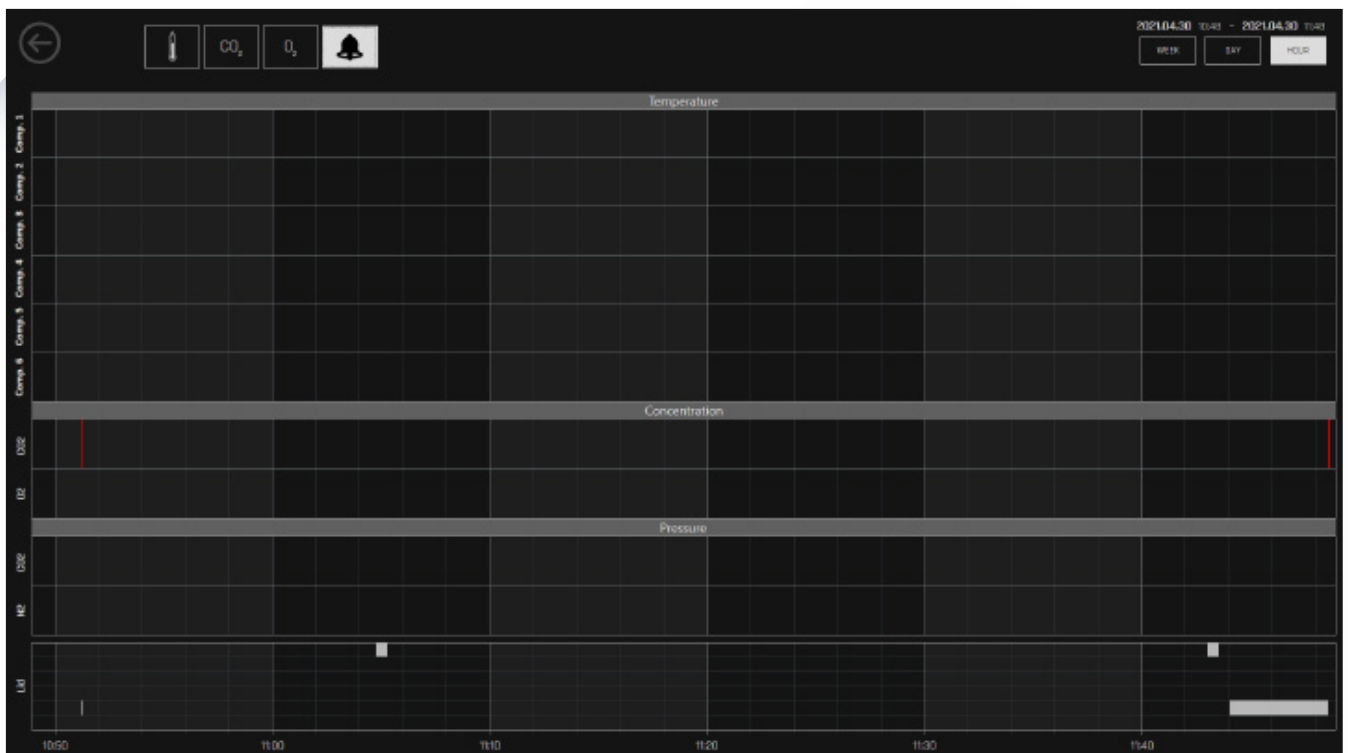
## Data and Alarms Logging

The MIRI<sup>®</sup> TL data logger continuously documents all incubation parameters such as flow, pressure, and concentration of CO<sub>2</sub>, O<sub>2</sub> and temperature regulation data. Details of any alarm events such as out-of-range parameters are also stored for retrieval.

You can also view similar performance data right on your MIRI<sup>®</sup> TL Viewer Software on a daily or weekly basis for all chambers. Data can also be easily printed for record keeping/audits.



The data logger stores continuous performance data of your device throughout its use. These are viewed in graph form.



Conditions that put the MIRI<sup>®</sup> TL into alarm state are recorded. It is also possible to configure the software to send email alerts.

# High Quality Environment for Optimum Embryo Growth

## Advanced CO<sub>2</sub> + O<sub>2</sub> Regulation

### Provides Total Control of the Gas Phase Environment

The built-in gas mixer and the high-performance CO<sub>2</sub> and O<sub>2</sub> sensors allow accurate control of gas phase composition in the chambers.

## High Quality Recirculated Airstream

### High Quality Airstream Via:

Volatile Organic Compounds or VOCs are toxic to an embryo. VOCs attach directly to DNA and this can be detrimental to embryo development. The MIRI<sup>®</sup> TL is specially equipped with VOC/HEPA filter to help eliminate harmful VOCs and particulates. A UV-C light (254 nm) sterilizes the airstream before passing through the filter.

## Easy Parameter Validation

### Quality Checking is easy!

Each chamber has an individual PT1000 sensor and gas sample port specifically designed for independent and continuous validation of temperature and gas concentration. The TL range can be connected to a MIRI<sup>®</sup> GA, a Gas and Temperature Validation unit, for continuous external validation of both gas and temperature.

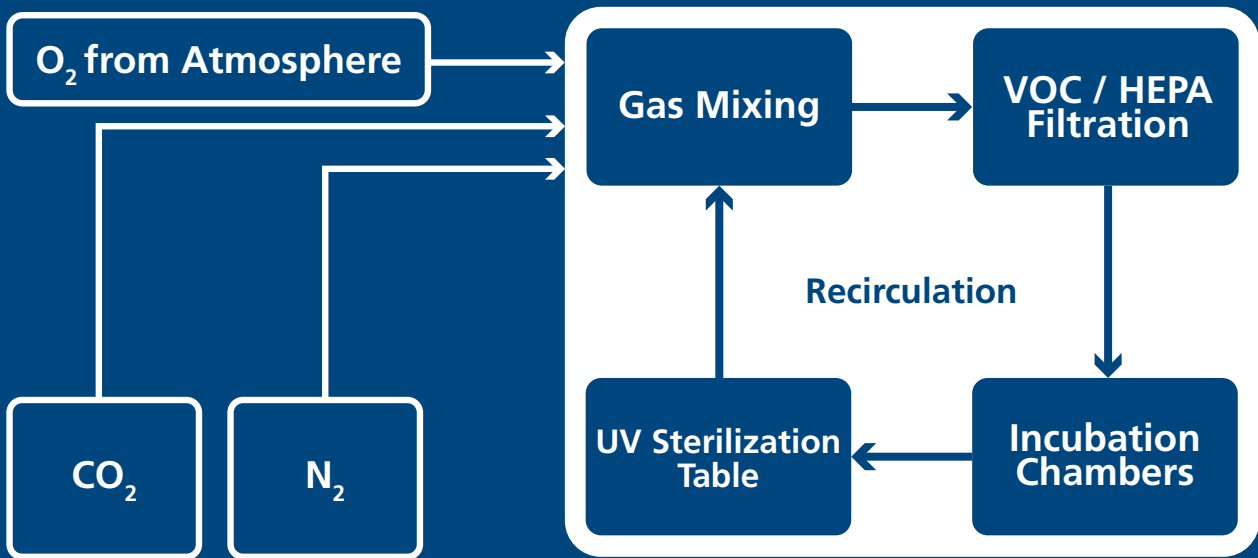
MIRI<sup>®</sup> TL have a built-in pH measuring system and pH well on the CultureCoin<sup>®</sup> dish can be used for easy checking of the pH in each chamber.



The VOC/HEPA Filter can be easily removed for replacement. No hassle. No downtime.



# Airflow Diagram



## Input Gases and Mixing

The MIRI® TL is a tri-gas system, which requires 100% CO<sub>2</sub>, 100% N<sub>2</sub> and atmospheric oxygen. The gases go through the built-in gas mixer, which regulates the concentration of CO<sub>2</sub> and O<sub>2</sub> in the culture chambers to the desired level. The gas levels are regulated according to the feedback loop from a NDIR CO<sub>2</sub> sensor and a medical grade chemical O<sub>2</sub> sensor. Nitrogen is infused to suppress the ambient O<sub>2</sub> level.



## VOC/HEPA Filtration

The gases then go through the VOC/HEPA filter, which effectively removes Volatile Organic Compounds (VOCs) and particulates larger than 0.3 µm.



## Incubation Chambers

The MIRI® TL features a recirculated gas system, whereby each of its chambers is constantly monitored for gas concentration and adjusted to the correct level. Gas is drawn from all the chambers and routed through a gas mixing chamber where the gas concentrations are adjusted to the setpoints.

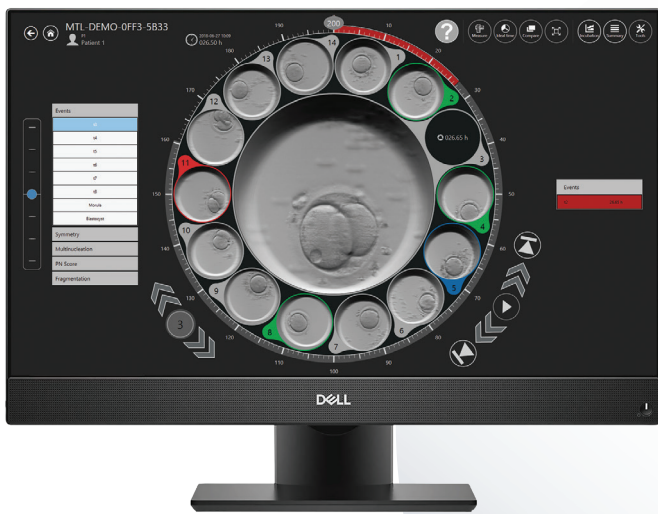


## UV Sterilization

The circulated gas is subjected to a 254nm UV light exposure after passing through the mixing chamber and VOC/HEPA filtration. The UV-C light contains light filters that inhibit the production of dangerous ozone. UV-C light may be toggled ON or OFF as required by the user.

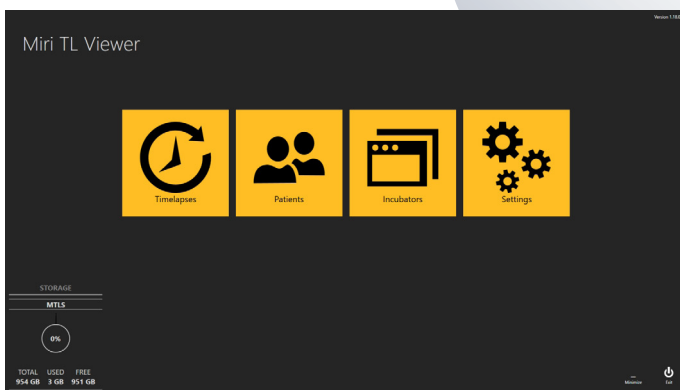


# Embryo Analysis and Evaluation System



## Simple and Intuitive

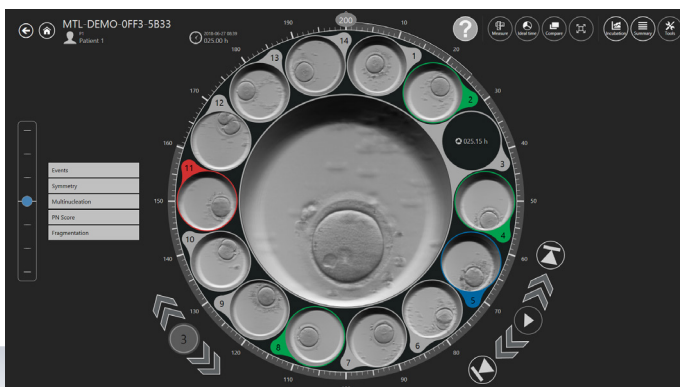
The MIRI® TL Viewer Software is a simple yet sophisticated and highly informative tool that can help embryologists process the data generated. You can review, annotate and compare the morphokinetic parameters of each embryo to select or deselect embryos for transfer while also allowing data export for retrospective analysis.



## Complete Data Logging System

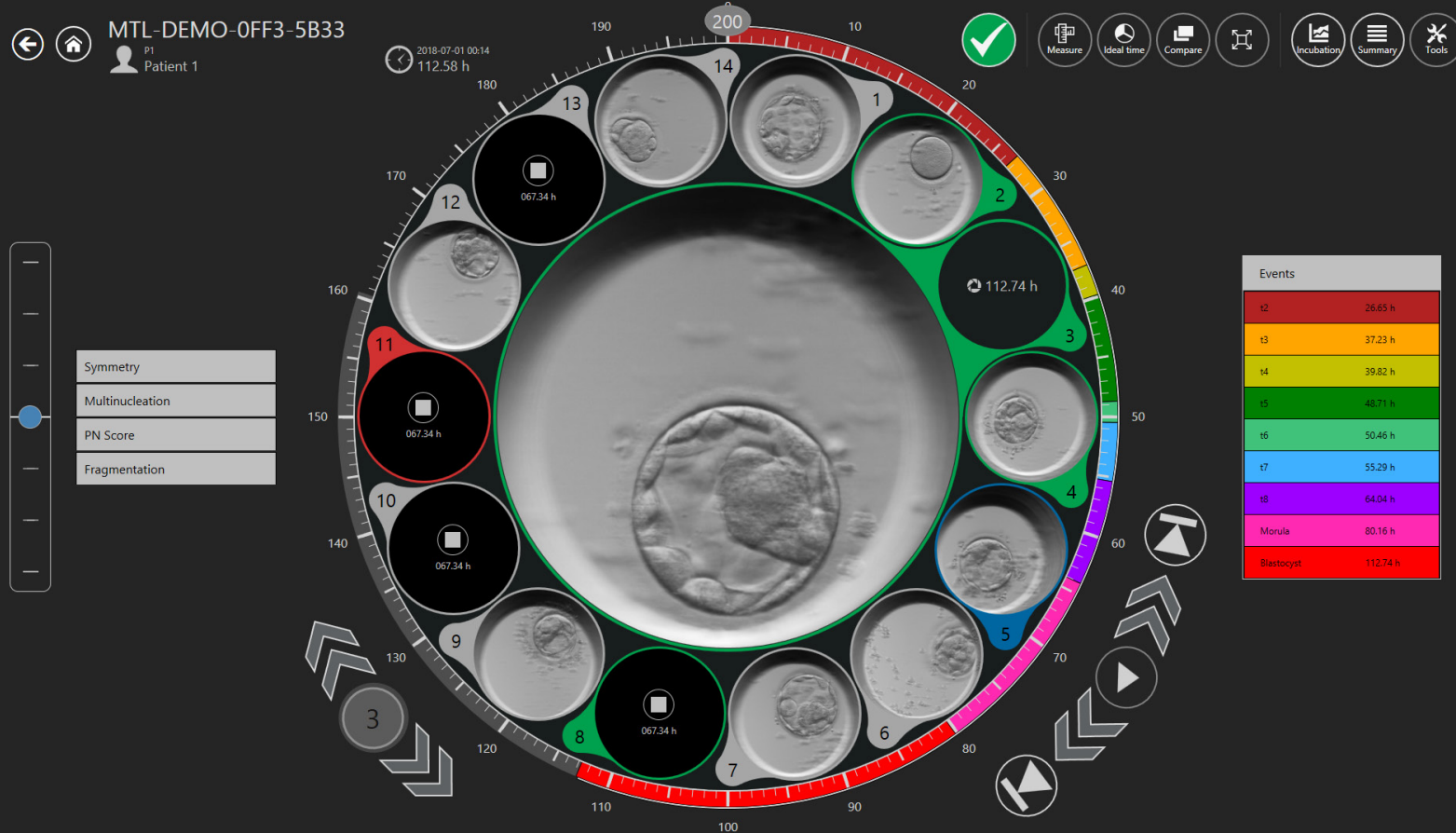
The main view shows four buttons:

- ▶ Time-Lapses (a list of pending, ongoing and past Time-Lapse sessions)
- ▶ Patients (Patient database)
- ▶ Incubators (view connected MIRI® TL Time-Lapse incubators)
- ▶ Settings (customize annotations, ideal timings, score models and more)



## Embryo Development Overview

Viewing embryo development has never been better. The Revolver View shows all embryos incubated within a CultureCoin®. This view is your starting point for annotation and selection. From here, you can choose an embryo to annotate and compare its development with other embryos in order to determine the most viable one.



## Sophisticated Tools for Annotation

Embryo annotation made easy! The annotation system is structured around the “events” that are located to the left of the wheel. Annotation is the process of time-marking a specific event/parameter e.g. if you’ve observed t2 happening at 27 hpi, you can click “t2” on the list of events from the left column and the annotated parameter of t2 at 27 hpi will be displayed in the right column. By default, the pre-programmed events list includes t2, t3, t4, t5, t6, t7, t8, morula, blastocyst and early blastocyst.

The sophisticated software gives the user the ability to customize each event completely. The events listed in the left column can be customized to include other parameters not programmed in the default settings. You can go to Settings where you can find more advanced parameters that can be included in your Time-Lapse grading system. To complement these features, we have added the Ideal Time function, in the form of a circular coloured band on the edge of the annotated events. This indicates their ideal timings, making it easier to compare the actual timing of the embryo development with the ideal.







## Side-by-Side Comparison

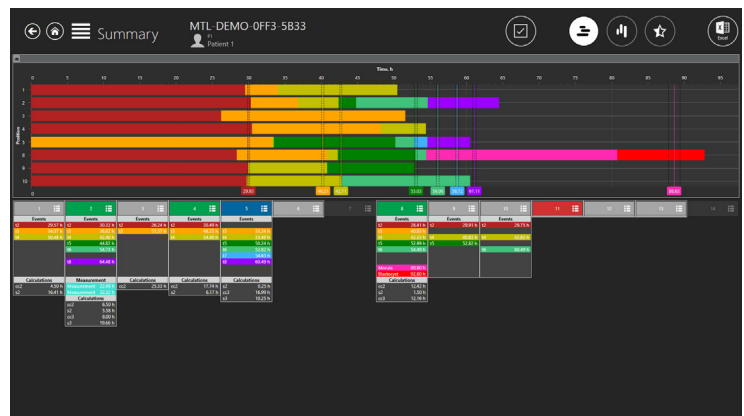
Choosing the most viable embryo for transfer is made easier with the **Compare Tool**. It allows you to make a side-by-side comparison of the embryo development and offers you the flexibility to choose the specific time point you would like to compare. The events annotations are in alignment for comparison, but measurements and calculations are listed normally.

## Easy to Understand Summary View

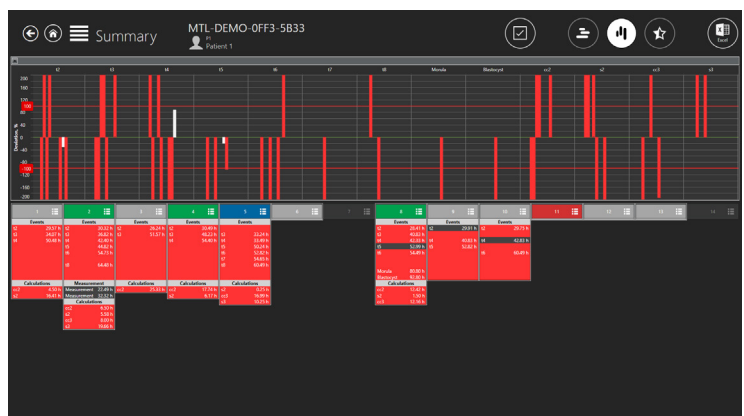
The **Summary View** is a helpful tool in comparing and selecting the most viable embryo based on the annotations made. The Horizontal View allows you to compare the actual cleavage timings of all embryos against the ideal timing.

There is an option wherein the embryologist can select or deselect the dish position one desires to view by clicking the “checkmark” in the summary view.

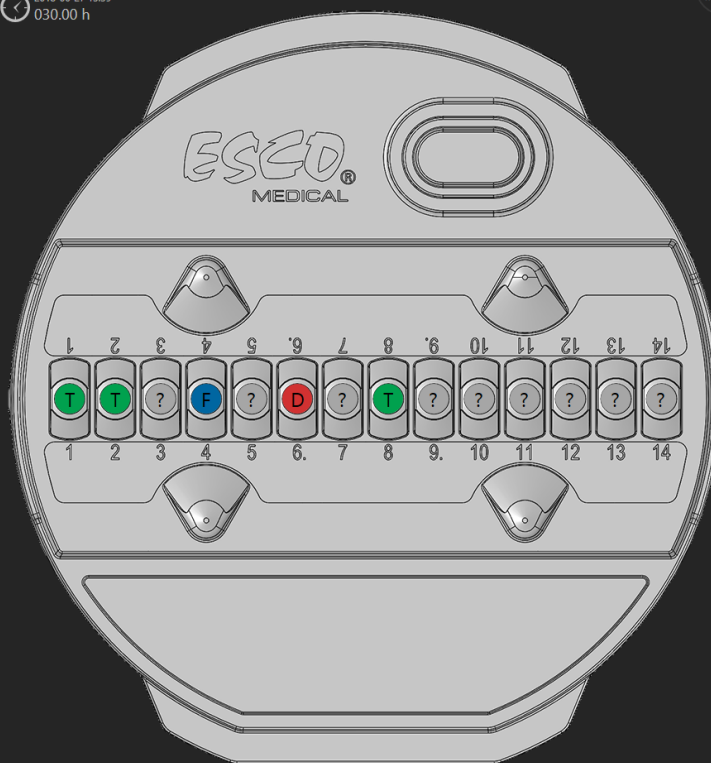
The Vertical View is an efficient way of identifying cleavage timings that are within or out of predetermined criteria (range). The white bar indicates timings within acceptable parameters while the red bar indicates those outside acceptable criteria.



Horizontal View



Vertical View



Once the evaluation and comparison are complete, the embryos can be assigned colours that indicate their outcome:

A coloured ring will appear around the embryo well and the colour on the dish map will change accordingly.

|  |                     |  |               |
|--|---------------------|--|---------------|
|  | White - No Decision |  | Blue - Freeze |
|  | Green - Transfer    |  | Red - Discard |

## Freedom to Personalize

**Our belief is that as the customer, the device belongs to you.** Therefore, it should offer you the freedom to customize and adjust the instrument and parameter settings completely. The "Ideal Time" function and Events for the annotation can be optimized based on the requirements of your clinic.

## Additional Features

### 1. Additional embryo states

The dedicated menu allows you to fully customize and/or create additional embryo states. After being created, new embryo states are visible near the default ones on the timelapse view screen and the Dish Map menu.

### 2. Score models

Utilising the integrated score model functionality makes it easier to decide on the embryos' viability. Hierarchical and weighted score models provide precise results based on the model created at a moment's notice. These results can also be included in the report.

### 3. Keyboard shortcuts

Newly introduced keyboard shortcuts help to make the everyday work of an embryologist more efficient while using the Viewer Software. A dedicated menu enables the user to fully customize the shortcuts depending on personal needs.

# Monitor the MIRI<sup>®</sup> TL Incubator



## MIRI<sup>®</sup> TL Viewer

The MIRI<sup>®</sup> TL Viewer is a specialized software platform that gives you the capability to visualize, compare (side-by-side), annotate and store the embryo development images coming from the MIRI<sup>®</sup> TL incubator. The logging software shows incubator status and provides you with the option to send e-mail alarms. At the same time, the MIRI<sup>®</sup> TL Viewer also serves as a video player for the Time-Lapse videos generated by the MIRI<sup>®</sup> TL incubator.

## MIRI<sup>®</sup> TL Server

The MIRI<sup>®</sup> TL Server provides you with secure and high capacity storage of your TL data.



## MIRI<sup>®</sup> TL Viewer Specifications

| CPU              |   |
|------------------|---|
| CPU Model        | Intel <sup>®</sup> Core <sup>™</sup> i7-13700 |
| CPU Architecture | 64-bit  |
| CPU Frequency    | 8-core, up to 5.1 GHz                         |
| Memory           |   |
| Installed Memory | 1 x 8 GB                                      |
| Memory Type      | DDR5-4800 MHz non-ECC                         |
| Storage          |   |
| Installed        | 1x 256GB, 1x 1TB                              |
| Storage Type     | M.2 PCIe NVMe SSD                             |

| Operating System       |   |
|------------------------|---|
| Manufacturer           | Microsoft   |
| Name                   | Windows 11 Pro  |
| External Ports         |   |
| RJ-45 LAN Port         | 1x rear   |
| USB 3.1 Type A Gen 1   | 4x rear, 1x side (with PowerShare)                            |
| USB 3.1 Type C Gen 2   | 1x side   |
| Audio                  | 1x Line-Out (rear), 1x Universal Audio Jack (side)            |
| Video                  | 1x HDMI In, 1x HDMI Out, 1x DisplayPort Out, 1x USB-C (DP1.2) |
| Card Reader            | microSDXC card slot   |
| Additional Information |   |
| Display                | OptiPlex All-in-One Non-Touch 23.8" FHD Panel                 |
| Wireless Connections   | Realtek 8853BE Wi-Fi 6, Bluetooth                             |

## MIRI<sup>®</sup> TL Server Specifications

|                             |   |
|-----------------------------|---|
| Database Storage            | AMD Ryzen V1500B, 4GB DDR4, 2x 10TB HDD (RAID1) / 1x 500GB SSD                                      |
| MIRI <sup>®</sup> TL Server | Intel <sup>®</sup> Core <sup>™</sup> i5-10210U, 8GB DDR4, 1x 256GB M.2 NVMe SSD, Windows 10 Pro x64 |
| Network Switch              | 16 port, Gigabit Ethernet   |



# General Specifications

## MIRI® Time-Lapse IVF Incubators

| Specifications                    | TL6  | TL12                                     |
|-----------------------------------|--|--|
| Overall Dimensions                | 805 x 590 x 375 mm (31.7 x 23.2 x 14.8")   | 950 x 685 x 375 mm (37.4 x 27.0 x 14.8") |
| Chamber Dimensions                | 120 x 90 x 26 mm (4.7 x 3.5 x 1")  |  |
| Weight                            | 60 kg  | 93 kg                                    |
| Temperature Control Range         | 28.7 - 41.0 °C   |  |
| Power Consumption                 | 330 W  | 650 W                                    |
| * CO <sub>2</sub> Gas Consumption | < 2 L/h  |  |
| **N <sub>2</sub> Gas Consumption  | < 5 L/h  |  |
| CO <sub>2</sub> Control Range     | 2.9% - 9.9%  |  |
| O <sub>2</sub> Control Range      | 2.0% - 20.0%   | 5.0% - 20.0%                             |
| Input Gas Pressure                | 0.4 - 0.6 bar (5.80 - 8.70 PSI)  |  |
| Built-in Microscope               | Zeiss 20x, objective has numerical aperture of 0.35, specialized for 640 nm illumination |  |
| Embryo Illumination               | 0.064s per image, using 1W single red LED (635nm)  |  |
| Camera Resolution                 | 1280 x 1024. Monochrome, 8-bit, IDS system   |  |
| Optics Tube Ratio                 | 2.22 px/μm   |  |
| Imaging Focal Planes              | 5, 10 and 20 min intervals in 3, 5 and 7 focal planes                                    |  |

\* Under normal condition (CO<sub>2</sub> setpoint reached at 6.0%, all lids closed).

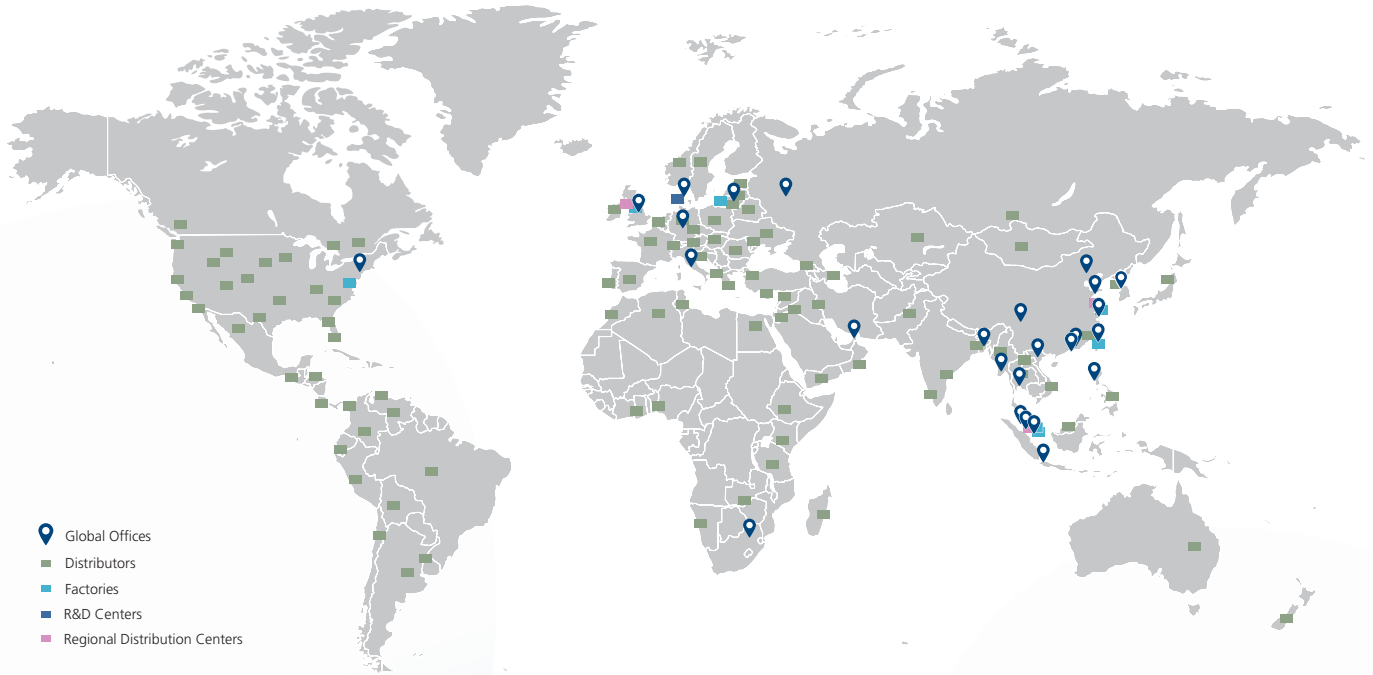
\*\* Under normal condition (O<sub>2</sub> setpoint reached at 5.0%, all lids closed).






## Ordering Information

| MIRI® Time-Lapse Incubator |                |  |
|----------------------------|----------------|--|
| Item Code                  | Model Code     | Description  |
| Device                     |                |  |
| 2070091                    | MRI-TL-MN-6C-8 | MIRI® Time-Lapse Incubator, Mini, 6 Chambers, 230 V, 50/60 Hz                        |
| 2070092                    | MRI-TL-MN-6C-9 | MIRI® Time-Lapse Incubator, Mini, 6 Chambers, 115 V, 50/60 Hz                        |
| 2070100                    | MRI-TL-12C-8   | MIRI® Time-Lapse Incubator, 12 Chambers, 230 V, 50/60 Hz                             |
| 2070101                    | MRI-TL-12C-9   | MIRI® Time-Lapse Incubator, 12 Chambers, 115 V, 50/60 Hz                             |
| Accessories                |                |  |
| 1320011                    | MRA-1007       | VOC/HEPA filter (recommended to be changed every 3 months)                           |
| 1320088                    | MRI-CC         | CultureCoin® for Time-Lapse of 14 embryos (25 pcs. per pack)                         |
| 1320045                    | MRI-GA         | MIRI® GA CO <sub>2</sub> / O <sub>2</sub> & Temperature Validation Unit, 115V / 230V |

| MIRI® TL Viewer and Server |            |                         |
|----------------------------|------------|-------------------------|
| Item Code                  | Model Code | Description             |
| 2070042                    | MRI-VIEWER | MIRI® Time-Lapse Viewer |
| 1320095                    | MRI-SERVER | MIRI® Time-Lapse Server |

# ESCO LIFESCIENCES GROUP



-  Global Offices
-  Distributors
-  Factories
-  R&D Centers
-  Regional Distribution Centers

## Esco Medical Products:

MIRI® Multiroom Incubator  
 MIRI® Humidity Multiroom Incubator  
 MIRI® II-12 Multiroom Incubator  
 Mini MIRI® Dry Multiroom Incubator  
 Mini MIRI® Humidity Multiroom Incubator

MIRI® TL6 Time-Lapse Incubator  
 MIRI® TL12 Time-Lapse Incubator  
 Multi-Zone ART Workstation  
 MIRI® Laminar Flow Cabinet  
 MIRI® Evidence RFID Witnessing & Traceability System

CelCulture® CO<sub>2</sub> Incubator  
 MIRI® GA (Gas and Temperature Validation Unit)  
 MIRI® AVT  
 CultureCoin®

*Infertility is a problem that has a significant social, psychological, and economic impact on afflicted individuals and couples. It is a global concern that knows no race or creed. It has been estimated that 1 in 6 couples struggle with infertility at least once in their lifetime.*

*Esco Medical is one of the divisions of the Esco Lifesciences Group. We provide innovative technological solutions for fertility clinics and laboratories. We aim to become the leading manufacturer of high-quality equipment such as long-term embryo incubators, ART workstations, anti-vibration tables, and time-lapse incubators.*

*Our products are designed with the Silent Embryo Hypothesis as a guiding principle. The Silent Embryo Hypothesis states that the less disturbed an embryo can remain, the better its developmental potential will be. Most of our products are designed in Denmark and made in the EU. Our primary focus is to increase pregnancy success rates and patient satisfaction.*



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